Safeguarding EU policy aims and requirements in smart grid standardization

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The EU electricity market is changing. We are leaving a decade of liberalization and enter a period in which the sustainability of the system and consumer participation play a more significant role. The application of ICT technology, especially by way of smart grids, is presumed to support these roles.

Smart grids may change the face of the energy systems in the EU. They potentially contribute to reducing CO2 emissions, empower consumers and make markets more competitive. However, to what extent smart grids will contribute to these aims depends on how their technology is developed. In turn, standardization largely influences the development of their technology.

This study investigates the issue of safeguarding policy aims and requirements in the standardization process of smart grids. How can the EU aims and requirements for smart grids be safeguarded in this standardization process?

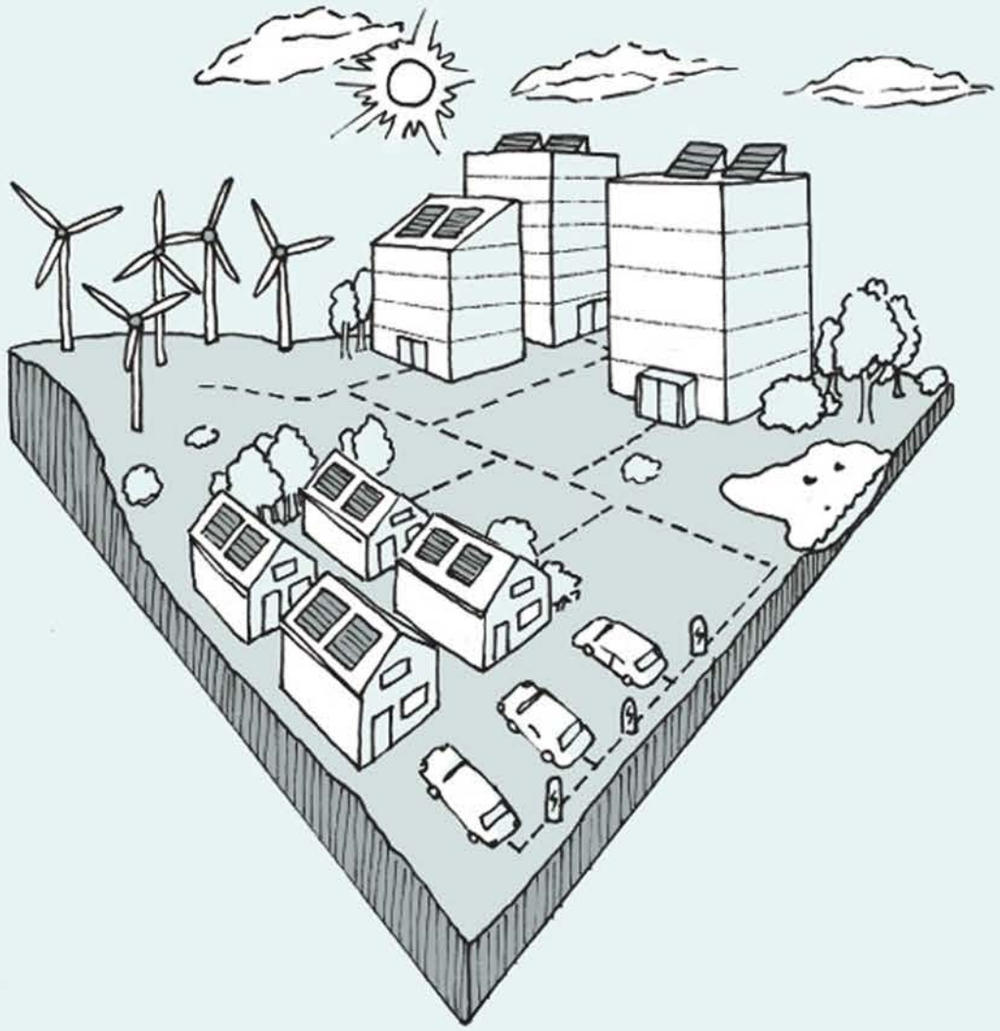
To establish the existing safeguards, this thesis first addresses the current legal framework of EU standardization and its consequences for the standardization process of smart grids. It subsequently investigates the important role of standards in society and shows that additional safeguards are crucial to ensure the incorporation of EU aims and requirements in the standardization process.

The thesis first and foremost brings to light the responsibility of the EU Commission to clarify its aims and requirements in the standardization mandate. Secondly, it proposes the application of the EU principles of good governance as procedural safeguards in the process. Finally, it discusses the possibilities and implications of their application to standardization.

Safeguarding EU Policy Aims and Requirements in Smart Grid Standarization

Robin Hoenkamp

Safeguarding EU Policy Aims and Requirements in Smart Grid Standardization



Robin Hoenkamp

SAFEGUARDING EU POLICY AIMS AND REQUIREMENTS IN SMART GRID STANDARDIZATION

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By Robin Hoenkamp

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Preface

Being able to write a PhD thesis is, without doubt, a privilege and I was very lucky to get this opportunity. It is process with great freedom, a perfect way to improve writing skills, and a great place to learn on an intellectual as well as a personal level. Nonetheless, I will not be the first to admit that it is also a hard process. Looking back, I had absolutely no clue what I got myself into when I started. My main motivation to do this research was the prospects of smart grids to reduce the impact of the energy market on our planet. Being able to contribute to that prospect by doing this research, if even in a microscopic way, has remained the driving source during the whole process. That being said, my slightly naïve trust in smart grids to save our planet when I started, evolved into a concern that it might just turn out to be an empty buzzword.

The possibilities that technological developments have brought in the last decade are tremendous. During my research I benefited greatly from these technological innovations. For one, I cannot even imagine how previous generations of researchers were able to find relevant information without the help of the World Wide Web. Also cloud computing made it possible for me to work from any location without needing to bring my thesis physically with me. I rarely lost any of my writing due to these sophisticated programs that stored my papers. Even going to work and leaving my baby at home was much easier when I received videos of him giggling away in our house.

Where twenty years ago the Internet was referred to as Cyberspace, it now seems ridiculous to refer to it as a separate space. For most of us it is actually the main means of communication with our friends and it is also starting to make its way into our physical environment.

Smart grids are one of these areas where ICT is entering the physical domain. In the past decade they have brought great benefits. They can boost the transition to more renewable energy and provide us consumers with a stronger position in the energy market. There is however also a salient threat in these developments. The parties developing these technologies do not necessarily have our, or society's, best interests at heart. There have been for instance numerous cases of serious privacy infringements on users of communication technology. Moreover, reports of human rights violations on factory workers that develop our smart phones and tablets keep surfacing.

In standardization processes companies that develop products and services come together to work out solutions that are meant to make it easier to bring their products on the market. The standardization process thus functions as a platform

for the necessary agreements between companies. And indeed, what better place is there than the standardization process to ensure that the interests of consumers and the transition to more renewable energy are taken into account? Unfortunately policymakers do not see it this way. EU officials often have non-technical backgrounds and for them technological innovations are such a different world that they are more than happy to leave the technical experts to their business. Nonetheless, after standards are already developed and implemented these policy makers can be faced with standards that do not optimally incorporate the legal- and policy framework.

On the other hand, the engineers developing technology are not really waiting for more complications caused by regulation. Involved in a pilot project concerning smart grids, I once was asked to figure out what the EU needed to change in their regulation to make the concerning smart grid projects possible. Objectively, this might have been an innocent enough question. At that moment I did not know how to respond. In my 'lawyer mind' I was screaming, "*Are you serious? Just change EU law to fit your situation? What a ridiculous assignment are you giving me?*" It makes sense that engineers in their enthusiasm to solve a problem are not too worried about the legal framework. I would be the last to suggest that it is the participants responsibility to know the applicable law, let alone the concerning policy aims the EU has for their technology. However, because of this instrumental approach, legal values can be diminished.

It is the responsibility of the EU Commission (who assigns the task of standardization) to ensure that the relevant values and legal requirements are upheld.

This could seem rather obvious, but it is not. In this book I will explain the complications and possible solutions.

Contents

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Abbreviations

ACER	Agency for the Cooperation of Energy Regulators
CA	Copyright Act
CAS	Central Access Server
CE	Conformité Européenne
CEN	Comité Européen de Normalisation
CENELEC	Comité Européen de Normalisation Électrotechnique
CIM	Common Information Model
DRAM	Dynamic Random Access Memory
DRM	Digital Rights Management
DSMR	Dutch Smart Meter Requirements
DSO	Distribution System Operator
DVWG	Deutsche Vereinigung des Gas- und Wasserfaches
ECHR	European Convention on Human Rights
ECJ	European Court of Justice
EFTA	European Free Trade Association
EME	Encrypted Media Extension
EN	European Standard (Norm Européenne)
ESCO	Energy Service Company
ESO	European Standardization Organization
ETSI	European Telecommunications Standards Institute
EU	European Union
FRAND	Fair, Reasonable and Non-discriminatory
ICANN	Internet Corporation for Assigned Names and Numbers
ICT	Information Communication Technology
IETF	Internet Engineering Task Force
IP	Internet Protocol
IPR	Intellectual Property Rights
ISOC	Information Society
ISP	Internet Service Provider
MID	Measuring Instruments Directive
MS	Microsoft
NLF	New Legislative Framework
NRA	National Regulatory Authority
NSB	National Standardization Body
NTA	Nederlandse Technische Afspraak

OJ	Official Journal of the European Union
PA	Publication Act
SBCCI	Southern Building Code Congress International
SEP	Standard Essential Patent
SG-CG	Smart Grid- Coordination Group
SGAM	Smart Grid Architecture Model
SM-CG	Smart Meter- Coordination Group
SME	Small and Medium-sized Enterprise
SQ	Subquestion
TACD	Transatlantic Consumer Dialogue
TBT	Technical Barriers to Trade
TCP	Transmission Control Protocol
TFEU	Treaty on the Functioning of the European Union
WSIS	World Summit on the Information Society
WTO	World Trade Organization

1 Introduction

In this introduction, we will explain the research questions, the structure, and the scientific relevance of this research.
In short, standards determine important aspects of our lives and society. Because standards play a crucial role in smart grid development in the European Union (EU), it is important that legal safeguards exist to ensure that these standards contribute to the aims and requirements of smart grids. However, no such safeguards exist at this time.

1.1 Standardization at the center of smart grid decisions

In this section, we will discuss what standards are, how they operate in existing technologies and what role they play in smart grids.

1.1.1 The problem at hand

Over the last several decades, technological development has opened countless possibilities, of which most people could never have dreamed. The wide availability of these technologies has generally improved our quality of life. We can enjoy the availability of an almost endless information source through the Internet, applications such as navigation programs telling us where to go, e-mail and video calling. Not only do we like these technologies, we have become quite dependent on them.
Most people would have a hard time making appointments with others without the use of their smart phones. Operating without smart phones seems like a different world to the younger generation. The hassle of figuring out where and when to take a particular bus, determining which direction to then walk in, and, above all, being unable to let the other person know if one gets lost and will be late. No more than 10 years ago, this hassle was simply how we did things. It is thus clear that technological development has made most people's lives much easier in a short period of time.
Technology is increasingly built into society to make life more comfortable. There is a trend toward building smart cities, in which smart grids are usually considered an element. These smart cities are made 'smart' by adding information communication technology (ICT) to existing infrastructure. There are also completely new smart cities developed from scratch, not by governments, but by companies that envision great business for them. An example is the private real estate undertaking of the city of Songdo, South Korea. This city is being built from scratch, making maximal use of digital technology for education, energy, water conservation, transportation and several other aspects. In this city, Cisco provides the necessary ICT infrastructure on which all of

these services will depend. They are the exclusive provider of 'digital plumbing'. From conference calls to waste processing, Cisco provides the infrastructure.

Alongside the significant advantages of using new technologies, there is a worrisome issue that relates to the problem statement of this research. When designing a new technology, the engineer is faced with several decisions. These decisions involve which possibilities to include, the restrictions that the technology imposes, or, for example, how the interfaces should work. These choices are not really significant when they concern colors or shapes; however, when they affect more delicate issues (e.g., privacy or environmental impact), the decisions can have major consequences for society.[1]

Whenever interaction occurs, standards are part of our everyday technologies. A standard for navigation is the global positioning system (GPS). The GPS standard is a US standard that offers a uniform way to determine positions, using satellite connection. The standard provides an extra broadcast frequency, which allows military use to be considerably more accurate than civilian use.[2] Therefore, the standard does not allow the civilian user to take advantage of all of the options that the technology potentially has to offer.

In designing technology, the developer makes choices about the possibilities and impossibilities of technology. If you do not like the consequences of those decisions, you can potentially use a different service that better suits your needs. Market mechanisms let you choose another technology provider that suits your preferences better, provided such a provider exists, of course. For instance, while some people use advertisement blockers, others choose to use search engines that work anonymously to circumvent targeted advertising and targeted search results. However, in regard to standardization, such variations in technology can become restricted. This issue is central to this research; standardization decisions affect not only your interests as a user but also more general interests, such as environmental protection. Standards can, for example, contain descriptions of the materials used. If the decision on what materials are allowed does not consider the environmental impact of materials, these decisions will ultimately influence how environmental friendly products are. The same is true, for instance, for the level of products' energy efficiency.

1.1.2 Smart grids in Europe

In this research, we specifically address the European smart grid standardization that is based on the European Commission's request for European Standardization Organizations (ESOs) to develop standards.

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[1] Douglas, D., et. al (2009) *Citizen Engineer: A handbook for socially responsible engineering*, Crawfordsville Indiana: Pearson Education, provides great examples of the impact of technological decisions on society.

[2] GPS Acuracy, Retrieved on 3 February 2014: http://www.gps.gov/systems/gps/performance/accuracy/

1.1.2.1 *What is a smart grid?*

The smart grid is currently an important technological development in which standardization plays a crucial role. While the grid of our energy supply system has been organized in the same way for almost a century, we are currently at a stage in which ICT applied to the electricity grids[3] will make the energy distribution smarter by means of the so-called smart grids.

A smart grid does not have just one definition. Some definitions only address the added communication layer[4] or describe aspects of integrating user behavior, economic efficiency, sustainability and quality as well[5], while others emphasize its modernization and new functionalities[6], or include the technical components of the grid[7]. Aside from numerous definitions, there exists a wide range of functions of the smart grid. Some regard it as a solution for the ageing electricity grid to avoid adding extra capacity[8], while others view it as an enabler of renewable energy systems[9], still others make clear distinctions between internal market, security of supply and environmental protection as drivers for smart grids[10]. Moreover, smart grids are viewed as necessary for certain energy market developments, such as the integration of electric vehicles[11] or for a stronger role of the consumer[12]. Because the smart grid standardization request of the European Commission (the Commission) is the topic of this research, we use its definition of the smart grid, as outlined in its standardization request:

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[3] Smart grids are also relevant to gas and district heating systems, this research is limited to smart electricity grids.

[4] Commission Recommendation on preparation for roll-out of smart metering systems, Official Journal of the European Union (OJ) 2012 L 73, p.11.

[5] EU Commission Task Force for Smart Grids, Expert group 1, functionalities of Smart Grids and Smart Meters, December 2010, p.6, retrieved 18 December 2014: http://ec.europa.eu/energy/gas_electricity/smartgrids/doc/expert_group1.pdf.

[6] NIST Framework and Roadmap for Smart Grid Interoperability Standards, Release 2.0 retrieved 21 November 2014: http://www.nist.gov/smartgrid/upload/NIST_Framework_Release_2-0_corr.pdf

[7] Ghafurian, R. (2011) Smart grid: The electric energy system of the future, *Proceedings of the IEEE*, 99(6), p. 918.

[8] Gungor, V., e t al. (2011) Smart grid technologies: communication technologies and standards , *IEEE transactions on Industrial informatics*, *7*(4) or Momoh, J. A. (2009 15-18 March), *Smart grid design for efficient and flexible power networks operation and control*, presented at IEEE Power Systems Conference and Exposition.

[9] Potter, C. , et al., (2009 15-18 March), *Building a smarter smart grid through better renewable energy information*, presented at Power Systems Conference and Exposition, or Liserre, M., et al., (2010) Future energy systems: Integrating renewable energy sources into the smart power grid through industrial electronics *Industrial Electronics Magazine, IEEE*, 4(1).

[10] Europe European Technology Platform on SmartGrids, Vision and Strategy for Europe's Electricity Networks of the Future, publication EUR 22040, D-G research sustainable energy systems, 2006, retrieved on 5 December 2014: http://ec.europa.eu/research/energy/pdf/smartgrids_en.pdf

[11] Kabisch, S., et al. (4-6 Oct. 2010) *Interconnections and communications of electric vehicles and smart grids*, presented at 2010 First IEEE International Conference on Smart Grid Communications (SmartGridComm).

[12] Grijalva, S., & Tariq, M. (2011, 1-3 Dec.). *Prosumer-based smart grid architecture enables a flat, sustainable electricity industry,* presented at IEEE Innovative Smart Grid Technologies (ISGT).

> "A Smart Grid is an electricity network that can cost efficiently integrate the behaviour and actions of all users connected to it – generators, consumers and those that do both – in order to ensure economically efficient, sustainable power system with low losses and high levels of quality and security of supply and safety."[13]

All of these smart grid aims are direct or indirect expressions of EU energy policy aims of ensuring the functioning of the energy market, ensuring security of supply, the integration of renewable energy and energy efficiency, and the interconnection of networks as laid down in art. 194 of the Treaty on the Functioning of the European Union.[14]

In essence, with the help of ICT, detailed information about electricity supply and demand can be gathered so that the supply of electricity can be better matched with the demand. Such detailed information is especially expedient in combination with intermittent renewable energy sources (e.g. sun and wind). The supply of these sources is, after all, not to be controlled. Along with growing energy efficiency and the transition towards renewable energy sources, this technology can contribute greatly to the EU carbon emission reduction aims.[15] Its development leads to change in which two separate worlds, the energy market and information technology, intertwine.

1.1.2.2 European smart grid standardization

The need for standards in this field is high because of the different aspects, different possibilities, and the need for participants (e.g., consumers, suppliers and operators) to communicate on the smart grid. Without standards first-movers stand the risk to fall by the wayside when their technology turns out to be incompatible.

The development of standards for smart meters and smart grids is a high priority on the European agenda.[16] Potential smart grid investors are struggling to find the optimal model for sharing costs and benefits along the value chain. The absence of adequate standards is an uncertainty that keeps market participants from investing, which is precisely why the Commission issued a standardization mandate for smart grids.[17] In this mandate, the Commission requests that ESOs set relevant standards for smart grids. The

[13] Standardization Mandate to European Standardisation Organisations (ESOs) to support European Smart Grid deployment, Brussels 1st March 2011 M/490, p. 2 footnote.
[14] The Treaty on the Functioning of the European Union, OJ 2012 C326.
[15] E.g. EG3 First year report: Options on handling smart grids data, January 2013, p. 4, retrieved on 4 August 14: http://ec.europa.eu/energy/gas_electricity/smartgrids/doc/xpert_group3_first_year_report.pdf. In Chapter 5 we will elaborate on the specific policy objectives for smart grids.
[16] Communication for the Commission: A Digital Agenda for Europe, COM(2010)245.
[17] Standardization Mandate to European Standardisation Organisations (ESOs) to support European Smart Grid deployment, Brussels 1st March 2011 M/490.

purpose of this standardization mandate is interoperability[18]. The mandate requests that standardization address several technical domains, such as communication standards, cyber security and data protection. Standardization work is not limited to the domains mentioned in the mandate. At the end of 2014, ESOs had identified approximately 2,500 standards that are relevant for smart grids; most of these standards relate to telecommunications, advanced metering systems, aggregated prosumer management systems, and electromagnetic compatibility, but they also cover other areas, such as substation automation, e-mobility, and security[19]

1.1.2.3 Smart grids in context

Energy infrastructure provides people with access to basic human needs (e.g., cooking, health, and communication). Access to energy is important in ensuring social and territorial cohesion, economic stability and sustainable development.[20] Historically, energy has been viewed as a public service in most developed countries.[21] Because of people's basic need for energy, its supply and distribution was thought to be best organized centrally, by the government or under strict governmental rules. Centrally organized electricity supply implies that electricity is produced at a limited number of power plants and distributed to users at the endpoints. In recent years, the self-evidence of this system has been debated.

The transition to smart grids needs to be viewed in the context of the market liberalization in Europe, which started in the 1990s, and the objective to reduce climate change by decreasing CO2 emissions.[22] Market liberalization allowed for new entrants in the market and opened up the possibility of rearranging the system from how it was originally organized. Access for new entrants stimulated competition in the energy market, which in turn would benefit from energy suppliers' more efficient operations. The efficiency gains would be passed on to consumers in the form of lower energy prices.[23] This corroded the paradigm that electricity supply and distribution should by definition be centrally organized by the government.

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[18] The IEEE definition for interoperability is the following: "Ability of a system or a product to work with other systems or products without special effort on the part of the customer. Interoperability is made possible by the implementation of standards." Retrieved 19 December 2014: http://www.ieee.org/education_careers/education/standards/standards_glossary.html

[19] CEN CENELEC and ETSI (2014) Smart Grid Set of Standards v 3.1, retrieved 19 December 2014: ftp://ftp.cencenelec.eu/EN/EuropeanStandardization/HotTopics/SmartGrids/SGCG_Standards_Report.pdf

[20] Commission Communication: Towards a European Charter on the Rights of Energy Consumers, COM(2007)386, p .3.

[21] Merriam Webster definition of a public utility is: "the business of supplying a commodity (such as electricity, gas, or transportation) to the members of a community".

[22] E.g. Clastres, C., (2011) Smart grids: another step towards competition, energy security and climate change objectives, *Energy policy,* 39(9).

[23] Jamasb, T., & Pollitt, M. (2005) Electricity market reform in the European Union: review of progress toward liberalization & integration, *The Energy Journal*, 26, p. 12

Aside from new commercial entrants, consumers had the opportunity to play a role in the system by not only generating energy for their own consumption but also by injecting their surplus into the grid. Whereas the centralized system only had a limited number of generation points, the new situation is decentralized in the sense that there is also generation at the grid's former endpoints: consumers. In addition, climate change objectives instigated a transition to a more sustainable use of energy supply, through more energy efficiency and the integration of renewable energy in the system.
The production and use of renewable energy places new demands on the system. These sources are generally only intermittently present (sun and wind), which makes it more difficult to match supply with demand and to maintain a stable voltage and frequency in the grid.[24] Ideally, the produced energy is immediately used, which requires that the demand respond to the availability of produced energy. In a centrally organized system that is based on fossil fuels, the demand can be predicted and met by firing up the energy plants. A decentralized system that is based on intermittent sources needs to adjust the demand to the supply.

Consumer participation and empowerment are important aspects in smart grid development.[25] A focus on consumers and their participation is crucial to make the shift to renewable energy succeed.[26] Consumers possess large amounts of space on their roofs for solar panels, which are potential renewable energy sources. Electricity consumers need to take part in the transition to smart grids to utilize that capacity. Eventually, they will need to use the smart grid to save and store energy and to produce and trade electricity from sustainable sources.
New developments like Demand Response Programs that enable the demand for electricity to adjust to its availability also require extra attention for consumer interests.[27] Demand response is the voluntary change in energy consumption by end-consumers in response to market signals, such as time-variable prices.[28] Thus, the electricity demand

[24] Kanchev, et al. (2011). Energy management and operational planning of a microgrid with a PV-based active generator for smart grid applications. Industrial Electronics, *IEEE Transactions on Industrial electronics*, 58(10).
[25] E.g. Momoh, J. A. (2009 15-18 March), *Smart grid design for efficient and flexible power networks operation and control*, presented at IEEE Power Systems Conference and Exposition. p. 2. Or Clastres, C. (2011) Smart grids: Another step towards competition, energy security and climate change objectives. *Energy Policy*, *39*(9), p. 5400.
[26] Huygen, A. (2011) De consument en de (on)vrije elektriciteitsmarkt, in: S. Pront- van Bommel (eds.) *De consument en de andere kant van de elektriciteitsmarkt*, Amsterdam UvA Centrum voor Energievraagstukken, p. 102-107 or Sencar, M, et al. (2014) Development of EU (European Union) energy market agenda and security of supply, *Energy,* 77 p. 118.
[27] Position Paper on Smart Grids, An ERGEG Public Consultation Paper, December 2009, ref: E09-EQS-30-04, p. 28 retrieved 5 December 2014: http://www.energy-regulators.eu/portal/page/portal/EER_HOME/EER_CONSULT/CLOSED%20PUBLIC%20CONSULTATIONS/ELECTRICITY/Smart%20Grids/CD/E09-EQS-30-04_SmartGrids_10%20Dec%202009_0.pdf
[28] Commission staff working document: Incorporing demand side flexibility, in particular demand response, in electricity markets, SWD(2013)442.

will increase when the supply is high, for example, because of favorable weather conditions for solar production, due to price stimulations. When there is a decline in production, higher prices should help demand to decrease. Demand response is also beneficial for peak shaving, in other words to help spread usage over a longer time period when the demand for energy is high. In this way the network is relieved during times of high demand, for example around six PM when most people get home from work.
Closely related to demand response is demand side management. Demand side management can include demand response activities, but its main focus is on energy conservation and efficiency.[29]
To ensure security of supply in the transition to a decentralized system that depends on integrated intermittent sources and more efficient energy use, grid monitoring is essential. This monitoring is exactly the role that smart grids play in the European energy market because the application of ICT helps monitor real-time demand, consumption and production and can link these three together.

1.1.3 What are standards?

What are standards exactly? A standard is a broad term that can denote different things. We explain their position in the EU and define an important distinction in the types of standards. Chapter 3 elaborates on standards.
EU Regulation no. 1025/2012 on European Standardization defines a standard as: "A technical specification approved by a recognized body for repeated or continuous use, with which compliance is not compulsory."[30] The standards that this research addresses are indeed "technical specifications". Nonetheless, the term has a broader meaning in this research, as it also includes standards that are developed in other standardization bodies than those that the EU recognizes, or not even developed within a standardization body. We will specifically indicate when it concerns the official European standardization organizations. Note that standards can also address non-technical details (e.g., protocols for such services as accountancy or security audits). Moreover, in this book, we will challenge the assumption that "compliance is not compulsory."
Generally, standards can be divided into two types: coordinative standards and regulatory standards.[31]

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[29] E.g. Mohsenian-Rad, A. H., et al (2010) Autonomous demand-side management based on game-theoretic energy consumption scheduling for the future smart grid, *IEEE Transactions on Smart Grid*, *1*(3) or Palensky, P., & Dietrich, D. (2011) Demand side management: Demand response, intelligent energy systems, and smart loads, *IEEE Transactions on Industrial Informatics, 7*(3).
[30] Art. 2 §1 Regulation No 1025/2012 on European standardization OJ 2012 L 316.
[31] This is the categorization Werle & Iversen use: Werle & E. Iversen (2006) Promoting Legitimacy in Technical Standardization, *Science, Technology &Innovation Studies,* 2(1), other authors use different terms such as

Coordinative standards are set to promote the interoperability of technologies. The electrical socket is an example, as it ensures that everything that needs to obtain electricity from the grid fits into the socket and is thus compatible. Similarly, DVD and GPS are coordinative standards, along with the metric system, USB, PDF, UTP, Wi-Fi and UMTS, as they all provide a single specification for different technologies from different companies to use. Coordinative standards can be developed within European Standardization Organizations (ESOs)[32], sometimes initiated by a European Commission mandate and sometimes by other parties. Independent organizations also develop standards, which are referred to as "industry standards". They are developed within constructions known as "fora and consortia", on the sole initiative of market parties. Standards can also be developed when a vendor's technical requirements are adopted as de facto standards without a prior coordinated standardization process (e.g., when a company introduces a new technology, and part of that technology becomes *the* standard). The QWERTY keyboard is an example of such a standard. It was developed by one typewriter company and thereafter adopted as a standard sequence for letters on a keyboard, as opposed to the less common AZERTY sequence for alphanumeric keyboards.

The aim of the smart grid standardization mandate is objective interoperability through consistent standards. The standards developed under the mandate are thus coordinative standards.

Regulatory standards are a policy means, which on a EU level are used in the *New Approach to Standardisation*.[33] The New Approach was introduced in 1985 in support of the Single Market.[34] The goal was to set up a European standardization system to remove technical barriers to trade. Certain public policy aims, such as product safety, could thus be achieved through technical requirements and codified in standards. These "essential requirements" for products are described in New Approach directives. The New Legislative Framework for standards adjusts the New Approach. On that basis, the Commission sets implementing measures for specific standards.[35]

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quality and compatibility standards: Swann, P., et al. (1996) Standards and trade performance: the UK experience, *The Economic Journal*, 106(438).

[32] The officially assigned ESOs are CEN, CENELEC and ETSI.

[33] Council Resolution 85/C 136/01 on a new approach to technical harmonization and standards, hereafter New Approach, OJ 1985 C 136.

[34] For further readings on the New Approach: Joerges, C., et al. (1999) *The law's problems with the involvement of non-governmental actors in Europe's legislative processes : the case of standardisation under the 'new approach'*, EUI Working Paper LAW No. 99/9, San Domenico: European University Institute, or Winn, J. & Jondet, N. (2008) A "New Approach" to Standards and Consumer Protection, *Journal of Consumer Policy*, 31(4) or Falke, J., & Joerges, C., ((2010) New Approach to Technical Harmonization and Standards, Its Preparation through ECJ Case Law on Articles 30, 36 EEC and the Low-Voltage Directive, and the Clarification of Its Operating Environment by the Single European Act, *The Hanse Law Rev*iew, 6, or Guide on the implementation of EU product rules, European Commission 2014, retrieved 25 March 2014: http://ec.europa.eu/enterprise/policies/single-market-goods/files/blue-guide/guidepublic_en.pdf.

[35]Decision 768/2008/EC on a common framework for the marketing of products, OJ 2008 L 218.

An ESO then creates standards based on that implementing measure. Once the standard is completed, it is published in the Official Journal of the EU and becomes a European Standard (abbreviated as EN – "European Norm"). National Standardization Bodies (NSB) are not permitted to develop any different national standards for the same subject, and they must also transfer the EN to an official national standard. Other standards can then still be developed, but they will have to comply with the directive. If companies do not comply with the directive, their national authority will sanction them based on a regulation regarding the marketing of harmonized products.[36] Figuring out how to comply with the directive and then proving that a technology that does not comply with the standard does comply with the directive is highly burdensome. In practice, this burden means that hardly any other standards exist outside the EN, and the EN becomes de facto binding. When, in the following chapters, we discuss regulatory standards, we will specify them as New Approach standards.

When viewing these two types of standards, one could assume that coordinative standards only impact the technical side of standards and do not affect the public sphere, as do regulatory standards. However, because of the normative influence of technology, standards also set rules that impact public policy, such as health, safety, and environmental policy. In this research, we therefore argue that coordinative standards can also regulate, in the sense that they entail de facto binding decisions that concern public policy areas. The understanding that coordinative standards can regulate raises the question of whether, in the absence of a New Approach-type process, there is a need for procedural safeguards for coordinative standards. Industry sets coordinative standards without the detailed preset requirements of a New Approach directive. This carries the risk that only the interests of industry are represented in the process. The parties involved may already have developed relevant technologies prior to standardization and it is obvious that they want to include their technologies in the standard. Companies will therefore pursue an outcome in their favor.[37] Hence, it is unlikely that public policy will be sufficiently considered, which results in a standard at odds with policy aims and requirements.

1.1.4 Ramifications

We observed that the development of smart grids does not merely concern useful or convenient technology like for instance Google Maps. Smart grids have a profound impact on peoples' lives. Smart grids play a central role in EU energy policy and since

[36] Regulation no 765/2008 on a common framework for the marketing of products, art. 41, OJ 2008 L 218.
[37] Lim, A. S. (2006) *Power Battles in ICT Standard-Setting Process, lessons from mobile payments*, (Dissertation), Eindhoven University of Technology p. 192.

standards play an important role in the development of smart grids, standards are in turn concern a for EU policy.
EU policy regarding smart grids has several different focus points. Chapter 4 of this book describes and analyzes EU smart grid policy aims in detail. In short, these aims involve the proper functioning of the market, ensuring security of supply, and reducing climate change by reducing carbon emissions. This, among other things, is to be achieved through the penetration of renewables and by energy efficiency. Decisions made in standards can have consequences that support that policy, but they can also have consequences that infringe on the policy. Another issue concerns the protection of consumer interests. In the development of technology consumer interests such as privacy protection, are not always sufficiently taken into account. The possibilities and restrictions of smart grids standards can support or oppose the policy aims.
To safeguard these policy aims and requirements, a material framework that states policy requirements is imperative. This framework is the only way to ensure that the process considers those requirements. It is therefore important that the Commission's request for standardization provide clear enough requirements that relate to these policy objectives. In addition, there is a need for a procedural framework to support decision making towards those requirements. We will discuss the grounds for these safeguards and what they mean for the standardization process in this thesis.

1.2 Approaching this research

1.2.1 Research questions

The problem presented in the previous section leads to the following question to be answered in this dissertation:

RQ *How can policy aims and requirements be safeguarded in the technical standardization of smart grids?*

This question will be addressed through four subquestions:

SQ1 What is the current EU legal framework for standardization?
SQ2 What are the policy aims and requirements for smart grids?
SQ3 What is the legal status of standards?
SQ4 Are the policy aims and requirements sufficiently secured by the current legal and regulatory system of standardization?

"Safeguarding" is a focal term in the research question, which requires us to clarify its meaning. We use the following definition of "safeguarding", as formulated by Merriam-Webster: "something that provides protection against possible loss, damage, etc." The word "possible" is important here; it underlines that we do not assume that policy aims and requirements will, by definition, be impeded by standards, but we argue that this impediment is possible.

1.2.2 Structure of the book

In this subsection we will introduce how these questions are addressed, following the structure of the book.

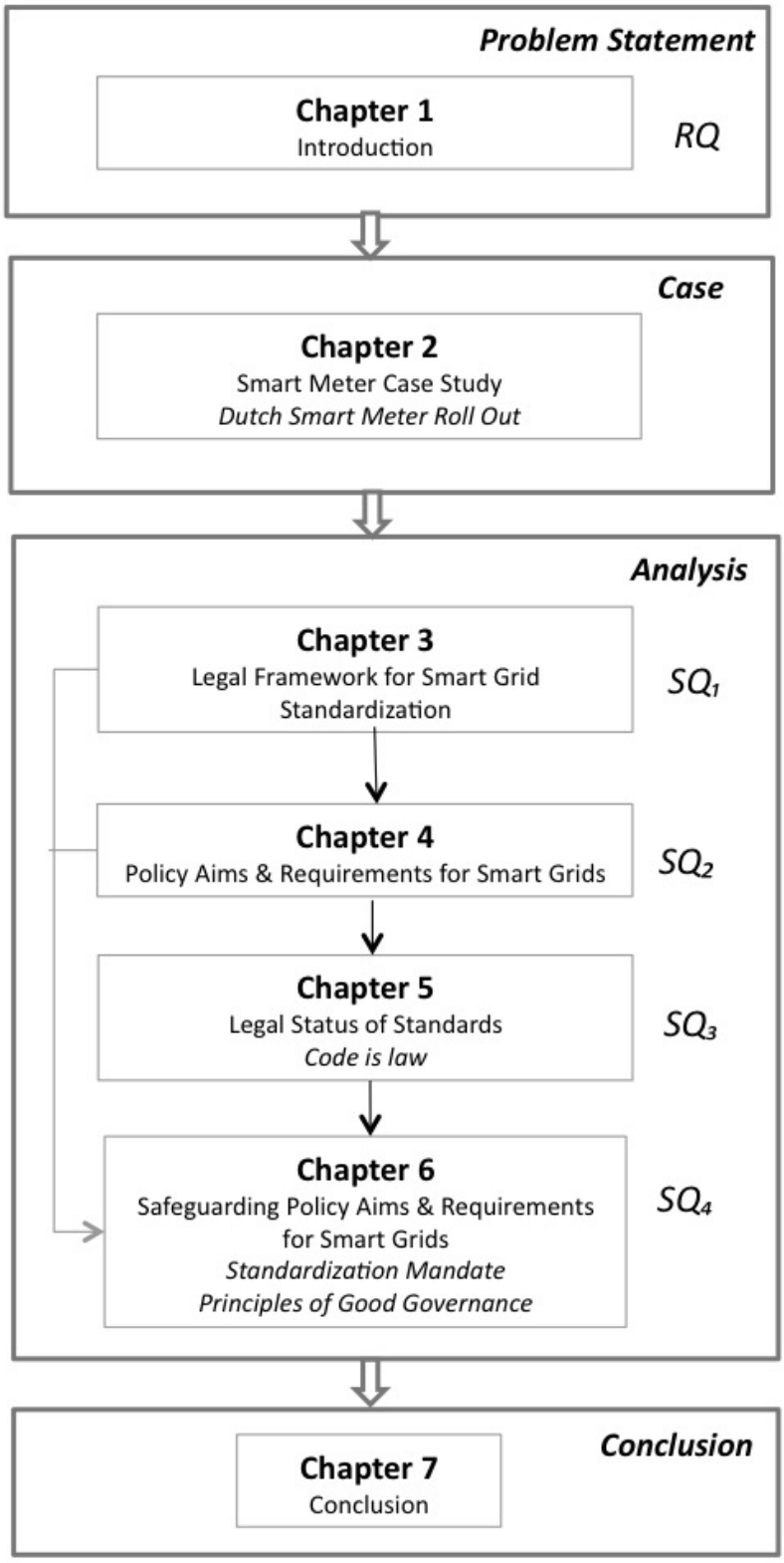

Figure 1.1: Structure of the research

Chapter 2, provides an illustration of the problem statement of the research. It presents a case study of the smart meter rollout and its standardization in the Netherlands. This case provides a relevant case as the smart meter is related to smart grids, and comprises a

completed standardization process as opposed to EU smart grid standardization, which process is still in progress.
The smart meter case functions as an exploratory case study[38] as method in the sense that we use it to investigate the specific issues that come about in a standardization process related to smart grids. The Dutch legislative history concerning the rollout of the smart meter is analyzed in order to understand the policy objectives of the rollout of the smart meter. Subsequently, we will elaborate on the first standard that was developed and that eventually failed for deployment. We will see that there is an actual threat to policy aims (energy efficiency and stimulating renewable energy) and requirements (privacy protection) while at the same time the process and its outcome remain without legal safeguards.

Chapter 3 answers the question of what the legal framework for EU standardization is SQ1. In order to discuss the safeguards for policy aims, it is necessary to first establish the current situation. This chapter is approached by a combination of literature study, law and policy analysis and case law analysis. In this chapter we will elaborate what standardization is, and go into detail about the legal framework of standardization. We will review what the New Regulation on Standardisation means for the current standardization process.[39] We will particularly discuss the content and status of the standardization mandate, which has always been assumed to function as a contract, yet we will see that the New Regulation on European Standardisation alters this point of view. Furthermore, we will discuss the legal context of standardization of smart grids specifically.

Chapter 4 subsequently addresses the second subquestion SQ2: what are the policy aims and requirements for smart grids? In order to determine the relevant safeguards for smart grid standardization, it is of course important to establish what these aims and requirements are. In this chapter we analyze EU smart grid policy and the requirements in the legal context. It is an analysis of policy and law. The aims in this chapter are to categorize the overall objectives for smart grids as to be found in the EU legal and policy framework. The requirements are the specific conditions that the legal framework generates for the development of smart grids. These first of all stem from the Treaty on the Functioning of the European Union and related directives. Secondly, because of the new role of the energy consumer in smart grids, there are specific requirements pertaining to the end user. The most important requirement in this respect is data protection. As to the policy aims for smart grids; these are primarily related to carbon

[38] Yin, R (2009) *Case study research: Design and Methods*, Thousand Oaks: Sage Publications, p. 9.
[39] Regulation No 1025/2012 on European standardization, OJ 2012 L 316.

emission reduction, but also address issues as decentralized production and integrating electric vehicles.

In Chapter 5 we answer the third subquestion SQ3 of what the legal status of standards is. The status is important for understanding which safeguards are needed. We especially question to what extend standards are binding, and in what ways they resemble law, using the theoretical background of the theory of "code is law". This part is based on a literature study. This discussion shows that technology in itself can set norms that are not necessarily in line with the legal system in which they are applied. Therefore, it is argued that additional procedural guidelines are necessary to ensure that public policy aims are encompassed in technology. Subsequently, we will review how standardization relates to this theory and moreover how they relate to objections that are made to the theory of "code is law". Furthermore, we will review the legal status of standards when these are incorporated in national law. To this end, we will discuss a national case and a EU case that relate to the question of the legal status of standards. This part therefore encompasses case law analysis. The EU case shows for the first time that standardization organizations can be viewed as a public authority in certain situations, which is important in addressing the legal status of standards.

In Chapter 6 we will first answer the final subquestion SQ4 of whether the policy aims currently are sufficiently safeguarded. We will review to what extent the legal framework we discussed in Chapter 3 is suited to safeguard the policy aims and requirements of Chapter 4. After establishing that this framework does not provide sufficient safeguards for the policy aims and requirements in smart grid standardization, we will conclude what is needed to safeguard these aims, answering the main question of this research. We will argue that, especially due to the new status of the standardization mandate, the aims and requirement have to be codified in the mandate itself. Moreover, to ensure that the process subsequently takes the stated requirements into account sufficiently, a procedural framework is necessary. We will assert that the EU principles of good governance provide a relevant framework.

Chapter 7 finally summarizes the conclusion of the research.

1.2.3 Further explanation

There are a few guidelines for reading this book. First of all, as this is a legal research applied in a technical domain, we strived to make the text understandable for both legal and technical scholars. This means that in certain parts, explanations of technical nature might seem quite simple for those with a technical background. In other instances an

extensive description of legal doctrine is given, while they concern basic legal knowledge. In the latter cases we lowered the font size indicating that legal scholars can skip it without missing anything.

Furthermore, the references are made in footnotes. These references contain page numbers where they refer to a specific explanation or statement. When the reference pertains to the main message of the article or book, or a message that reappears throughout the piece, the page number is omitted, as including page numbers would in those cases entail an extensive list of all relevant pages.

Finally, regulation is a focal concept in this research and demands clarification. Regulation is often described in the context of governmental or social regulation[40]. In the latter sense it is "regulation as encompassing all mechanisms of social control, by whomsoever exercised".[41] It can also be described from the point of view of the subject that is regulated. In this sense regulation is that what constrains the subject.[42] We combine these approaches. It is the exercise, or mechanism if you like, of control of the subject. This control can stem from the government, but also from environment, self-regulatory standards and, as we will see, code. It can be regulation that is conscious and on purpose, but also includes unintended regulation.

1.2.4 Scope

One could argue that always staying on course and never straying from the topic of a doctoral thesis is similar to working within the perimeter of a postage stamp. There is much to be discussed, but these items all need to fit within the borders of a strictly preset research design. This research is no exception, and numerous issues, interesting as they may be, thus fall outside the scope of this research. This section describes the scope.

We will start with the geographical scope. Our focus lies in smart grid standard development at the EU level. Our goal is to look at the embedding of standards in the EU legal system. Of course, global standards (e.g., IEC or IETF standards) are important on the international level, and they greatly influence the content of European standards; however, EU member states must comply with the EU system of standardization, which is much stricter than international standards. First and foremost, it is important that the European Commission initiated smart grid standardization through a standardization mandate. Second, because smart grid standards become official European standards, Similarly, non-official fora and consortia also develop smart grid standards, such as the IEEE. The question of safeguarding policy aims and requirements is not addressed in these types of standards. This EU-level focus also means that we will not examine

[40] Baldwin, R., et al. (1998) *A reader on regulation*. Oxford: University Press, p. 3-4.
[41] Baldwin, R., et al. (2012). *Understanding regulation: theory, strategy, and practice*, Oxford: University Press, p. 3.
[42] Lessig, L. (2006). *Code, version 2.0,* New York: Basic Books, p.121-122.

questions of member state competences in the energy market. For instance, interesting discussions about the consequences of services of general economic interest will not be included. The only way that the national perspective is studied in this research is through an explorative case of general standard setting (Chapter 4) or the provision of additional insights into what the legal status of standards are, according to the judiciary (Chapter 7).
Additionally, the standards of interest in this research are the standards developed under the EU Commission's mandate for smart grid standardization.[43] Standards related to smart grids that are not developed under this mandate are thus excluded from the research question.
In addition, smart grids also relate to the creation of a European super grid. A super grid uses smart grid technology to enable long-distance transmission of energy from renewable sources. The surplus of solar power in southern Europe could thus potentially be transported to northern Europe, or the surplus of wind in the North could be transported to the South. This scenario is not addressed in this research.
Although the research has an EU focus, we will not go into the question of competence delegation to the ESOs. Especially in relation to regulatory standards, this question is interesting, as it addresses an action regarding regulations that private ESOs execute. This raises, for example, questions of whether the subject of standards falls within the competences of the EU. EU smart grid standards are not regulatory standards are and aim at creating interoperability, instead of achieving policy aims. In other words, their aim is not to achieve EU policy aims for smart grids, but purely to support their development by creating common standards. Therefore, we will not address the permissibility of delegation to the ESO and only address the coordinative standards from the smart grid standardization mandate.
Finally, the main approach in the research is a legal approach. Especially in the energy market, policy is industry-driven. This means that it is important to determine up front which legal values have to be upheld. While in standardization research questions of economics and political science predominate, it is particularly important to look at standards' place in the legal system and legal values. This means that this research will not go into what happens in the discussions and negotiations before and during standardization. These so-called "power battles" are part of the debate about which parties have the most control and power to influence the process.[44] In this research we will not go into the deliberation itself because of the lack of sufficient empirical evidence to explain the negotiation dynamics amongst participants. We will, however, take these negotiations as a given, and assume that the involved parties are primarily motivated by

[43] Standardization Mandate to European Standardisation Organisations (ESOs) to support European Smart Grid deployment, Brussels 1st March 2011 M/490.
[44] Lim, A.S. (2006) *Power Battles in ICT Standard-Setting Process, lessons from mobile payments,* (Dissertation), Eindhoven University of Technology p. 192.

their own profits regarding the standard. Why else would they invest all the time and effort to do so?

1.3 Scientific relevance and innovation

In the current European framework program for research and development, Horizon 2020, standardization is mentioned as one of the measures that will support market take up of innovation.[45] Despite the importance of standards for markets and society, there is little academic research on this topic.[46] The period after the introduction of the New Approach did enjoy a fair amount of scholarly consideration, which could be explained by the fact that prior to the New Approach, standardization was an activity that belonged in the public sphere because the EU Council was responsible for developing standards. Some scholars therefore perceived the New Approach to standardization as a delegation of power to standardization organizations. When the New Approach became a relatively "Old Approach", the topic faded away from the legal academic debate. The subject has, however, become more prominent over the years due to the growing influence of technology. As a result, standardization has also become more important. It is thus time to review this subject in light of the role that technology plays in society today.

There are several topics of legal academic debate that relate to the research question, but they are not quite the same. A well-discussed topic, for example, is the idea that written law is not sufficient to protect ethics and individual rights (e.g., due process and nondiscrimination in technology) and that these rights should be incorporated into the design phase.[47] Similarly the theoretical approach of value sensitive design argues to determine values up front, in order to sufficiently encompass them in technology.[48] More specific is the discourse on "privacy by design," in which legal and technical scholars suggest that privacy protection should be embedded in technology by including it in the design phase.[49] Slightly different is Lessig's approach of "code is law"[50], which not only describes technology as potential threat for rights but also assumes that technology is itself a regulator of behavior. Similarly, "techno-regulation" is observed as a way for

[45] Commission Communication: Horizon 2020, COM (2011)808, p. 9.
[46] E.g. Biddle, B., et al. (2012) The Expanding Role and Importance of Standards in the Information and Communications Technology Industry. *Jurimetrics*, 52, p. 178, or Timmermans, S., & Epstein, S. (2010). A world of standards but not a standard world: toward a sociology of standards and standardization, *Annual review of Sociology*, 36, p. 70.
[47] Hildebrandt, M. (2011) Legal Protection by Design. Objections and Refutations, *Legisprudence* 5(2) or Albrechtslund, A. (2007) Ethics and technology design. *Ethics and Information Technology*, *9*(1).
[48] Friedman, B., et al. (2008) Value sensitive design and information systems, in: Himma, k. & Tivani, H. (eds.) The Handbook of Information and Computer Ethics, New Jersey: John Wiley & Sons, p. 69-102.
[49] E.g. Langheinrich, M. (30 Sept.- 2 Oct. 2001) *Privacy by design—principles of privacy-aware ubiquitous systems*, presented at *Ubicomp: Ubiquitous Computing* or Cavoukian, A., et al. (2010) Privacy by Design: essential for organizational accountability and strong business practices.*Identity in the Information Society*, *3*(2).
[50] Lessig, L. (2006) *Code, version 2.0,* New York: Basic Books.

governments to regulate behavior through certain design requirements without actually using the law.[51] In this area of research, the regulating properties of technology are acknowledged and put into use. This type of research discusses the effectiveness of regulation through technology codes, instead of legislative codes, and addresses potential pitfalls. In this research, we will not review the situation in which governments consciously use code to regulate people, but we will investigate the way technology—sometimes inadvertently—regulates without governmental involvement.

There are also a few scholars who are concerned with more standards-specific topics. Where the former researchers addressed the relationships between law and technology in general, these scholars specifically address the standardization process. These studies pertain to the field of global governance, transnational governance and transnational private regulation. They mainly question the legitimacy of decision-making and the accountability of standards bodies.[52]

Moreover, there is an area of legal research, mainly conducted in the 1990's that addresses the legal status of standards, with which this research has a large overlap.[53] However, there are three crucial differences. The first difference is that this research includes the "code is law" perspective. The second difference is simply time. Recent years have brought additional academic insights and case law, which allow for a new understanding on the topic. The third difference is that this research focuses on one specific case: smart grids.

1.4 Publications

During this research we have published a number of articles. Below is given a list of refereed publications, together with the places in the thesis where parts where used.

- R. Hoenkamp, A.. de Moor-van Vugt & G. Huitema (2013) Law and standards - Safeguarding societal interests in smart grids, in: R. Leenes & E. Kosta (eds.), *Bridging distances in technology and regulation* (p. 103-122). Oisterwijk: Wolf Legal Publishers.

  (Chapter 2, and 6)

[51] E.g. Brownsword, R. (2005) Code, control, and choice: why East is East and West is West. *Legal Studies*, *25*(1) or Leenes, R. (2011) Framing techno-regulation: An exploration of state and non-state regulation by technology. *Legisprudence*, *5*(2).

[52] E.g. Koppel, J. (2010) *World Rule: Accountability, Legitimacy and the Design of World Governance*, The University of Chicago press or Schepel, H. (2005) *The constitution of private governance: product standards in the regulation of integrating markets,* Portland: Hart Publishing or Scott, C., et al. (2011) The conceptual and constitutional challenge of transnational private regulation. *Journal of Law and Society*, 38(1).

[53] E.g. Stuurman, C. (1995) *Technische Normen en het Recht*, (Dissertation) VU University Amsterdam or Elferink, M. (1998) *Verwijzingen in wetgeving: Over de publiekrechtelijke en auteursrechtelijke status van normalisatienormen*, (Dissertation) Leiden University.

- R. Hoenkamp & G. Huitema (10-12 May 2012) *Good standards for smart meters,* presented at European Energy Market (EEM), 9th International Conference on the European Energy Market, IEEE.

  (Chapter 2)

- R. Hoenkamp, E. Folmer & G. Huitema (18-20 June 2012). *Applying legal principles to stimulate open standards: The role of forums and consortia* in: The 17th EURAS Annual Standardization Conference, Aachen.

  (Chapter 6)

- R. Hoenkamp, G. Huitema & A. de Moor-van Vugt (2011) The neglected consumer: the case of the smart meter rollout in the Netherlands, *Renewable Energy Law and Policy Review,* 4.

  (Chapter 2)

2 Smart meter: a case study

This chapter describes the case of standardization of the smart meters in the Netherlands. It illustrates the theme of this research: the possibility that, given the current standardization system, standards interfere with policy objectives and requirements in the current standardization system.
We will see that in the Dutch smart meter case, the standard contradicted the policy aims and requirements in two ways: by failing to provide energy efficiency improvements and by infringing on the users' right to privacy. As this standardization process has similarities with the standardization process of smart meters and grids on the EU level, we can learn from this to prevent similar problems and to better safeguard smart grid standardization.

2.1 Why this case study

The objective of this chapter is to provide a concrete illustration of how standards can be detrimental to policy aims and requirements in the domain of smart grids. In this case, the policy aim to improve energy efficiency was insufficiently secured. The requirement that was not met in this case, was the protection of personal data. The smart meter case functions as an exploratory case study[54] in the sense that we study this issue and its consequences in practice to understand the process of a governmental request for standardization and its subsequent implications.
The smart meter case provides a useful case because the introduction of a smart meter is viewed as the first step towards smarter electricity grids.[55] The Dutch case presents an interesting situation for exploring the standardization process also because the Netherlands was one of the first Member States to develop a smart metering standard and in the process experienced a relatively large number of issues concerning the rollout of the smart meter. The Dutch smart meter standardization produced a finalized standard and thus the case provides an appropriate example to examine the possible implications of standardization.

In this chapter, we will see how the Dutch Minister of Economic Affairs requested the Dutch standardization body to develop a standard for smart meters without giving clear requirements that the standard should comply to. As we will see in Chapter 3, the European Commission made a similar request to the ESOs for standardization of smart grids. The Commission also provides very few, albeit, more requirements for standardization than the Dutch Minister.

[54] Yin, R.K. (2009) *Case study research: Design and Methods*, Thousand Oaks: Sage Publications, p. 9
[55] E.g. SMB Smart Grid Strategic Group: IEC Smart Grid Standardization Roadmap, 2010, p.77 retrieved on 20 October 2014: http://www.iec.ch/smartgrid/downloads/sg3_roadmap.pdf

We first analyze the Dutch legislative history concerning the rollout of the smart meter to understand its objective. Subsequently, we elaborate on the first standard the NTA 8131 that was developed that eventually failed in use. In this case, we see that there is an actual threat to public policy aims (energy efficiency) and policy requirements (privacy protection) when the process enjoys only limited legal safeguards.

2.2 Background

A smart meter is an electricity meter that, by means of ICT, communicates information about electricity usage to different channels such as in-house appliances or to external service providers. It can provide detailed information regarding varying facts such as electricity usage for peak consumption and averages. The main difference between a smart meter and a traditional meter is that instead of only showing the current total usage on the meter itself, it can also show the usage details of preset intervals and communicate these directly to other parties, such as distribution system operators (DSOs) or utilities.

Smart meters are currently being introduced in several Member States in line with the EU objectives replace 80% of the traditional meters with smart meters by 2020. In Europe, Italy and Sweden were the first to plan a full rollout of the smart meter.[56] In Sweden, the approach was to install the meters in three stages with the aim of providing monthly electricity billing for customers. Energy supplier Vattenfall entered into contracts with three different technology suppliers offering different levels of functionality. Thus, other technologies could be added later without disrupting the business case.[57] It meant, however, that several of the first meters did not support energy efficiency functions.[58] In Italy, the main purpose of the smart meter rollout was to reduce fraud.[59] Enel rolled out a standardized meter with limited functionalities. They immediately started the rollout of meters without any common standards. Therefore later, in 2006, Italy introduced a minimum set of functions with which new meters should comply.[60]

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[56] ERGEG: Smart Metering with a focus on Electricity Regulation, 31 October 2007, p. 43 retrieved on 9 October 2014:
http://www.ceer.eu/portal/page/portal/EER_HOME/EER_PUBLICATIONS/CEER_PAPERS/Customers/2007/E07-RMF-04-03_SmartMetering_2007-10-31_0.pdf.

[57] Haney, A. B., et al. (6-9 June 2011) *Smart metering and electricity demand: Technology, economics and international experience*, 21st International Conference on Electricity Distribution, Frankfurt.

[58] Stromback, J. & Dromacque, C. *Evaluation of residential smart meter policies,* retrieved July 2010:
http://www.worldenergy.org/documents/ee_case_study__smart_meters.pdf

[59] Kadurek, P., et al. (11-13 Oct. 2010) *Theft detection and smart metering practices and expectations in the Netherlands*, presented at IEEE Innovative Smart Grid Technologies Conference Europe (ISGT Europe).

[60] Vasconselos, J. (2008) *Survey of Regulatory and Technological developments Concerning Smart metering in the European Union Electricity Market,* RSCAS PP 2008/01, Florence: Florence School of Regulation, p. 48

2.3 EU legislation for the smart meter

2.3.1 Before the Third Electricity Directive

The rollout of smart meters is the result of EU legislation. It supports the 20%-20%-20% targets of the EU Climate and Energy Package regarding reduction of greenhouse gas emissions, increase of renewable energy, and more energy efficiency.[61] The meter plays an especially important role in the energy efficiency aim because it can help households reduce their energy use by becoming more aware of their usage. Moreover, the meter supports the increase of renewable energy by measuring injection into the grid.[62]

The EU Energy Efficiency Directive 2006/32/EC required Member States to provide citizens with smart meters. Article 13 §1 states that "Member States shall ensure that, in so far as it is technically possible, financially reasonable and proportionate in relation to the potential energy savings, final customers for electricity, natural gas, district heating and/or cooling and domestic hot water are provided with competitively priced individual meters that accurately reflect the final customer's actual energy consumption and that provide information on actual time of use." The Directive explicitly stressed that the goal of the Directive (which includes the smart meter rollout) is energy efficiency.[63]

In March 2009, the European Commission issued a standardization mandate to the European Committee for Standardization (CEN – Comité Européen de Normalisation), the European Committee for Electrotechnical Standardization (CENELEC - Comité Européen de Normalisation Électrotechnique), and European Telecommunications Standards Institute (ETSI) to develop an "open architecture" for smart meters.[64] CEN, CENELEC and ETSI are European standardization bodies. The objective of this mandate is to enable interoperability between meters, and, thereby, improve customer awareness to allow timely adaption of their demands.[65] Until the European smart meter standard development is advanced sufficiently, Member States need to determine the functionalities for the meter. Different countries have different approaches. In the UK

[61] The targets are set out in Commission Communication:: EUROPE 2020, A strategy for smart, sustainable and inclusive growth, COM(2010)311, p. 9.

[62] This is one of the 16 recommendations concerning the smart electricity meter of the Final Guidelines of Good Practice on Regulatory Aspects of Smart metering for Electricity and Gas, ERGEG: 8 February 2011, p. 12 retrieved on July 24 2014:
http://www.ceer.eu/portal/page/portal/EER_HOME/EER_CONSULT/CLOSED%20PUBLIC%20CONSULTATIONS/CUSTOMERS/Smart%20metering/CD/E10-RMF-29-05_GGP_SM_8-Feb-2011.pdf.

[63] Directive 2006/32/EC art. 1, OJ 2006 L 114.

[64] Standardisation mandate M/441 for the development of an open architecture for utility meters involving communication protocols enabling interoperability, Brussels 12 March 2009, p.2.

[65] Ibid.. p.1.

for example, the Department of Energy and Climate Change together with the Office of Gas and Electricity Market developed a list of 119 technical requirements.[66]

2.3.2 Since the Third Electricity Directive

In the preparatory stage of the Third Electricity Directive 2009/72/EC, the smart meter was an important topic.[67] The EU's Assembly of Regional and Local Representatives (Committee of Regions) was reluctant because of the price increase of the meter and the suitability of the meter.[68] The European Economic and Social Committee stressed the importance of the functionality of the bidirectional energy flow (thus including injection measurement) of the meter.[69] The Committee on Industry, Research and Energy proposed several amendments concerning data handling and access for consumers. However, these issues were not addressed.[70] In a later review of the proposals, the European Parliament presented the proposition for an economic assessment, preceding the meter rollout. With a positive outcome the aim would be an 80% rollout by 2020.[71] The Parliament also stressed the importance of standard that encourages decentralized production and energy efficiency.[72]

The final version of the Directive prescribed individual Member States to replace their traditional meters with smart meters by 2020 in case of positive outcomes of the assessment. These implementations could be preceded by an economic assessment that had to be finalized in September 2012 according to Annex 1 of the Directive. This meant that Member States should have completed trials before that time, which not all of them managed. In case of a positive outcome of the trial, the rollout would take place. At the end of 2014, all Member States have either conducted a cost-benefit analysis based on a trial, or they are still in the process. It should be noted that contrary to most standardized products, as a general rule the users of smart meters will not own the meter in most EU countries.[73] The DSO will maintain ownership of the meter after it is installed, and users will have no choice in the type of meters.[74]

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[66] Ofgem (2011) *Smart Metering Implementation Programme, Functional Requirements Catalogue,* London, retrieved on 12 December 2014:
https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/42737/1480-design-requirement-annex.pdf

[67] Directive 2009/72/EC concerning common rules for the internal market in electricity OJ 2009 L 211

[68] CoR 22/92, Opinion of the Committee of Regions no.22 of 2008

[69] EESC(08)314-318, Opinion of the European Economic and Social Committee no. 314-318 of 2008.

[70] A6-0191/2008.

[71] A6-0216/2009.

[72] A7-0120/2010.

[73] Vasconselos, J. (2008) *Survey of Regulatory and Technological developments Concerning Smart metering in the European Union Electricity Market,* RSCAS PP 2008/01, European University Institute, Florence, p. 22

[74] Only consumers with a large connection will be able to buy their meter independently Concept Voorstel van wet houdende regels met betrekking tot de productie, het transport, de handel en de levering van elektriciteit en gas (Elektriciteits- en gaswet) MEMORIE VAN TOELICHTING, §5.8.

Energy Efficiency Directive 2012/27/EU repeals the aforementioned Directive 2006/32/EC.[75] Articles 9-11 of the new Energy Efficiency Directive address the rollout of the smart meter. This Directive instructs Member Stated that had a positive outcome of their cost-benefit analysis to start the rollout of smart meters. It also provides several technical requirements with which the smart meter should comply. We will elaborate on these requirements in later sections.

2.4 The Dutch smart meter rollout

In March 2014, the Dutch government announced that the cost-benefit analysis of the pilot rollout of the smart meter was positive and, therefore, the large-scale rollout would start on January 1 2015. An Order in Council provides the framework for the new meter through minimum requirements.[76] The latest standard, which is a revision of the Dutch Smart Meter Requirements (DSMR) version 5 complies with this Order, yet meters complying with this standard will only be offered in 2016. Following the pilot, the standard was reviewed. In this section, we will give an overview of what has happened since the topic of the smart meter was introduced in the Dutch parliament. This section focuses on policy aims, the technical functions of the meter, and obstacles that preceded the rollout.

2.4.1 Chronology of the Dutch case

In essence, the meter rollout had three phases. In the first phase, the government introduced the rollout of the smart meter in a legislative proposal, which eventually led to the development of the NTA (Dutch Technical Agreement) 8130. In the second phase, the rollout was laid down in a Bill, which was met with severe criticism from several political parties in parliament. In the third and final phase, the Bill was modified, and the pilot and large-scale rollout was implemented in the Electricity Act.

2.4.1.1 The first preparations for introducing the smart meter and the standard

The first time Dutch legislative history mentions the smart meter is in 2004, and is addressed from the perspective of improving the demand response at the level of consumers.[77] This is prior to the European obligation of the rollout based on the Electricity Directive 2006/32/EC. The next time the smart meter is brought up in the legislative history is more than a year later. At this point the request for standardization

[75] Energy Efficiency Directive 2012/27, OJ 2012 L 315.
[76] Besluit van 27 oktober 2011, houdende regels over op afstand uitleesbare meetinrichtingen.
[77] *Kamerstukken II* 2003/04 29023 nr. 4 §5.2

to the Dutch NSB (the NEN, Nederlands Normalisatie-Instituut) for standardization is announced. At this stage, standardization is viewed as a crucial step to support innovation and to ensure interoperability between technologies for consumers and systems.[78]
In the same year KEMA, a Dutch energy consulting- and certification organization, issues a report with a cost-benefit analysis of the smart meter. In this report the basic functionalities are presented: determining and saving real-time usage, remote and local reading of usage, and the functionality to remote limitation or shut down of energy usage.[79]

In the meantime the Dutch NSB, performed a "strategic exploration" on smart meters commissioned by SenterNovem (part of the Ministry of Economic Affairs). In this exploration, the NEN brought 70 representatives of stakeholders together to discuss what developments would stimulate demand response[80], who the most important stakeholders and their roles were, and whether enough parties were willing to contribute to the standard development of the smart meter.[81] The report concluded that a standard would contribute to removing insecurities in the market at that time. The report stated that all relevant different types of stakeholders took part in the discussion, including consumer organizations.[82] The list of participants showed that different players in the market were represented such as Landis + Gyr (energy management), ABB (automation and power), DTe (at that point the Dutch energy regulator), General Electric (appliances/power systems), Nuon (supplier), and Tennet (transmission system operator). However, the list did not mention any consumer organizations or other societal stakeholders as announced in the report.[83] As we will see in Chapter 3, the inclusion of societal stakeholders is important to support the inclusion of non-commercial interests in the standardization process. Moreover, participation at an early stage as this strategic exploration is crucial to influence the outcome.[84] By explicitly mentioning consumer organizations as part of the exploration, it seems that its theoretical importance is recognized. Nonetheless, actual participation was not realized.

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[78] *Kamerstukken II* 2004/05 28982 nr. 44 p. 7
[79] KEMA (2005) *Domme meters worden slim? Kosten-batenanalyse slimme meetinfrastructuur*, 40510016-TDC 05-49216B, Arnhem, p. 55
[80] We discussed demand response in § 1.1.3 of this book.
[81] Costenoble, O., et al. (2005) *Strategische Verkenning 'Meetinfrastructuur en slimme meters' voor energieverbruik*, NEN, Delft, p. 5.
[82] Ibid. p.7.
[83] Ibid. annex A.
[84] Büthe, T. & Mattli, W. (2011) The new global rulers: The privatization of regulation in the world economy, Princeton: University Press, p. 43.

Subsequently, the Ministry of Economic Affairs instructed the same institute, the NEN, to set a NTA standard and draw up and describe a standardized minimum set of basic functions for a remotely readable meter.[85] This official assignment did not include any reference to requirements or policy aims that the standard should meet. The standardization committee was mainly composed of metering companies, suppliers and network operators. The Dutch Applied Research Institute (Nederlandse Organisatie voor toegepast-natuurwetenschappelijk onderzoek, TNO) was part of the committee at first but decided to terminate participation because of the lack of ICT knowledge in the committee, which it feared would lead to a deficient standard.[86] This standard, the NTA 8130, was finalized in 2007.

In the preparatory phase of the rollout, the parliamentary standing committee of Economic Affairs noted that from the point of view of the consumer, the meter should meet the minimum requirements for communication and information, such as a display of average usage.[87] The Minister of Economic Affairs, Wijn, responded that the meter would be beneficial to consumers because it would offer more frequent and precise information on their energy use. Thus, distributors would be able to offer better advice on saving opportunities and information for estimated yearly usage.[88] However, the Minister emphasized the smart meter as a measure to alleviate administrative burdens for the energy sector.[89] If the meter would send the information on usage to the network operator, this would reduce mistakes in manual administration. For instance, when a house changed residents, the electricity use could be traced back to the usage at the time new residents would inhabit it. Thus, the chances that the user would be billed for electricity he did not use would be reduced.

2.4.1.2 The Bill concerning the rollout of the meter

Up until this point, the discussion around the smart meter was not based on any legislation.[90] However, in March 2008, a proposal for changes in the Electricity Act 1998 encompassed the compulsory rollout of the smart meter.[91] The Bill stated that the functions of the meter would be determined by an Order in Council. The rollout was compulsory in a strict sense because consumers refusing the smart meter could be

[85] NTA 8130:2007, p. 2.
[86] Interview with a participant of the NTA 8130 committee for TNO on January 13 2011, for whom the main objection to the standard was the fact that the standard was not future-proof and did not provide a level playing field.
[87] *Kamerstukken II* 2006/07 28982 nr. 54 p.2.
[88] *Kamerstukken II* 2006/07 28982 nr. 57 p.1.
[89] *Kamerstukken II* 2006/07 28982 nr. 61.
[90] The rollout is also part of Bills 31373, 31320 and later becomes 32373 and 32374.
[91] *Kamerstukken II*, 31374, proposal for 'Alteration of the Electricity Act 1998 and the Gas Act to improve the operation of the electricity and gas market'.

prosecuted. The Bill required users to cooperate with the placement of the smart meter in several provisions. By referring to these provisions in the Act on Economic Crimes (Wet op de economische delicten), infringements of these provisions would constitute an offence for which one could be punished with a prison sentence at a maximum of six months or a fine of € 16.750.

Different purposes for the meter were mentioned throughout the legislative process. One emphasized the need to provide energy suppliers with the possibility to offer added value services, and for the network operators to optimize the functioning of the grid,[92] while in other instances the importance of improving demand-response was stressed[93]. Later on, the majority of parliament pleaded for an inclusion of functions in the standard meter for consumers to help them save energy, which in the end, at a EU level is the aim of the smart meter energy efficiency. The Minister of Economic Affairs disregarded their pleas by stating that such functions should be left to the market, and should not be part of the standard meter.[94] Similarly, the possibility for users to keep track of their produced energy was brought up in the discussion. For instance, supporting decentralized production can be provided by a function in the meter for gross energy production measurements.[95]

Privacy concerns

Around the same time, privacy and security issues of the meter popped up in public discussion and parliament raised these concerns in its discussions concerning the Bill.[96] Security and privacy protection were perceived to be important because the added software to the electricity meter made the meter vulnerable for hacking and cybercrime. Moreover, the Dutch Data Protection Authority (College Bescherming Persoonsgegevens, CBP) advised against the submission of the Bill in its report concerning the conformity of the Bill with the Dutch Data Protection Act (Wet Bescherming Persoonsgegevens, WBP). In addition, the Consumers' Association published a report by legal scholars in which it claimed that a mandatory rollout of the meter would constitute an infringement on the right to privacy as protected in the WBP and the European Convention on Human Rights, Article 8.[97] This violation was caused by the function of the automatic remote reading of energy use by the distributor every fifteen minutes, standardized in the NTA. In the same month, TNO published a report

[92] *Kamerstukken II* 2005/06 28982, nr. 51, p. 4.
[93] *Kamerstukken II* 2004/05 28982, nr. 4,4 p. 7.
[94] *Kamerstukken I* 31320/31374 2008/09 nr. 26.
[95] *Kamerstukken II* 2007/2008, 31374, nr.6.
[96] *Aanhangsel Handelingen II* 2007/08 nr. 373, p. 1.
[97] Cuijpers, C. & Koops, B. (2008) *Het wetsvoorstel 'slimme meters': een privacytoets op basis van art. 8 EVRM,* TILT- Centrum voor Recht, Technologie en Samenleving, Tilburg.

in which it criticized the NEN smart meter standard NTA 8130.[98] One of their points of criticism entailed that the display was not changed in comparison to the old meter and, thus, would not influence consumers' energy awareness. Hence, the meter did not provide an improvement to energy efficiency. In the end, it was decided that the NTA 8130 would not be acceptable as the national standard. The preparations for the rollout, however, did not allow for considerable delay, and the network operators decided to assemble and discuss their own standards, resulting in a new standard, the DSMR.

Another issue that was less prominently addressed in the debate, was health concerns related to the use of the meter.[99] Around the same time the privacy issues occurred, some people were worried that the additional radiation caused by the new meters could be harmful. Years later in November 2012, a test was conducted after an assignment of the Ministry of Economic Affairs, which concluded that the electromagnetic radiation from the meter stayed far below internationally allowed levels.[100]

2.4.1.3 The adoption of the Bill

Finally in April 2009, the Senate requested a revision of the Bill, which boiled down to the right of the consumer to refuse the installation of the smart meter.[101] Therefore, as opposed to the first proposal, consumers could now refuse the meter or have it switched off so that it functioned as a regular meter. Shortly after the House of Representatives accepted this proposed revision, Vrijbit, an organization that fights for privacy rights, presented another objection as they were not satisfied with the level of privacy protection. However, because the revision did not make the acceptance of the meter mandatory, the issue of privacy infringements was tackled. The Bill concerning the smart meters was adopted in February 2011 in the revised Electricity Act, followed by an Order in Council including the technical requirements, which entered into force in January 2012.[102] This Order determines the functions of the smart meter on which further standardization should be based. The DSMR was made consistent with this Order. In the meantime the industry representative of the DSOs, Netbeheer Nederland, chose three preferred suppliers for smart electricity meters be installed in Dutch households: Landis+gyr, IBM and Itron.[103]

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[98] Boekema, J. & Huitema, G. (2008) *Belemmering innovatie energiemarkt door implementatie voorgestelde Slimme Meter',* TNO Informatie- en communicatietechnologie, Groningen.
[99] *Kamerstukken I* 31320/31374 2008/09 nr. 26.
[100] Kamerbrief stand van zaken uitrol slimme meters, retrieved 24 July '14: http://www.rijksoverheid.nl/documenten-en-publicaties/kamerstukken/2013/02/18/kamerbrief-stand-van-zaken-uitrol-slimme-meters.html.
[101] *Kamerstukken I* 2008/2009 31320, 31374 nr. 28
[102] Besluit van 27 oktober 2011, houdende regels over op afstand uitleesbare meetinrichtingen, hereafter Order, retrieved on 20 October 2014: http://wetten.overheid.nl/BWBR0030605/geldigheidsdatum_20-10-2014
[103] As stated on the Netbeheer Nederlands' website on 25 July: http://www.netbeheernederland.nl/nieuws/nieuwsbericht/?newsitemid=197984364

2.4.2 A closer look at the functions of the meter

In the Dutch debate on the smart meter rollout, the functions of the meter have played an important role, both directly and indirectly.

2.4.2.1 The NTA standard

The standardization process in the Netherlands started with the NEN Workshop in the first phase where the functions for a smart meter were decided upon and were worked out in more detail in the final standard. The NTA 8130 standardization committee finally decided on the following functions for the smart meter:

- Contribute to the improvement of the administrative processes by generating real and remotely readable meter readings periodically and on demand (every 15 minutes).*
- Provide suppliers with the possibility to create awareness of the energy usage and stimulate energy savings.
- Activate or deactivate connections for gas and electricity remotely in a safe way.*
- Remotely adjust transmission values collectively or individually.
- Provide the possibility for the supplier to work with differentiated tariffs.
- Provide a possibility for a prepaid system.
- Can be used to monitor the distribution network. *[104]

The functions with a * were already determined in the previously mentioned strategic exploration discussed in §2.2.

In short the standard provides four communication ports for the meter. The first port (P1) is the consumer port. On this port consumer interfaces can be added, such as a display. It can only communicate information directly from the meter. It cannot transmit information to the meter, display interval values or communicate externally. The second port (P2) can communicate with other meters and network operators. This port communicates from and to the meter and shares interval values. The third port (P3) appliances communicates with the central access server (CAS). There can be multiple types of information communicated through this port such as interval values and transmission values. P3 then communicates this information every fifteen minutes through the fourth port (P4) to network operators, suppliers or third parties.

[104] NTA 8130:2007, p. 2

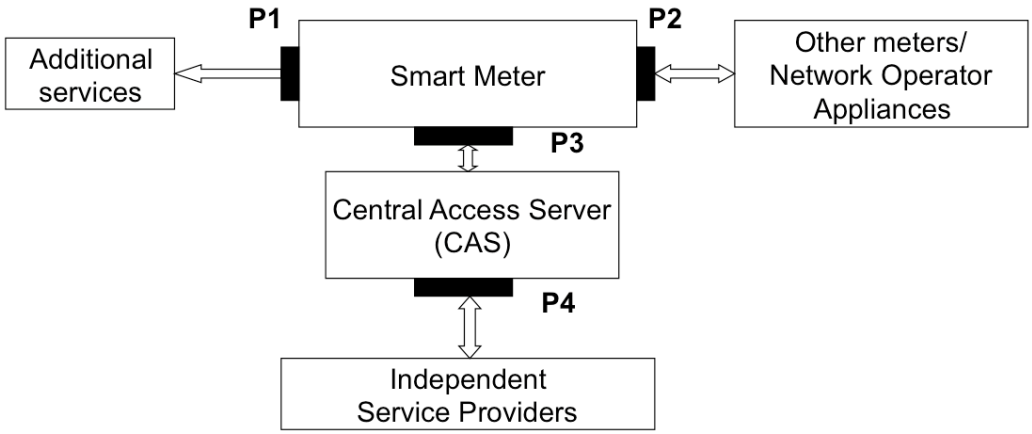

Figure 2.1: Communication ports of the smart meter (Dutch Standard NTA 8130).

The functions determined in this standard are highly beneficial for improving the administrative process and for monitoring the network. Furthermore, the standard is advantageous for suppliers because it creates the possibility to provide energy efficiency services and enables remote disconnection, for instance, in case consumers do not pay their bills.

The EU policy aims and requirements of the smart meter rollout, however, are not materialized in these functionalities of the standard. The policy aim for the meter was to encourage end-user energy efficiency. This function is not made possible by the standard. End-user efficiency can only be achieved if the consumers obtain better information on their usage. In other words, where P1 only provides additional services to be added, to achieve energy efficiency it should have provided a display that improved the energy consumption awareness of consumers.

A policy requirement is that the meter does not infringe on data protection law. This became clear in research reports concerning privacy protection by the Dutch Data Protection Authority and Consumers' Association. The function in P4 that sends the network operator usage information every fifteen minutes is an infringement on the right to privacy as this frequency is not necessary for its purpose of maintaining the functioning of the grid.

2.4.2.2 The requirements of the Order in Council

Finally, the Order in Council concerning the functions of the meter partly makes up for the disorganized start seven years later by elaborating on the requirements for the standard which became the DSMR. It comprises a list containing, amongst others, the following functions: Registering information in intervals of fifteen minutes and the ability to communicate that information daily to the network operator. It can also register a breach of the security of the meter. This Order also provides the opportunity

to shut off or restrict the supply of electricity. In a modification of the Order an obligation was added to communicate to the consumer if this functionality is switched on is added.[105]

2.5 EU smart metering standardization and functions

The EU case of smart metering standardization was different in several respects from the Dutch case. It started later and circumvented several failures of the Dutch standard. The assignment of standardization to the ESOs was more elaborate and included the aim of consumer awareness of consumption and several technical requirements for the meter. Naturally, the Dutch standard eventually needs to comply with the European standard.
The standardization request was mandated in March 2009 to the ESOs, considerably later than the Dutch assignment for standardization.[106] The mandate refers to art. 13 sub 10 of Directive 2006/32/EC, which determines the necessary features for metering and informative billing of energy consumption. It requires final customers to be provided with competitively priced individual meters that accurately reflect the final customer's actual energy consumption and that provide information on the actual time of use. Further, it demands compliance with the New Approach Measuring Instruments Directive 2004/22/EC [107] and Directives 95/46/EC [108] and 2002/58/EC [109] concerning personal data protection. At this point, it was clear, that privacy protection was an issue in the smart meter rollout. The ESOs set up the Smart Meter Coordination Group (SM-CG) to prepare the standardization of the smart meter. According to the SM-CG, the standards should be based on the following functions:

- Remote reading of metrological register(s) and provision to designated market organizations.
- Two-way communication between the metering system and designated market organization(s)
- To support advanced tariffing and payment systems
- To allow remote disablement and enablement of supply and flow/power limitation

[105] Besluit van 16 oktober 2014, houdende wijziging van het Besluit op afstand uitleesbare meetinrichtingen ten behoeve van de grootschalige uitrol van de slimme meter, also *Bijlage bij Kamerstukken I* 2013/2014, 29023, nr. 1.
[106] Standardisation mandate M/441 for the development of an open architecture for utility meters involving communication protocols enabling interoperability, Brussels 12 March 2009.
[107] Directive 2004/22/EC on measuring instruments, OJ 2004 L 135. This NA directive was later amended by Directive 2014/32/EU, OJ 2014 L 96, in line with the New Legislative Framework.
[108] Directive 95/46/EC on the protection of individuals with regards to the processing of personal data and on the free movement of such data, OJ 1995 L 281.
[109]Directive 2002/58/EC concerning the processing of personal data and the protection of privacy in the electronic communications sector, OJ 2002 L 201.

- Communicating with (and where appropriate directly controlling) individual devices within the home/building
- To provide information via web portal/gateway to an in-home/building display or auxiliary equipment[110]

The SM-CG has identified several relevant standards and is preparing more standards.
In the table below the correlation between services necessary for active consumer participation and the functionalities described in the SM-CG is presented. The table reveals that the possibility to measure consumption and production is not encompassed by the mandate. However, this possibility is crucial for households to produce their energy as a method to measure the amount of energy they produce. Although active consumer participation is repeatedly considered to be crucial in EU policy for smart grids and smart meters, this table shows that these policy aims do not reappear in the standards work.

	Additional functionalities according to Mandate M/441					
ELECTRICITY	Remote reading, meter reading of injected and consumed energy, F1	Two-way communication, F2	Interval metering/ registers, F3	Remote management, F4	Interface with the home/ home automation, F5	Information through webportal/ gateway, F6
E2. Information on actual consumption, on a monthly basis, free of charge						
E3. Access to information on consumption data on customer demand						
E4. Easier to switch supplier, move or change contract						
E5. Bills based on actual consumption						
E6. Offers reflecting actual comsumption patterns						
E7. Remote power capactiy reduction/increase						
E8. Remote activation and deactivation of supply						
E9. All customers should be equipped with a metereing device capable of measuring consumption and injection						
E10. Alert in case of non-notified interruption						
E11. Alert in case of exceptional energy consumption						
E12. Interface with the home						
E13. Software to be upgraded remotely						

Table 2.1: Correlation between M/441 and ERGEG recommendations[111]

[110] CEN/CENELEC and ETSI Smart meter Coordination Group, Final Report (version 0.7-2009-12-10) p.9, retrieved 22 December 2014: http://www.piio.pl/dok/SMCG_Sec0013_DC.pdf
[111] Final Guidelines of Good Practice on Regulatory Aspects of Smart metering for Electricity and Gas, ERGEG: 8 February 2011, p. 35 retrieved on July 24 2014:

Furthermore, the standard does not provide consumers with a display that gives them feedback to change their consumption. This possibility is made available through F6 with a web portal, but the meter itself does not provide this information to the consumer. Thus, the meter itself does not necessarily stimulate energy efficiency.
Similar to the Dutch case, the new Energy Efficiency Directive of 2012[112] describes new the technical functionalities of the meter. In the Dutch case, these requirements were laid down in the Order; whereas in the EU case they were codified in a Directive. In both situations this happened long after the standardization work started.
Article 9 of the new Energy Efficiency Directive summarizes obligations for Member regarding the meter:

"(a) they shall ensure that the metering systems provide to final customers information on actual time of use and that the objectives of energy efficiency and benefits for final customers are fully taken into account when establishing the minimum functionalities of the meters and the obligations imposed on market participants;

(b) they shall ensure the security of the smart meters and data communication, and the privacy of final customers, in compliance with relevant Union data protection and privacy legislation;

(c) in the case of electricity and at the request of the final customer, they shall require meter operators to ensure that the meter or meters can account for electricity put into the grid from the final customer's premises;

(d) they shall ensure that if final customers request it, metering data on their electricity input and off-take is made available to them or to a third party acting on behalf of the final customer in an easily understandable format that they can use to compare deals on a like-for-like basis"

Paragraph (a) seems to imply that national standards need to include a consumer interface for usage information. It clearly states that the objective of energy efficiency has to be taken into account, which is not possible if the consumer does not obtain more information regarding his use than he would otherwise obtain. The functions, moreover, address the security and privacy of the meter. The directive also requires the possibility

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http://www.ceer.eu/portal/page/portal/EER_HOME/EER_CONSULT/CLOSED%20PUBLIC%20CONSULTATIONS/CUSTOMERS/Smart%20metering/CD/E10-RMF-29-05_GGP_SM_8-Feb-2011.pdf.

[112] Energy Efficiency Directive 2012/27, OJ 2012 L 315.

for consumers to be able to keep track of produced energy, even though this does not necessarily have to be provided by the standard smart meter.
Furthermore, the Ecodesign Directive, which we will elaborate on in Chapter 3, was selected to be applicable to smart meter standardization at the end of 2012.[113] Smart meters are part of the priority list of products that need to be aligned with the Ecodesign Directive. The Ecodesign Directive provides a considerably stricter framework regarding the environmental impact of the meter. Next to the above-mentioned functionalities, the Ecodesign Directive sets requirements for the product itself related to, for example, the raw materials used and the lifespan of the meter. A regular meter has a lifespan of approximately thirty years, while the smart meter lasts fifteen years.[114] Replacing all meters of all European households twice as often goes along with a severe environmental impact. This is a typical issue that is not addressed in the mandate and is very unlikely to be addressed by the market parties, as a doubled rate of replacements is beneficial for their business case.

2.6 How this relates to EU smart grid standardization

In both the Dutch and EU cases, the policy aims and requirements for standardization were set significantly later than the request for standardization. In the Dutch case it was five years and in the EU case it was three years after the request to the standardization bodies to develop the standard, that a legal framework for the technical requirements of the meter was introduced. Developing a standard in line with those requirements and subsequently developing meters that comply with the standard costs even more time. In the meantime meters are developed and offered that do not comply with all of the technical requirements. It is therefore crucial that the assignment of standardization comprises a framework that translates the policy aims and requirements into set conditions for the standardization process in order to safeguard those aims and requirements.

The Dutch case shows that in absence of this framework, the standard can result in infringements on these aims and requirements. The standard determined whether the meter contributes to the aim of energy efficiency: the standard meter does not contain a consumer display so that consumers are more aware of their use. Therefore, the meters will be rolled out without this display and, subsequently, the rollout itself does not support the aim of energy efficiency. By not including a display for the consumer the

[113] Commission Staff Working Document: Establishment of the Working Plan 2012-2014 under the Ecodesign Directive, p.5, SWD(2012)434.
[114] Deconinck, G. (2008, 12-15 May) *An evaluation of two-way communication means for advanced metering in Flanders (Belgium)*, presented at IEEE Instrumentation and Measurement Technology Conference 2008, p. 1.

energy efficiency potential of the meter decreased. Of course, these displays can be purchased, but this can include major costs. For example, ENECO one of the Dutch electricity suppliers offers such a display for their consumers. This technology, called Toon, costs € 200 + €75 for installation in 2014. Even worse, ENECO requests a monthly fee of €3,50 for the consumer to obtain access to their data. This means that consumers do not have access to data concerning their own energy use unless they pay.[115]
Additionally, the standard also determined whether the policy requirement of privacy protection was met. The automatic reading of fifteen minutes clearly infringed on the requirement to only use the data for its purpose of maintaining the functioning of the grid.
The EU smart grid standard development is based on a similar mandate without a legal framework that describes the policy objectives or requirements to be met. The exception to this is privacy protection, which the mandate addresses multiple times. Clearly, the EU Commission has become aware of the necessity to make it a prerequisite to ensure this right in the design phase.[116] However, there are still several policy aims and requirements, which we will discuss in Chapter 4, that are not addressed in the mandate. It is therefore possible, that only after smart grid standardization has reached a mature stage, the necessity of a legal framework is discovered; then it will be too late.

2.7 Conclusion

In this chapter, we illustrated that the smart meter standard did not meet the aim of energy efficiency, because it did not provide a display to help the user actually become more energy efficient. The standard also infringed on the policy requirement of privacy protection by sending an automatic reading in an interval of fifteen minutes to the network operator without consent by the user. This interval was not essential for the execution of the network operators' of balancing the electricity grid.
Thus, the case shows that the way in which technology is developed can be consequential for related policy aims and requirements. This can go as far as regulating the users of the technology. First, the way the user was regulated in this case was because the meter itself did not allow the user to become more energy-efficient. Second, the standard infringed upon the users' right to privacy. This role of technology as a regulator is extensively addressed in Lawrence Lessig's theory of "code is law". In Chapter 5 we will discuss this theory and what it means for the standardization of smart grids.

[115] Slightly off topic as the Toon is not a standard, but it is questionable whether this is in line with the requirement of Directive 2009/72/EC, OJ 2009 L 211, Annex 1 art.1 §1j requiring that no extra costs shall be charged for the service of providing the consumer access to their electricity use data in order to regulate their own consumption.
[116] E.g. Commission Communication: Smart Grids: from innovation to deployment, COM (2011)202, p. 7, referring to privacy by design in standardization.

The main problem was that there was no legal framework to safeguard these aims and requirements. Not in the sense of a framework containing the most important aims and requirements for smart meters to be taken into account. This framework was only created after the standard was developed. Nor in the sense of a procedural framework ensuring, for example, the participation of societal stakeholders such as the consumers association. We will address the necessity of a procedural and substantial framework for safeguarding standards in Chapter 6.

3 The legal framework for smart grid standardization

This chapter answers subquestion SQ1, by providing the legal framework on smart grids standardization. In Chapter 6 we use this framework to analyze the extent to which policy aims are currently safeguarded by the legal and regulatory system of standardization. This chapter first and foremost provides a framework for standards in general. Only the final sections specifically address standardization in relation to smart grids.

3.1 Introduction

3.1.1 Standards and smart grids

According to the New Regulation on Standardisation no 1025/2012, standards are "[A] a technical specification, adopted by a recognised standardisation body, for repeated or continuous application, with which compliance is not compulsory".[117] As mentioned in the introduction, the term standard has a broader meaning.

In this chapter, we will discuss the legal framework of standardization in general. To understand what conditions the EU legal framework currently sets for standardization, we will discuss EU law and policy that has an impact on standardization. This is of course first of all standard-specific regulation. Furthermore, we will see that competition law and policy influences standards and standardization in several ways. Finally, will discuss informal guidelines affecting the standardization process. This way, we ascertain which conditions for standardization already potentially safeguard policy aims and requirements.

This chapter starts with a review of the Council Resolution on the New Approach[118] and the New Regulation on European Standardization[119]. The New Regulation on European Standardization went into effect in 2013. We will especially examine its meaning for the status of the standardization mandate, an issue that has not yet been addressed by previous scholars. Subsequently, it describes the framework of competition law and specifically addresses the Guidelines on Horizontal Cooperation.[120] Following this, it explicitly addresses issues of standardization related to intellectual property rights (IPR). It explains the role of fair reasonable and nondiscriminatory (FRAND) terms in the

[117] Art. 2 §1 Regulation No. 1025/2012 on European Standardization, OJ 2012 L 316.
[118] Council Resolution 85/C 136/01 on a new approach to technical harmonization and standards, New Approach, OJ 1985 C 136.
[119] Regulation No 1025/2012 on European standardization, OJ 2012 L316.
[120] Guidelines on the applicability of Article 101 of the Treaty on the Functioning of the European Union to horizontal co-operation agreements, OJ 2011 C11.

European standardization process. This policy is by far the most important policy for countering competition rights infringements.
Apart from the legal framework, we address the internal guides, including the Guidelines on Cooperation between CEN, CENELEC and ETSI[121], and its procedural framework.
Because this research concerns smart grid standardization, we will also describe the framework that is applicable to smart grids specifically. To this extent, we will first address the assignment for standardization for smart grid standards, namely the smart grid standardization mandate M/490.[122] Second, we will discuss the development of Network Codes, which might overlap with standards because of their technical nature. Furthermore, we will briefly address the Eco-Design Directive, as this directive is possibly relevant for smart grid standardization.[123]

3.1.2 Background

Standards have been part of our society for centuries. They are crucial for the functioning of markets. The metric system, for instance, is a standard that has been useful for trade in Continental Europe since the industrial revolution. Standardization has several benefits, and the most obvious benefit is that it leads to economic efficiency and growth.[124] It allows producers to increase economies of scale in production by outsourcing or adapting to each other's processes. With some exceptions, international standards mostly have a positive effect on import and export.[125]
Increasing the amount and quality of information about products shared between vendors and their customers is another advantage of standardization. Standards can represent, for instance, a quality aspect or information about the background of a product. Moreover, regulatory standards can help to incorporate European Union policy in addressing societal challenges, such as climate change, consumer protection, and safety.[126] These standards may, for example, concern toy safety and environmental concerns through labeling standards.[127]

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[121] General Guidelines for the Cooperation between CEN, CENELEC and ETSI and the European Commission and the European Free Trade Association, 28 March 2003, OJ 2003 C 91.
[122] Standardization Mandate to European Standardisation Organisations (ESOs) to support European Smart Grid deployment, Brussels 1st March 2011 M/490.
[123] Eco-Design directive 2009/125/EC, OJ 2009 L 285.
[124] Commission Communication: A strategic vision for European standards, COM(2011)311, p. 1.
[125] Swann, G. (2010) *International standards and trade*, OECD Trade Policy Papers, no.97 OECD Publishing.
[126] Regulation No 1025/2012 on European standardization, OJ 2012 L316
[127] For example, EN 71-4:2013, OJ 2013 C 187 or EN ISO 14024:2000, OJ 2009 C 136.

The EU also has certain policy aims for which it wants to stimulate standardization in general. European harmonization of standards helps to reduce barriers to cross-border trade. According to the Regulation New Regulation on standardisation standards should ensure essential compatibility and interoperability. Moreover, "European standardisation also helps to boost the competitiveness of enterprises by facilitating in particular the free movement of goods and services, network interoperability, means of communication, technological development and innovation. European standardisation reinforces the global competitiveness of European industry [...]".[128]

More recently, standards are of high importance in ICT, especially since the standardization of Transmission Control Protocol/Internet Protocol TCP/IP in the early 1980s for the worldwide-interconnected network, the Internet.[129] Particularly, in these digital environments, it is important to ensure interoperability. For example, a common communication standard can ensure that users of different communication devices all over the world are able to communicate with each other, even if they do not use products made by the same vendor. In the absence of a standard, relying on different vendors would restrict the amount of users one could reach within the network. In that case, the absence of a common interoperability standard would cause the number of providers of a technology to soon be narrowed down to one dominant party. In other words, one company would likely monopolize the market. The other players would not stand a chance once one party gained a significant share of the market. An example of this type of standard is the ".doc" standard for text formatting. The .doc extension used to be a proprietary specification for Microsoft (MS) Word. Because most people have used MS Word as their text processor since the beginning of digital text processing, the .doc format became the dominant format to process text. Users naturally exchange documents, and to do so, a text processor specification is required for them to read and format each other's documents. As a consequence, also users of operating systems other than MS Windows need to purchase MS Word in order to exchange files.[130]

In smart grids, standardization is a crucial phase in their development and introduction. The system needs to facilitate a value chain that ranges from generation to appliances. Moreover, it calls for an integration of knowledge in

[128] Recital 3 Regulation No 1025/2012 on European Standardization, OJ 2012 L 316.
[129] The request for comments was placed at the IETF in 1981 retrieved 5 June 2014: http://www.ietf.org/rfc/rfc793.txt.
[130] Other programs like OpenOffice.org exist that reverse engineered the file format, yet inconsistencies remain that cause mistakes when exchanging the files on other programs.

different disciplines and sectors. The existing automation and protection technology that is embedded in the current grid infrastructure needs to be integrated with ICT-based technology to provide the communication for the smart grid. Together, this gives rise to a large amount of interoperability issues that need to be solved through common standards. For example, the communicated information in smart grids needs to be transmitted in the same format at every connection point in the grid. Therefore, market communication standards are necessary that, for instance, determine the amount of electricity use in each time period. Additionally, standardized units of various types are important, such as common time units to universally exchange data on usage.[131] Moreover, there are multiple players and stakeholders in smart grids, including suppliers of electricity, network operators, end users, and new parties, such as energy service companies (ESCOs). They can all have different and even contradicting interests in smart grid standards.

3.2 The European standardization organizations

There are three official European standardization organizations. In this section, we will provide the background of these organizations. In the following sections, we will describe their role and processes more extensively.

3.2.1 The three organizations

ETSI sets telecommunication standards. It was established in 1988 to provide common standards in the telecommunications sector.[132]

CENELEC addresses electro technical standards. It was established in 1973 in accordance with the Treaty of Rome with the aim of eliminating impediments to trade that are of a technical nature.[133] The National Electro-technical Committees were therefore grouped together in the association of CENELEC.

CEN addresses standards that are neither related to telecommunication nor electro-technical issues. Founded in 1961, it aimed at developing harmonized standards in the EU.

All three organizations are nonprofit, non-governmental organizations that provide a platform for stakeholders to develop standards. The standards are of a

[131] The smart meter case, for example, addressed the interval times of 15 minutes for remote reading.
[132] Recital 6 of Council Resolution on the development of the common market for telecommunications, OJ 1988 C 257.
[133] See also p.1466 of Opinion of Mr Advocate General Warner delivered in Case C123/76 Commission v Italian Republic on 28 June 1977, referring to the first internal regulations of CENELEC.

voluntary nature and, therefore, are not legally binding. Once a standard is completed by one of these organizations, the standard is published in the Official Journal of the European Union. It then becomes a European standard, and all Member States have to implement it as a national standard.
Although CEN and CENELEC are individual organizations, they frequently operate together. They both work with national representation in the sense that their members comprise national standardization bodies. The members have weighted votes corresponding to the size of the country they represent. ETSIs membership, on the other hand, is open to different stakeholders and does not work with national representation. The organization includes over 750 members, including some from outside the EU. The stakeholders are mainly representatives of consultancies, manufacturers and telecom network operators. Some parties have multiple memberships from different countries. Apple for example has one European membership and six of separate Member States. Other parties are for example universities, research bodies and associations.

3.2.2 Structure and procedure

Standardization in CEN/CENELEC has a preset structure.[134] The Technical Board is responsible for the overall standardization program. The Technical Board consists of the President and/or the Vice President(s) and one permanent delegate from each CENELEC member, which are the NSBs. The Technical Board establishes the Technical Committees that work on specific standards. In the meetings of the Technical Committee, national delegates participate, and the committees are chaired by a Committee Secretariat. The Technical Committee can subsequently appoint a Working Group to undertake a specific task within a deadline and is normally terminated by its parent body when the work is completed.
Standardization in ETSI also has a number of set procedures.[135] The General Assembly is the highest authority, determining amongst other things, the ETSI policy and membership. It is assisted by the Board, which oversees the ETSI Work Program. Members of ETSI can join a Technical Body to develop standards, which are overseen by an Operational Co-ordination Group, which reports to the Board.

[134] As is shown on their websites, retrieved on 29 September 2014: http://www.cenelec.eu/dyn/www/f?p=WEB:123 and https://www.cen.eu/about/GovStructure/Pages/default.aspx.
[135] As is shown on their website, retrieved on 29 September 2014: http://www.etsi.org/about/our-structure

3.3 The New Approach to Standardisation

The New Approach to Standardisation was already briefly mentioned in the introduction of this book.[136] It is a way to harmonize standards within the EU, and has been used since the mid 1980s. The New Approach is necessary because when technical regulations are set on a national level without EU coordination, they can restrict the free movement of goods.

> The case of Cassis de Dijon provides a well-known, pre-New Approach case, in which standardization impeded the free movement of goods.[137] In this case Germany held the standard that for fruit liquor to be sold as such, the beverage had to contain at least 25% alcohol. The German government refused the permission to Rewe- Zentral to import the Cassis de Dijon as liquor, as it contained less than the standard of 25%. The ECJ ruled that this constituted a measure of equivalent effect to quantitative restrictions on import and was therefore prohibited.[138]

To avoid incidents in which national standards restrict cross-border trade because of the difference between standards in Member States, certain standards were set already through Directives on an EU level based on the General Programme for the elimination of technical barriers to trade.[139] However, this method of standardization took up considerable effort and time because it was hard to find consensus on sensitive issues.[140] Therefore, this old approach was often too slow to keep up with the development of new technologies. In response, the Council introduced the New Approach to Standardisation. Through this approach harmonized standards concerning quality and safety requirements are developed on a European level, facilitating the completion of the internal market. This way, only the policy requirements are laid down in a New Approach directive through essential requirements, while the technical specifications are left open.[141] The official ESOs are then mandated by the European Commission (the Commission) to transpose certain safety or quality levels set by a directive and its implementing regulation into technical standards.

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[136] Council Resolution 85/C 136/01 on a new approach to technical harmonization and standards, New Approach, OJ 1985 C 136.
[137] Case C12/78 Rewe-Zentral AG v Bundesmonopolverwaltung für Branntwein, ECLI:EU:C:1979:42..
[138] As laid down in article 34 TFEU (then 30 EC)
[139] General Programme of 28 May 1965 for the elimination of technical barriers to trade which result from the disparities between the provisions laid down by law, regulation or administrative action in Member States, OJ 1969 C76.
[140] Schepel H. (2005) *The constitution of private governance : product standards in the regulation of integrating markets,* Portland: Hart Publishing, p. 63.
[141] Annex II of Council Resolution 85/C 136/01 on a new approach to technical harmonization and standards, New Approach, OJ 1985 C 136.

The way in which these essential requirements are presented differs per Directive. The Measuring Instruments Directive, for example, which is also applicable to the smart electricity meters that we discuss in Chapter 4, states the requirements in the Annex.[142] It addresses requirements such as the maximum level for errors or measures to counter corruption of the meter. The new Radio Equipment Directive, which has to be implemented by 2016, is applicable to all radio equipment, save for the exceptions mentioned in the directive.[143] This directive covers a wide range of devices from mobile phones to car door openers. The Commission further enjoys implementing powers to determine certain categories of electronic products that are covered by the directive according to art. 2 §2. The essential requirements are laid down in art. 3, covering various aspects such as avoiding harmful interference, ensuring access to emergency services and the highly debated requirement of common chargers. To note, in some cases, the essential requirements are not addressed, or are only partly addressed in the directive, and are elaborated on in a separate Commission implementing measure. This is the case in the Eco-Design directive, which we will discuss at the end of this chapter.[144]These standards that are developed in line with the directives are published in the Official Journal of the EU and become a European Standard (EN)[145], requiring Member States to adopt them as national standards. Conformity with the standards, therefore, implies conformity with the concerning New Approach directives.[146] The surveillance of conformity is done through CE (Conformité Européenne) marking.[147] Products bearing the CE mark therefore conform to the relevant New Approach directive. Market parties can develop other technologies that do not comply with a New Approach standard, but they will need to prove that they comply with technical requirements of the relevant New Approach Directive. The burden of proof lies with the company deviating from the standard. In other words, they will need to prove that they comply with the directive, and it is not necessary for the regulator questioning the compliance to prove that it does not comply. Collecting evidence that such a deviating standard fulfills the EU requirements is a long and cumbersome activity. Companies rarely take action to prove compliance in practice because it is

[142] Directive 2004/22/EC on measuring instruments, OJ 2004 L 135.
[143] Art. 1§1 Directive 2014/35/EU on radio equipment, OJ 2014 L 153.
[144] E.g. Commission Regulation No 1016/2010 implementing Directive 2009/125/EC of the European Parliament and of the Council with regard to ecodesign requirements for household dishwashers, OJ 2010 L 293.
[145] The official term is European Standard, the abbreviation however stems for European Norm, thus EN.
[146] Annex III of Council Resolution 85/C 136/01 on a new approach to technical harmonization and standards, New Approach, OJ 1985 C 136.
[147] Borraz, O. (2007) Governing standards: the rise of standardization processes in France and in the EU. *Governance*, *20*(1), p. 66.

expensive and complicated and because it requires intensive testing.[148] Market parties will, therefore, simply comply with the standard itself to fulfill the requirements of the directive. Thus, although strictly the standard is not legally binding, the standard becomes de facto binding for market parties.[149]

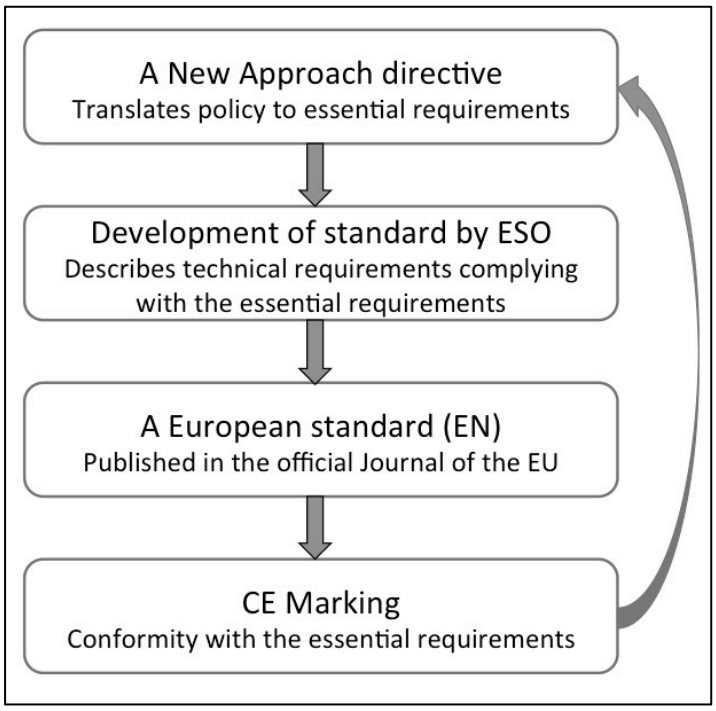

Figure 3.1: Process of developing New Approach standards.

The New Legislative Framework (NLF) follows up the New Approach and most existing New Approach directives are being aligned with the NLF.[150] The main difference is that the NLF addresses the surveillance of compliance with the essential requirements more specifically and homogenizes the application of New Approach directives.[151] The Directives are currently being aligned with the NLF, and the majority will need to be implemented by 2016.

[148] Schepel, H. (2013) The New Approach to the New Approach: The Juridification of Harmonized Standards in EU Law, *Maastricht Journal of European and Comparative Law*, *12*(4), p. 528. Or Winn, J. & Jondet, N. (2008) A "New Approach" to standards and consumer protection, *Journal of consumer policy*, 31(4), p. 646.
[149] We will come back to this issue in Chapter 5.
[150] Decision 768/2008 EC on a common framework for the marketing of products, OJ 2008 L 218. The Explanatory Memorandum of the New Legislative Framework Alignment Packages state that problems arise in the presence of non-compliant products, competitive disadvantages for operators that do comply, the enforcement of non-compliance is unequal, national authorities use different conformity assessments and there are problems with the quality of the notified bodies. E.g. New Legislative Framework (NFL) Alignment Package on Measuring Instruments, COM(2011)769.
[151] Gorywoda, L. (2009) New European Legislative Framework for the Marketing of Goods, *Colum. J. Eur. L.*, *16*, p. 161.

3.4 The New Regulation on European Standardisation

In this part, we describe the basic legislative framework for European standardization from the New Regulation on European Standardisation.
In 2012, a New Regulation on European Standardisation (the New Regulation) was introduced. It has the objective to ensure effectiveness and efficiency in standards and standardization.[152] The Regulation sets rules for cooperation between the ESOs, NSBs, Member States and the Commission. It also establishes rules for both the regular standardization process of European standards and New Approach standards. Additionally, it sets a framework for the identification of technical ICT standards that are eligible for reference in public procurement, finance of the ESOs and the participation of societal stakeholders.[153] It amends several existing standardization policies to address two main problems.
The first problem the New Regulation addresses is that a number of stakeholders are underrepresented in the process. The other problem is that the de jure European standardization process takes far too long. This has been a problem for the Commission since the New Approach.[154] Consequently non-ESOs develop ICT standards conflicting with European standards.[155]
Additionally, the regulation amends and replaces several existing directives without changing their policy. The most important of these is the Information Directive[156], of which we will first discuss the most important aspects as partly adopted in the New Regulation. Smart grids standards are covered by the Regulation, firstly as they are set by the ESOs and secondly as they (partly) concern ICT standards.

3.4.1 The information and notification procedure

First of all, according to art. 3§6 of the New Regulation, the NSBs are not allowed to develop any technical standards that are not completely in line with a European standard in development or completed. Moreover, all conflicting national standards need to be withdrawn after publication of a European

[152] Recital 52 of Regulation No 1025/2012 on European standardisation OJ 2012 L316.
[153] Art.1 Regulation No 1025/2012 on European standardisation OJ 2012 L316.
[154] Egan, M. (2001) *Constructing a European Market: Standards, Regulation, and Governance: Standards, Regulation, and Governance*, Oxford: University Press, p. 212-218.
[155] Proposal for a Regulation on European standardisation, COM(2011)315, p.2.
[156] Directive 98/34/EC laying down a procedure for the provision of information in the field of technical standards and regulation, OJ 1998 L 204.

standard. Furthermore, art. 4 demands that the NSBs and ESOs send their draft standards to ESOs, other NSBs, or the Commission upon request. This notification triggers a standstill period of three months in which the standardization bodies cannot adopt the standard. Within this period, comments can be made, which the standardization bodies need to take into consideration. The comments do not need to be incorporated in the new draft standard. The procedure enables the Commission, ESOs or other NSBs to detect potential barriers to trade. If neither the Commission nor a Member State objects, the standard can go through. In case a barrier is detected, the concerning NSB needs to consult with the ESOs and the European Commission. Another option is that the Commission mandates a European standard on the issue, when it concerns a national standard.

Furthermore, a phase, referred to as the *public enquiry phase*, allows people or organizations that are not part of the process to comment through their NSB, and in their turn, send a national view to the ESOs. This phase is one of the few possibilities for parties that are not part of the European standardization process to comment on the standard. Only the last part of the procedure in which the NSBs comment their views is codified in the New Regulation (art.4). The part where comments can be submitted at the NSBs is laid down in CEN/CENELEC guide 20.[157]

When a Member State fails to notify the Commission of the use of a standard in national law that has a restrictive effect on trade, the national concerned provision will be unenforceable towards individuals.

> Such was the case in the dispute of CIA Security International SA v. Signalson. SA & Securitel SPRL. In this case the Belgium government had neglected to inform the Commission of technical requirements for alarm systems.[158] In this case, even though the alarm system in question did not comply with the requirements set by Belgium law, they could not be held back from selling their product on the Belgium market, as the Belgium government had not notified the Commission of the standard.

This system of notification triggered 12.500 notifications from 1988 to 2010 including 366 potential barriers identified by Member States and 402 by the Commission under the Information Directive.[159] The procedure, therefore, has quite a large impact on national technical regulation.

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[157] CEN/CENELEC Guide 20, Guide on membership criteria of CEN and CENELEC edition 2, 2012-06, retrieved on 19 August 2014: http://www.cencenelec.eu/standards/Guides/Pages/default.aspx.
[158] Case C-194/94, CIA Security International SA v Signalson SA and Securitel SPRL, ECLI:EU:C:1996:172..
[159] De Brito, A. C., & Pelkmans, J. (2012) Pre-empting technical barriers in the Single Market, *CEPS Policy Brief*, 277, p. 4.

The New Regulation directly requests the NSBs to present annual work programs on standardization and obliges them to respond swiftly to reactions of the Commission or other NSBs on their work.[160] Contrary, the Information Directive only allows for addressing the Member State and not the NSB. This difference exists because a regulation creates direct effect, while a directive can only address Member States. Therefore, the NSBs now have the responsibility of providing information on standardization next to Member States. The Information Directive still obliges the Member States to communicate all their requests for standardization to the NSBs to the Commission.

3.4.2 The societal stakeholders in standardization

Another problem New Regulation addresses is that of the inclusion of societal stakeholders. For non-commercial interests to be represented in the process, four official European groups of stakeholders in standardization are eligible according to the Annex of the New Regulation. The societal stakeholders are organizations that represent specific interests in standardization processes and are recognized by the Commission. They are ANEC (consumers), ECOS (environment), ETUI[161] (trade unions) and stakeholders representing small and medium-sized enterprises (SBS). These stakeholders experience obstacles to participate fully in the process because they lack the means and expertise.[162] Industry representatives of large companies in the process obviously have significantly more expertise and financial means to sufficiently participate in the process than societal stakeholders and SMEs. Societal stakeholders can only participate in a small number of technical committees and working groups, because there are simply too many to cover all of them.[163] Moreover, the committee secretariat is almost always a member from the industry, whereas the societal stakeholders rarely chair a committee.[164]

The New Regulation requests that the ESOs encourage and facilitate the inclusion of societal stakeholders in the standardization process. This includes

[160] Art. 3 of Regulation No 1025/2012 on European standardization OJ 2012 L316.

[161] Officially trade unions are referred to as "social" stakeholder, yet in this research we will include them in societal stakeholders.

[162] Van Elk, K., & van der Horst, R. Access to Standardization–Study for the European Commission, Enterprise and Industry Directorate-General, p. 9, retrieved on 3 October: http://ec.europa.eu/enterprise/policies/european-standards/files/standards_policy/access_to_standardisation/doc/access_to_standardisation_study_eim_en.pdf.

[163] Van Elk, K., & van der Horst, R. (2009) *Access to Standardization–Study for the European Commission,* Study for the European Commission, Enterprise and Industry Directorate-General, Zoetermeer, p. 66, retrieved on 3 October 2014: http://ec.europa.eu/enterprise/policies/european-standards/files/standards_policy/access_to_standardisation/doc/access_to_standardisation_study_eim_en.pdf.

[164] Egan, M. (2001) *Constructing a European Market: Standards, Regulation, and Governance: Standards, Regulation, and Governance*, Oxford: University Press, p. 144.

involvement the process and financial support for small and medium-sized enterprises (SMEs) and societal stakeholders. The EU requirements and financial support of the societal stakeholders is described in Annex III of the New Regulation. The New Regulation also specifically requests the NSBs to encourage the inclusion of SMEs in the process.

In line with the New Regulation, CEN/CENELEC introduced a new guide on membership criteria. It is a reference document based on "a voluntary approach of self-imposed requirements".[165] The guides are informative documents that are not legally binding. The guide addresses more specifically the involvement of societal stakeholders.

Previous legislation did not address the involvement of societal stakeholders in such detail. It is, therefore, definitively an improvement with regards to the inclusion of stakeholders other than the relevant market parties. It provides an opportunity to counterbalance the commercial interests of these parties with interests that are also relevant for EU wide policy, such as environmental protection, consumer protection and improving the position of SMEs. Regardless of these stimulations to include societal stakeholders and SMEs in the process, they are not permitted to vote in CEN and CENELEC. Because of the system of national representation, only NSBs can vote. The New Regulation, therefore, does not bestow voting rights on the societal stakeholders or SMEs. It should also be noted that the societal stakeholders could, and did, already join the standardization processes prior to the New Regulation. They also already received Union financing in the previous system.

Requesting NSBs to include SMEs in the process is an important step because NSBs do not have equal procedures on this matter. Nonetheless, this provision does not see to the inclusion of societal stakeholders. Finally, "encouraging participation" and formalized long-term financing will, in itself, not mean that the societal stakeholders will become capable of effectively participating in each standardization process. The NSBs are required to send annual reports to the ESOs regarding their activities to stimulate inclusion of SMEs in accordance with art. 6 §3 of the New Regulation. NSB reports show that measures of introducing an SME forum or the availability of virtual meetings, which reduces travel expenses, have been taken.[166] Nonetheless, there is not yet any data available as to the impact on the participation of SMEs in practice.

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[165] CEN/CENELEC Guide 20, Guide on membership criteria of CEN and CENELEC edition2, 2012-06, retrieved on 19 August 2014: http://www.cencenelec.eu/standards/Guides/Pages/default.aspx

[166] E.g. DIN, (2014) European Standardization: A Successful Model of Public-Private Partnership, Berlin, retrieved on 28 November 2014: http://www.din.de/sixcms_upload/media/2896/DIN_Stand_Package_Report_FINAL.pdf

3.4.3 Fora and consortia standards

The third aspect of standardization the New Regulation addresses addresses the conflict between EU official standards and informal standards, which are referred to as *fora and consortia standards*. One of the reasons ICT standards are set in these fora and consortia is that the official ESOs often lack relevant expertise and are rather slow in their process of standardization. When the process of harmonizing standards takes too long, the industry responds by developing informal standards. These standards, especially when it concerns a New Approach domain, might not meet the EU requirements of, for example, safety.[167] Because it was previously only allowed to refer to official European standards in public procurement procedure, authorities refrained from using products standardized by fora and consortia. This caused a lack of cross-border interoperability standards from different organizations.

The New Regulation on European Standardisation attempts to counter these problems in different ways.

First of all, by imposing new requirements concerning deadlines and notification systems for the ESOs, this is supposed to speed up the process and also to provide more transparency in their work. In addition, the notification obligation should allow more responses from other organizations that are not part of the process.

Secondly, the New Regulation allows the Commission to identify informal standards in public procurement procedures, provided they comply with criteria determined in Annex II of the Regulation.[168] This means that ICT-standards from non-ESOs can be permitted in public procurement processes, provided that they comply with amongst others the World Trade Organization (WTO) principles of openness, transparency and consensus for international standardization processes.[169] The procedure for the adoption of fora and consortia standards is described in CEN CENELEC Guide 23.[170]

3.5 The legal and informal framework of CEN, CENELEC and ETSI standardization

[167] Commission Staff Working paper: Impact assessment accompanying document to the proposal on the New Regulation, SEC(2011)671, p. 13.
[168] Art. 13-14 of Regulation No 1025/2012 on European standardization OJ 2012 L316.
[169] Annex II of Regulation No 1025/2012 on European standardization OJ 2012 L316.
[170] CEN/CENELEC Guide 23 Adoption of third-party specifications as European Standardization Publications edition 2, 2013-11-06, retrieved on 19 August 2014: http://www.cencenelec.eu/standards/Guides/Pages/default.aspx.

The ESOs are important players in smart grid standardization. Their work is derived from the Commission standardization mandate M490 on smart grids.[171] The mandate is the official request for standardization by the Commission to the ESOs. We will discuss the smart grid standardization mandate specifically in section 3.7. In this section we will discuss the policy to which the ESOs specifically need to abide. This policy originates from legal, formal and informal documents.

3.5.1 The procedure of standardization for the ESOs

The New Regulation describes in different articles how the preparation of standardization work takes place. First of all, the Commission sets out annual Union work programs in which it defines objectives and policies for standardization and it consults with relevant stakeholders and the ESOs (art. 8 §2 -§4). Furthermore, the Commission can request that the ESOs develop a standard (art. 10 §1). Apart from the New Regulation, the ESOs work with internal guides. These guides address procedural issues such as the involvement of interests for disabled people.

3.5.1.1 The standardization mandate

The Commission assigns the ESOs to develop a standard, performed in the form of a standardization mandate, referred to as a "standardization requests" in art. 10 of the New Regulation.[172] Smart grid standardization is also based on this type of mandate. The ESOs and societal stakeholders are consulted in the development of the mandate.[173] Before the New Regulation the mandate was assumed to have the status of a private contract.[174] The New Regulation on the one hand seems to consent to this status, as the ESOs are free to accept the request according to art. 10 §3. However, the New Regulation additionally seems to bestow more public status on the mandate. It first of all invokes the comitology procedure[175] to the drafting of the mandate. Article 10 §2 in conjunction with the procedure laid

[171] Standardization Mandate to European Standardisation Organisations (ESOs) to support European Smart Grid deployment, Brussels 1st March 2011 M/490.
[172] This procedure will be reviewed in the beginning of 2015 according to art. 25 of the New Regulation on Standardizaiton.
[173] DG Enterprise and Industry: Vademecum on European Standardization part II: Role and preparation of mandates, p. 15, retrieved on 14 October 2014: http://ec.europa.eu/enterprise/policies/european-standards/files/standards_policy/vademecum/doc/preparation_of_mandates_web_en.pdf.
[174] Schepel H. (2005) *The constitution of private governance : product standards in the regulation of integrating markets,* Portland: Hart Publishing, p. 230-231, or Van Eecke, P. et al. (2007) *EU Study on the specific policy needs for ICT standardization,* Report for the EU Commission, Brussels, p. 64, retrieved on 23 December 2014: http://ec.europa.eu/enterprise/sectors/ict/files/full_report_en.pdf.
[175] In comitology procedures the Commission exercises its implementing powers, assisted by Member States' representatives in committees.

down in article 22 §3, which refers to article 5 of Regulation (EU) No 182/2011 and which, in turn, invokes the examination procedure for implementing acts and, therefore, the comitology procedure. Thus, the New Regulation refers to the comitology procedure for the drafting of mandates. Recital 11 of the this comitology regulation explains that the examination procedure "should in particular apply for the adoption of acts of general scope designed to implement basic acts and specific implementing acts with a potentially important impact. That procedure should ensure that implementing acts cannot be adopted by the Commission if they are not in accordance with the opinion of the committee, except in very exceptional circumstances, where they may apply for a limited period of time. The procedure should also ensure that the Commission is able to review the draft implementing acts where no opinion is delivered by the committee, taking into account the views expressed within the committee."

Before the New Regulation, art. 6 §3 and 4 of the Information Directive referred to a Standing Committee that needed to be consulted in drafting standardization mandates. Contrary, by referring to the comitology procedure for implementing acts, the New Regulation appears to change the status of the mandate. Article 291 §2 Treaty on the Functioning of the European Union TFEU concerning implementing acts states that "[w]here uniform conditions for implementing legally binding Union acts are needed, those acts shall confer implementing powers on the Commission". The fact that the acts confer implementing powers on the Commission makes it unlikely that this refers to mere contracts. Additionally, art.10 §2 refers to mandates as "the decisions", indicating that the legal status of the mandate is actually a Commission decision, and not a contract. Third, the mandates that have been developed under the New Regulation for Standardization are referred to as "Commission Implementing Decisions".[176] According to art. 288 TFEU "[a] decision shall be binding in its entirety. A decision which specifies those to whom it is addressed shall be binding only on them". The standardization mandates therefore need to be interpreted as a Commission Decision that is binding in its entirety.

In all probability, the standardization request contains two parts. One part is the decision that is developed in line with the examination procedure of the comitology approach. This part is the mandate, which sets the requirements with which the standard needs to comply, and as such is a decision. The second part,

[176] E.g. Commission implementing decision on deciding to make a standardisation request to the European standardisation organisations pursuant to Article 10 (1) of Regulation (EU) No 1025/2012 of the European Parliament and of the Council in support of implementation of the EU Strategy on Adaptation to Climate Change, C(2014)3451.

which art. 10 §3 refers to, is a contract that needs to be accepted by the ESOs to take up the standardization work.
In Chapter 6 we will explain in further detail what this altered status exactly means for the standardization of smart grids.

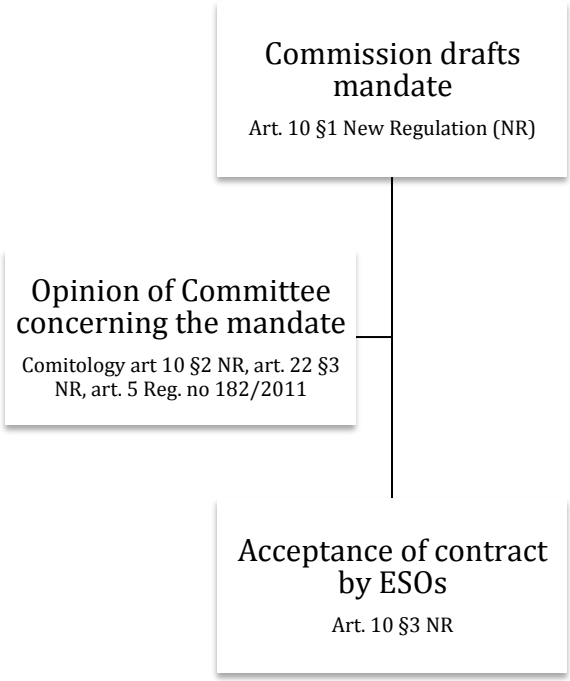

Figure 3.2: Overview of the standardization mandate process in general.

The Commission states the policy objectives of the standard in the mandate (art. 10 §1). Furthermore, the mandates address practical issues, such as deadlines and financing of the standards. The requirements of this mandate form the sole substantial legal requirements for the standard, unless it concerns a New Approach standard.[177]
The involvement of the commission from the moment of acceptance of the mandate to the submission of reference to the Commission is not laid down in legislation, except for an obligation of the ESOs about undertaken activities, art. 10 §5. The Commission is not involved in the technical decisions made in the technical committees.[178] Nonetheless, the General Guidelines for Cooperation between the ESOs, the European Commission and the European Free Trade Association (EFTA) (Cooperation Agreement) state that ESOs should "maintain

[177] Schepel H. (2005) *The constitution of private governance: product standards in the regulation of integrating markets,* Portland: Hart Publishing , p. 240.
[178] DG Enterprise and Industry: Vademecum on European Standardization part II: Role and preparation of mandates, p. 5, retrieved on 14 October 2014: http://ec.europa.eu/enterprise/policies/european-standards/files/standards_policy/vademecum/doc/standards_setting_governance_ev_en.pdf.

a dialogue" with the Commission and EFTA during the standardization process.[179] This Cooperation Agreement forms a type of self-regulatory document for standardization. It provides a framework for standardization, stating the expectations between the parties. The document is not legally binding.[180] The Cooperation Agreement recognizes that standardization has acquired a high political profile.

CEN and Cenelec also have 28 internal guides, of which the Cooperation Agreement is one. These guides address procedural issues varying from the distribution and sales of standards to the incorporation of child safety in standards.

3.5.2 Conformity with policy aims of the standard

The extent to which the Commission verifies whether standards comply with their policy requirements is quite ambiguous. The New Regulation first of all, states in article 10 §1 that standards need take into account "policy objectives clearly stated in the Commission's request". This suggests that the mandate needs to clearly identify the relevant policy objectives. Furthermore art. 10 §6 that the Commission shall publish the standard in the Official Journal when it "satisfies the requirements which it aims to cover and which are set out in the corresponding Union harmonisation legislation". This implies that before publication the Commission will review the standard with respect to its conformity with the policy aims. Moreover, art. 10 §5 states that the Commission together with the ESOs review the standards to determine whether they comply with the mandate. The contents of the standards are under the entire responsibility of the ESOs. In practice the Commission does not test the compliance with the mandate or essential requirements of the New Approach directives.[181] Guidance documentation of the Commission suggests that the dialogue between the ESOs and the Commission helps ensure that the aims are addressed sufficiently.[182] It also explicitly stresses that the Union harmonization legislation does not provide for a procedure under which the Commission should systematically approve or verify standards, while the New Regulation suggests some level of verification.

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[179] General Guidelines for the Cooperation between CEN, CENELEC and ETSI and the European Commission and the European Free Trade Association, 28 March 2003, OJ 2003 C 91.

[180] Commission Staff working Document: The challenges for European standardization, SEC(2004)1251, p. 7.

[181] Hofmann, H. et al. (2011) *Administrative Law and Policy of the European Union Administrative Law and Policy of the European Union*, Oxford: University Press, p.601.

[182] European Commission (2014) Guide on the implementation of EU product rules, p. 28 retrieved 25 March 2014: http://ec.europa.eu/enterprise/policies/single-market-goods/files/blue-guide/guidepublic_en.pdf.

Naturally standardization, and especially smart grid standardization, requires a high level of technical expertise. A level of expertise, which the Commission cannot possibly match. The influence of the experts on the outcome of the standard is therefore great.

Apart from the involvement of the Commission, article 11 contains an option of formal objections, providing the European Parliament with a possibility to inform the Commission if, in its view, the standard does not comply with the aims for the standard. This possibility has been used five times since the New Regulation went into effect on January 1st 2013. All five objections addressed a New Approach standard related to safety issues. The objections stated that the standard did not meet the requirements set out in the concerned directive.[183] At the time of writing in December 2014 there had not yet been any Commission decisions in response to these objections.

To note, the ESOs can also draft standards on their own initiative without the initiative of the Commission or on the basis of an international standard (IEC/ISO). Although the Commission did not initiate the standard, it will carry the status of European Standard, after publication in the Official Journal.

3.5.3 Relations between the ESOs and the international standardization organizations

The relations between the European and international standardization organizations CEN and CENELEC respectively the International Organization for Standardization (ISO) and International Electrotechnical Commission (IEC) are governed by separate agreements. The Vienna Agreement coordinates between CEN and ISO.[184] The Dresden Agreement covers the coordination between CENELEC and IEC.[185] These agreements intend to avoid duplicates, for example, by requiring international standards to be transferred into national standards.

[183] The objections are against standards EN 474-1:2006+A3:2013 (earth moving machinery), EN 1384:2012 (helmets for equestrian activities), EN 1621-4:2013 (motorcyclists protective clothing against mechanical impact), EN 60335-2-9-2003 (household and similar electrical appliances), and EN 60335-2-15-2002 (also household and similar electrical appliances).

[184] Agreement on Technical Co-operation between ISO and CEN, retrieved 21March 2014: http://isotc.iso.org/livelink/livelink/fetch/2000/2122/3146825/4229629/4230450/4230458/01__Agreement_on_Technical_Cooperation_between_ISO_and_CEN_(Vienna_Agreement).pdf?nodeid=4230688&vernum=-2.

[185] IEC - CENELEC Agreement on Common planning of new work and parallel voting retrieved 31 March 2014: ftp://ftp.cencenelec.eu/CENELEC/Guides/CLC/13_CENELECGuide13.pdf.

3.6 Competition law and intellectual property rights

Because standards, with the exception of de facto standards, consist of an agreement between different market parties, there is an inherent threat for competition. These agreements potentially result in exclusion of competing technologies of vendors that had no part in the standardization process. Moreover, parties can have IPRs on essential parts of the standards and when the licensing of these rights is discriminatory or when unreasonably high royalties are demanded, these IPRs can also obstruct competition by other parties.
Regarding standardization, there is a legal and policy framework in place to withstand these risks of obstructions to competition. In this section, we will discuss both the general competition law framework, including cases before the Commission and European Court of Justice ECJ, and the policy framework against unreasonable terms of licensing standard essential IPRs, the FRAND terms.

3.6.1 The Guidelines on the Applicability of Article 101 of the Treaty on the Functioning of the European Union to Horizontal Co-operation Agreements [186]

> Articles 101 and 102 TFEU pursue the aim of effective competition on the market. Article 101 §1 prohibits agreements that could disrupt free competition in the internal market. It states that "[t]he following shall be prohibited as incompatible with the internal market: all agreements between undertakings, decisions by associations of undertakings and concerted practices which may affect trade between Member States and which have as their object or effect the prevention, restriction or distortion of competition within the internal market []". Art. 101 §3 provides an exemption in the case these agreements support economic progress.
> Art 102 TFEU states that "[a]ny abuse by one or more undertakings of a dominant position within the internal market or in a substantial part of it shall be prohibited as incompatible with the internal market in so far as it may affect trade between Member States."

Section 7 of the Guidelines on the Applicability of Article 101 of the Treaty on the Functioning of the European Union to Horizontal Co-operation Agreements (the Guidelines on Horizontal Cooperation) addresses anti-competitive behavior and its effects in standardization.[187] The Guidelines on Horizontal Cooperation on Horizontal Cooperation form a document that clarifies the cases in which

[186] Guidelines on the applicability of Article 101 of the Treaty on the Functioning of the European Union to horizontal co-operation agreements, OJ 2011 C11.
[187] Wijckmans, F. & Tuytschaever, F. (2011) *Vertical Agreements in EU Competition Law*, Oxford: University Press: New. York, p. 8

horizontal agreements are prohibited on the basis of EU competition law. Often, standards promote technical and economic progress, in which case they are exempted from the prohibition through art. 101(3).[188]

The Guidelines on Horizontal Cooperation declare that the primary objective of a standard is providing a definition of quality or technical requirements.[189] However, the Guidelines on Horizontal Cooperation also state that when standards are used within a broader agreement to exclude competitors, the standard is assumed to restrict competition.

The Guidelines on Horizontal Cooperation also describe when a standard is assumed not to have any restrictive effects on competition. This is the case when standardization is unrestricted and transparent and is established on the basis of fair, reasonable and non-discriminatory (FRAND) terms.[190] The FRAND policy concerns the terms under which the patents that are referred to in standards are licensed, and therefore does not address procedural requirements for standardization. In section 3.6.6 we will elaborate on these terms.

There is usually no infringement, when the process is open to all parties. Moreover, there can be justifiable reasons for excluding certain parties, for example if it would cause significant inefficiencies if the parties would participate.[191]

The Guidelines on Horizontal Cooperation are not legally binding, yet they are meant as guide to assess whether a horizontal cooperation agreement is prohibited.[192] They are mainly intended for businesses to assess the compatibility of their agreements with article 101.[193] The Guidelines on Horizontal Cooperation thus explain how provisions 101-102 TFEU should be interpreted when it concerns standardization. Nonetheless, as the Guidelines on Horizontal Cooperation are non-binding and only describe situations in which standards likely infringe on competition, the prerogative of the European Court of Justice remains the right to interpret the provisions in a way it considers fit remains, and the ECJ is not bound by the Guidelines on Horizontal Cooperation in doing so.

There are situations in which standards are possibly not covered by art. 101 §3 TFEU and comprise an infringement on competition. We discuss these situations here. Nonetheless, actual infringement always needs to be assessed on a

[188] The Guidelines on Horizontal Cooperation, §7.3.1.
[189] Ibid. §7.1.
[190] The Guidelines on Horizontal Cooperation §7.3.3.
[191] Ibid. §7.3.3 and 7.4.2.
[192] Maher, I. (2011) Competition law and transnational private regulatory regimes: Marking the cartel boundary. *Journal of Law and Society*, *38*(1), p. 129-130.
[193] The Guidelines on Horizontal Cooperation, art. 7.

case-by-case basis and, therefore, it cannot be determined on a general basis if a standard does or does not infringe on competition.

A case which is likely to give rise to competition issues for instance, arises when standardization agreements entrust certain bodies with the exclusive right to test compliance with the standard, even if there might be justifications to do so.[194] Similarly, the situation where companies engage in anti-competitive discussion during the standardization process and thus reduce or eliminate price competition, can lead to an infringement.[195] This is also the case when standards oblige parties to exclusively use a particular standard, especially when certain parties are unjustifiably excluded from the process.[196]

In addition, standards should only cover aspects that are minimally necessary for technological compatibility, interoperability and quality. When different technical options are available to design one standard, it must be objectively justifiable why one option is chosen over the other. If the standard, for example, without objective justification, excludes one specific party that would otherwise comply with the standard, the standard probably leads to anti-competitive results.[197] Finally, there is the situation in which companies are restricted from obtaining effective access to the result of the standardization process, in other words, the standard itself. Such cases are expected to amount to an infringement.[198]

In the end, in each case, an individual assessment is required whether the efficiency gains outweigh the restrictive effects on competition. It is, therefore, not possible to provide an exhaustive list of situations of impermissible restrictions on competition through standardization. In the next section, we will examine five cases of competition infringements through standardization dealt with by the Commission, to provide more clarity on when a standardization process is anti-competitive.

3.6.2 Cases of competition infringements[199]

To better understand how the articles 101 and 102 TFEU are applied in relation to standards, we will study relevant cases brought before the Commission and the ECJ, which concern an infringement in competition through standardization, starting from the older cases and ending with more recent ones. We will refer to

[194] Ibid. §7.4.2.
[195] The Guidelines on Horizontal Cooperation §7.3.1.
[196] Ibid. §7.3.1.
[197] Ibid. §7.5.
[198] Ibid. §7.3.1.
[199] Guidelines on the applicability of Article 101 of the Treaty on the Functioning of the European Union to horizontal co-operation agreements, OJ 2011 C11.

the current articles of the TFEU, which means that art. 81 and 82 (old) will be referred to as 101 and 102 TFEU in order to make references more comprehensible.
By describing these cases we attempt to illustrate the scope of competition law effects standardization in the EU.[200]

3.6.2.1 The X/Open group case[201]

The first time the European Commission had to decide on a matter of standards was the X/Open group case of the late 1980s. At that time, there was no common application environment standard for UNIX. Therefore, end users were locked into one vendor because they could not use their programs developed on one system on a system from another manufacturer. Hence, the X/Open group decided to develop one common standard agreement to solve this issue. Some of the most important corporations in Europe and the US of that time were involved in the process, such as Siemens, DEC, Philips and Unisys. The process was only open to major players, those with a minimum revenue of US $500.000.000 in the information technology industry, with the exception for applicants that somehow had special attributes that would contribute to the standard. The question at hand was whether the agreement between market parties establishing a common application environment for UNIX software restricted competition in light of art. 101§1. The restrictions on participation to the process could instigate implications for competition, as certain players were excluded from the process. These players were, first of all, unable to influence the outcome. Second, players had an information deficit as the standard would only be made publically available after completion. Thus, non-members could suffer a disadvantage because they could not anticipate the standard and, therefore, lagged behind the parties that were involved the standardization process.[202] Nonetheless, the Commission decided that this disadvantage was easily outweighed by the advantages for economic growth through the wider availability of software and greater flexibility for software from different sources as in art. 101 (3). For one, the standard promoted technical progress. Moreover, it would in all likelihood benefit the consumer creating a wider selection of software. Furthermore, the discrimination between participants was justified because including all stakeholders would lead to significant inefficiencies, as discussed in

[200] The first four cases are the most prominent cases of competition in relation to standardization. As the standards that this research concerns are standards developed within the ESOs, we added the last case as this case concerns an ESO standard.
[201] § 46 Commission Decision 87/69/EEC IV/31.458 - X/Open Group, OJ 1987 L 35.
[202] Commission Decision 87/69/EEC IV/31.458 - X/Open Group, OJ 1987 L 35, §32.

the previous section concerning the Guidelines on Horizontal Cooperation. Finally, competition was not eliminated as the members would offer products in competition with each other and with similar products.
This case is a clear example of a situation where efficiency gains prevail over participation and transparency of the process. Certain parties were excluded and could not access details about the standard before the standard was finished. For competition it was considered to be more important that a standard was created quickly than that all market parties had an equal position in participation and access to the outcome.

3.6.2.2 The case of IMS Health[203]

In the case of IMS Health, NDC Health submitted a claim before the Commission regarding the fact that IMS Health refused to give NDC Health a license for the use of a structure for the regional sale in the pharmaceutical industry (called the 1860 brick structure), based on arts. 101 and 102 TFEU. This brick structure was used to determined geographic distribution areas by doctors and pharmacies. Next to that, the *Landgericht Frankfurt* requested a preliminary ruling of law to the European Court of Justice (ECJ) concerning the breach of competition in this case. The structure had obtained the status of a de facto standard, and the use of the structure was vital for NDC to compete in the market.
In interim measures, the Commission ruled that IMS Health was guilty of abusing its dominant market power as forbidden in art. 102 TFEU, by not providing NDC Health a license for the use of the structure.[204] After interim measures, NDC, for the first time succeeded in closing contracts with some larger pharmaceutical companies. Thus, there was no longer a proven urgency requiring the prevention of irreparable damage to NDC. The Commission, therefore, withdrew the interim decision in 2003 as NDC was now a competitor and the threat of extinction of NDC, which caused the threat for the public interest in competition, was no longer valid.[205]
In the ECJ ruling the Court explained that in certain cases, when the entity requesting the license will provide a new product for which consumers potentially have a demand, a license needs to be granted.[206] In this ruling it developed four

[203] Commission Decision relating to a proceeding pursuant to Article 82 of the EC Treaty, OJ 2002 L 59.
[204] Ibid.
[205] Commission Decision: relating to a proceeding pursuant to Article 82 of the EC Treaty, interim measures, OJ 2003 L 268.
[206] Case C-418/01, IMS Health v NDC Health, ECLI:EU:C:2004:257

conditions that have to be met in order for the refusal to grant a license to be considered an abuse of dominant position. It first states whether the refusal to license depends on whether the protected structure is indispensable to the marketing of the product. It then requires the following three conditions to be met:

- "the undertaking which requested the licence intends to offer, on the market for the supply of the data in question, new products or services not offered by the owner of the intellectual property right and for which there is a potential consumer demand;
- the refusal is not justified by objective considerations;
- the refusal is such as to reserve to the owner of the intellectual property right the market for the supply of data on sales of pharmaceutical products in the Member State concerned by eliminating all competition on that market[207]."

The Court subsequently refers the decision back to the German court to decide whether the criteria are met.

This case thus shows that refusal of access to a standard needs to meet strict conditions in order for it to be considered as an abuse of a dominant position.

3.6.2.3 The case of Microsoft v. Commission

The notorious Microsoft case dealt with an infringement of art. 102 TFEU. Microsoft refused to make essential standards for their server operating system available to competing Sun Microsystems and, therefore, made interoperability with new technology impossible. Applications from other companies could not be added, and users were bound to use applications owned by Microsoft. In addition, Microsoft made the use of Windows Client PC Operating System conditional on the simultaneous acquisition of Windows Media Player. The Commission ruled that both activities constituted an abuse of dominant market power by Microsoft. The Commission did not strictly apply the same conditions as set in IMS Health case. It ruled that refusing transparency of the standards that were necessary to stay on the market threated to stifle competition, and to restrain innovation by other companies in the network operating system market without objective justification. Its dominant position in the relevant market was established by their market share in PC operating systems of more than 90% at that time. The Commission decided that Microsoft should make the standards at issue available under reasonable and non-discriminatory (RAND) conditions to

[207] §52 Case C-418/01, IMS Health v NDC Health, ECLI:EU:C:2004:257

companies active in the network operating system market.[208] After Microsoft did not comply with the Commissions' requirements, Microsoft was fined 899 million Euros.[209] The European General Court upheld the decision when Microsoft appealed the decision of the Commission, but the amount of the fine was slightly lowered due to a miscalculation by the Commission.[210]
Just as the IMS Health case, this case concerned a de facto standard, which the dominant party refused to license. In this case the threat of stifling competition created by not licensing the standard was such that licensing was considered necessary.

3.6.2.4 The case of Rambus Inc.[211]

The fourth case is related to the abuse of a dominant market position through intentional deceptive conduct during the standardization process by not disclosing patents. In the case of Rambus Inc., Rambus did not disclose the existence of patents during the standardization process, but only disclosed the patents after the standard was adopted. These patented technologies were essential to the standards. Moreover, Rambus held a dominant position on the market for dynamic random access memory (DRAM) interface technology. This practice is a form of "patent ambush" as we will discuss in more detail in the following section. In a statement of objections in 2007, the Commission concluded that certain practices might constitute an abuse of dominant position under art. 102 TFEU. In this case, the abuse lies in the fact that Rambus engaged in intentional deceptive conduct in the context of the standard-setting process. The Guidelines on Horizontal Cooperation require the disclosure of standard essential intellectual property rights (IPRs) up front. Rambus subsequently claimed unreasonable royalties for the use of their patent, which also constituted an abuse of dominant market position. Their patenting practices did therefore not abide by FRAND terms. In response, Rambus lowered its royalty rates and committed itself to a maximum rate for future royalty rates to provide new entrants to the market a clear perspective of costs. Because of these commitments, there were no further grounds for the Commission to pursue its action.

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[208] Commission decision relating to a proceeding pursuant to Article 82 of the EC Treaty and Article 54 of the EEA Agreement against Microsoft Corporation, OJ 2007 L 32.
[209] Commission Decision fixing the definitive amount of the periodic penalty payment imposed on Microsoft Corporation, OJ 2009 C 166.
[210] Case T-167/08 Microsoft v Commission, ECLI:EU:T:2012:323.
.
[211] Commission decision relating to a proceeding under Article 102 of the Treaty on the functioning of the European Union and Article 54 of the EEA Agreement, OJ 2010 C 30.

Just as the X/Open Group case, this concerned a standard set in the context of standard setting with multiple parties. It also concerned the process itself. In this case the behavior of purposefully keeping essential IPRs secret during the process was considered an abuse of the dominant position. It brought disadvantages, not only to parties that were not part of the process, but especially to those that were part of it, as they were bound by the standard and needed to pay royalties which they did not anticipate. In section 3.6.3 we will elaborate on what practices are unacceptable under FRAND terms.

3.6.2.5 The case of EMC Development[212]

Finally, as this research concerns standardization within the ESOs, we also discuss the one case that dealt with the process of standardization in an ESO.

The case of EMC concerned a complaint of EMC Development, a cement-producing company. They argued that the EN-197-1 standard for cement favored Portland Cement –who chaired the technical standardization committee-, and excluded alternative products from the market. Because EMC's cement was energetically modified, it did not satisfy the requirements of the standard and, therefore, they could not obtain a CE marking through compliance with the standard. If the standard would have been performance based, instead of descriptive in the sense that it prescribed material to be used, EMC Development could have complied with the standard. As discussed earlier on in this chapter, the inability to obtain a CE marking practically results in the inability to market a product. EMC Development also claimed that they had not obtained sufficient access to the standardization process. Furthermore, the cooperation between CEN and Cemburo, the European Cement Association, led to an illegal horizontal cooperation. The Commission ruled that there was no evidence that Portland Cement company was favored and that the possibility of participation for ECM Development was provided for at the national level, through the possibility of being involved in the national standardization process. EMC Development could not prove that it was unjustifiably excluded. There were therefore no restrictions for EMC Development to participate in the standardization process and consequently the process was not discriminatory. The General Court[213] and the Court of Justice[214] upheld this decision. None of them, however, addressed the question of whether a performance based standard

[212] Case C-367/10P in appeal to Case T-432/05, EMC Development AB v European Commission, OJ 2011 C 252.
[213] Judgment of the General Court in case T-432/05, EMC Development v the European Commission, ECLI:EU:T:2010:189.
[214] Order of the Court in case Case C-367/10P, EMC Development AB v European Commission, OJ 2011 C 252.

should have been developed instead of a descriptive standard which excluded energetically modified cement.[215] As follows from the Guidelines on Horizontal Cooperation, when parties, without any objective justification, set a standard in such a way that products of their competitors which are based on other technological solutions cannot satisfy it, they are likely to give rise to restrictive effects.

Thus first of all, EMC could not prove that the process was unfair in the sense that they had not been able to adequately participate. Secondly, concerning the content of the standard, the Court did not go into the question of whether the standard itself unjustifiably put EMC at a disadvantage.

3.6.2.6 Overview of the five cases

The Guidelines on Horizontal Cooperation Agreements repeatedly state that it needs to be assessed on a case-by-case basis whether there is an infringement on competition law through standardization. These cases show that there is not one definite line that is followed by the ECJ and the Commission.

Three out of the five cases (IMS, Microsoft, Rambus) concerned the openness of the standard in the sense of access to the standard and under what terms. In IMS refusing to license was in the end permissible, while in Microsoft it was not. Additionally, in the Rambus case the Commission was very strict where it concerned Rambus deceptive conduct of not revealing standard-essential patents.

The other two cases concerned the possibility of effective participation in the process. In the X/Open group case the efficiency gains of excluding certain parties outweighed the negative effects for the parties that were not involved. In the EMC development failed to make the case stick that it could not participate fully and as the standard specifically excluded their products could not access the market or maintain their position on the market.

To note, these are all cases concerning competition. They do not address issues of societal interests such as those of the consumer interests or environmental protection. However, indirectly, competition law should improve the position of consumers, especially by supporting choice in products and services.

3.6.3 Intellectual property rights restrictions and the use of FRAND principles

One of the ways that parties can be restricted from gaining access to the result of the standardization process is when certain parties enjoy IPRs to components that are essential for the standard. This might result in an unfair gain of market

[215] Lundqvist, B. (2014) *Standardization under EU Competition Rules and US Antitrust Laws: The Rise and Limits of Self-Regulation*, Cheltenham: Edward Elgar Publishing, p. 204.

share. This way, use of IPRs can constitute an abuse of market power as described in art. 102 TFEU.

Ideally, standards implement a technology and diffuse it in the market. On the other hand, IPRs generally restrict diffusion of new technologies.[216] IPRs impair other parties from using patented technology by refusing licenses or demanding a high price for the use of the technology.

The Guidelines on Horizontal Cooperation discussed in the previous section, introduce the FRAND commitments in standardization as an EU policy. The Guidelines indicate that developing standards on FRAND terms is one aspect to determine that a standard will not restrict competition.[217] The formal ESOs all subject their process to FRAND rules. The policy is included in the internal guides we discussed above.[218] Parties are therefore bound to the FRAND rules by participating in the ESO process. This means that if a party in the process of the formal ESOs has a patent on a part of the standard, he can only execute his right by licensing the patented technology at fair, reasonable and non-discriminatory terms. Moreover, the annex of the New Regulation on European Standardisation we discussed earlier in this chapter introduces the use of FRAND terms as a requirement for recognition as a European standard, which is not developed by an ESO.[219]

The case when IPRs are not disclosed during the process is referred to as "patent ambush", as we observed in the previous Rambus case.[220] The company will, in that case, only reveal the patent after the standard has gained popular recognition, thus, locking in its competitors. This practice can constitute an abuse of their dominant position when those property rights are highly restrictive. Whether, it constitutes an infringement, however, needs to be evaluated on a case-by-case basis.[221]

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[216] Bekkers, R. et al. (2002) Intellectual property rights, strategic technology agreements and market structure; the case of GSM, Research Policy 31(7).

[217] Commission, Guidelines on the applicability of Article 101 of the Treaty on the Functioning of the European Union to horizontal co-operation agreements, OJ 2011 C11, §7.3.3.

[218] CEN/CENELEC Guide 8 § 5 and ETSI Rules of Procedure, 20 March 2013 retrieved 21 March 2014: http://portal.etsi.org/directives/32_directives_oct_2013r.pdf and ETSI Rules of Procedure, Version 32, October 2013, Annex 6 §6, retrieved 13 October 2014: http://portal.etsi.org/directives/32_directives_oct_2013r.pdf.

[219] Regulation No 1025/2012 on European standardization OJ 2012 L316, Annex II 4c.

[220] Staniszewski, P. (2007) The interplay between IP rights and competition law in the context of standardization, *Journal of Intellectual Property Law & Practice*, 2(10), p. 670.

[221] Guidelines on the applicability of Article 101 of the Treaty on the Functioning of the European Union to horizontal co-operation agreements, OJ 2011 C11, §7.3.1.

The FRAND policy is specifically directed at situations in which companies introduce standard essential patents (SEPs) technology in the standardization process, and address the way in which they subsequently license those SEPs. This policy entails that as long as access to the standard is based on FRAND terms, IPRs will normally not be assumed to restrict competition and is, therefore, deemed permissible. Consequently, incorporating patents in the standard is not a restriction of competition in and of itself.
An example of a violation of the FRAND criteria in a standardization process is when patent holders make cross-licensing agreements to the detriment of others that are not part of the agreement. For example, imposing higher royalties for parties not involved in the cross-licensing agreement or even excluding them from obtaining a license and from the use of the standard, will likely infringe on FRAND policy. [222]

Although referring to FRAND licensing is common even outside the formal standardization organizations, it remains unclear what the concept of FRAND precisely entails. The assessment of whether the standard complies with FRAND terms is left to be determined by the participants of the process itself. Furthermore, whether the SEP complies with FRAND terms is determined *ex-post*. Conclusively, establishing what FRAND terms of licensing should *be ex-ante*, is not feasible. [223] After all, during the standardization process, it cannot be determined what a fair and reasonable price of an IPR will be because the market at that time is merely a potential market.
One can deduct that "non-discriminatory" indicates that a license cannot be refused to anyone, if the party is willing to pay the required price. However, the terms "fair" and "reasonable" are considerably more ambiguous. [224] The Commission holds that FRAND terms induce the following obligations:

> "(i) to make the patent in question available to all interested third parties;
> (ii) not to discriminate between different licensees; and
> (iii) to offer a licence to the patent on fair and reasonable terms.
> SEP holders do, however, have the right to conduct negotiations with interested parties concerning the exact terms and conditions of the

[222] Sanders, A. (2010) Standards Setting in the ICT Industry? IP or Competition Law? A Comparative Perspective, *Os 10 anos de Investigação do CIJE – Estudos Jurídico-Económicos,* p.5.
[223] Mariniello, M. (2011) Fair, Reasonable and non-discriminatory (FRAND) terms: A Challenge for competition Authorities, *Journal of Competition Law & Economics*, 7(3), p 524.
[224] Lemley, M. (2002) Intellectual Property Rights and Standard-Setting Organizations, *California Law Review*, 90, p. 1964.

licence, including the exact level of royalties and the right to enforce such agreements by means of litigation".[225]

These negotiations do not allow the SEP holders to refuse licensing. This was the case in the EU Commission decision regarding Samsung in the enforcement of SEPs.[226] Samsung filed SEP-based injunctions against Apple in different Member States. By using the standard, Apple inherently used Samsung's technology that held a SEP. Samsung was part of the ETSI standardization for 3G wireless and mobile communication system and, therefore, had committed to license under FRAND rules. The Commission decided that because Apple was not unwilling to enter into a license agreement under FRAND terms, there was no objective justification to seek injunction and Samsung, thus, infringed on art. 102 TFEU.[227]
Nevertheless, the question as to what "fair and reasonable" means remains unanswered. This question seems difficult to answer for competition authorities as well. Neither case law nor commonly recognized economic theories provide any conclusive insights on what the concept entails.[228]
Apart from the notion that the exact meaning of FRAND terms remains vague, it should also be remembered that although an individual licensing price may be reasonable, when accumulating all of the fees of the SEPs for a standard, the costs can be considerably high.[229]

3.7 Smart grid standardization mandate

In subsection 3.5.1.1 we discussed the changed status of the standardization mandate. In previous interpretations of the standardization mandate considered the mandate only to be binding in contract concerning the practical issues, such as deadlines of the work and financing.[230] As a decision, the mandate is binding in its entirety to the ESOs. Moreover, a decision needs to be viewed in light of

[225] Commission Decision declaring a concentration to be compatible with the common market, C (2012)1068.
[226] European Commission decision relating to a proceeding under Article 102 of the Treaty on the functioning of the European Union and Article 54 of the EEA, OJ C 350.
[227] Commission decision relating to a proceeding under Article 102 of the Treaty on the functioning of the European Union and Article 54 of the EEA, OJ C 350, § 4.4.
[228] Mariniello, M. (2011) Fair, Reasonable and non-discriminatory (FRAND) terms: A Challenge for competition Authorities, *Journal of Competition Law & Economics*, 7(3), p 525.
[229] Blind, K. (2009) *Standardisation as a Catalyst for Innovation*, Inaugural Lecture for the Erasmus University Rotterdam, p.22.
[230] Hofmann, H., et al. (2011) *Administrative Law and Policy of the European Union,* Oxford: University Press, p. 596 or Schepel, H. (2005) *The constitution of private governance: product standards in the regulation of integrating markets,* Portland: Hart Publishing, p. 230-231.

concerning higher legislation, while a contract is only binding in what is laid down in the contract.[231]

The smart grid standardization mandate (M/490) was issued in March 2011.[232] With this, the European Commission requested the European ESOs to develop smart grid technical and ICT standards to achieve interoperability between various components and to facilitate smart grid services.[233] The smart grid standardization mandate is based on the findings from the expert groups of the Commission Smart Grid Task Force. Specifically, Expert Group 1 is relevant because it focuses on the functionalities of smart grids and smart meters and on smart grid standardization.[234] The mandate was requested before the introduction of the New Regulation on standardization. It requested the first set of standards in 2012. It additionally provides for iterations of the process if necessary. The Commission agreed on an iteration of the mandate for 2013-2014, and according to the work program for 2015 the work will be continued. This iteration phase does fall under the New Regulation.

We review several issues the smart grid standardization mandate describes.

To start, the aim of the mandate is expressed in the following sentence:

> "The objective of this mandate is to develop or update a set of consistent standards within a common European framework that integrating a variety of digital computing and communication technologies and electrical architectures, and associated processes and services, that will achieve interoperability and will enable or facilitate the implementation in Europe of the different high level Smart Grid services and functionalities as defined by the Smart Grid Task Force that will be flexible enough to accommodate future developments."[235,236]

Furthermore, mandate describes that the work will contain the following three deliverables:

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[231] The ECJ has held that a decision "necessarily involves an appreciation of that situation in the light of Community law" Case C-163/99 Portuguese Republic v Commission, ECLI:EU:C:2001:189.

[232] Standardization Mandate to European Standardisation Organisations (ESOs) to support European Smart Grid deployment, Brussels 1st March 2011 M/490. retrieved from http://ec.europa.eu/energy/gas_electricity/smartgrids/doc/2011_03_01_mandate_m490_en.pdf.

[233] Standardization Mandate to European Standardisation Organisations (ESOs) to support European Smart Grid deployment, Brussels 1st March 2011, M/490.

[234] EU Commission Task Force for Smart Grids, Expert Group 1: Functionalities of smart grids and smart meters, Final Deliverable, December 2010, retrieved 18 December 2014: http://ec.europa.eu/energy/gas_electricity/smartgrids/doc/expert_group1.pdf.

[235] Standardization Mandate to European Standardisation Organisations (ESOs) to support European Smart Grid deployment, Brussels 1st March 2011 M/490, p. 2.

[236] This is not the only sentence in the mandate that takes up a whole paragraph and becomes grammatically incorrect.

1. "A technical reference architecture, which will represent the functional information data flows between the main domains and integrate many systems and subsystems architectures.
2. A set of consistent standards, which will support the information exchange (communication protocols and data models) and the integration of all users into the electric system operation.
3. Sustainable standardization processes and collaborative tools to enable stakeholder interactions, to improve the two above and adapt them to new requirements based on gap analysis, while ensuring the fit to high level system constraints such as interoperability, security, and privacy, etc."[237]

Words as "many systems", "all users", "such as", do not provide clarity about the requirements that actually have to be met. The annex brings forth more concrete examples of the technical domains, yet it is neither limitative nor binding for the ESOs. These are for example data modeling, description language, cyber security, data protection, and Information system management.
At the same time, European smart grid standardization has a head start compared to the Dutch smart meter case, when it comes to privacy protection. The mandate repeatedly addresses the necessity to incorporate privacy protection for the customer. It is mentioned in the sections on the mandated work itself as well as in the section on the scope and in the section on the execution of the mandate. The reason that this aspect is addressed this well, might be the interests of technical experts in privacy issues. Integrating privacy protection in technology is one of the few legal issues that are repeatedly discussed in technical sciences as well.[238] There is also a great amount of public concern about privacy issues in relation to smart meters and smart grids as we saw in Chapter 2.

The mandate finally encompasses a description of the background of the mandate. This part does not provide any requirements for the standards but describes aims for implementing smart grids in general. In this part, the 20/20/20 targets are key. However, the mandate does not set any requirements for the standard based on those aims.

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[237] Standardization Mandate to European Standardisation Organisations (ESOs) to support European Smart Grid deployment, Brussels 1st March 2011 M/490, p. 5.
[238] Sweeney, L. (2002) K-anonymity: A model for protecting privacy, *International Journal of Uncertainty, Fuzziness and Knowledge-Based Systems*, 10(05), or Cavoukian, et al. (2010) Privacy by Design: essential for organizational accountability and strong business practices, *Identity in the Information Society*, 3(2).

3.8 The Eco-design Directive

The Eco-design directive of 2009 provides an important tool to enforce consideration of environmental impact in standardization.[239] The directive aims to encourage avoiding pollution caused by sources with negative environmental impact. The underlying idea is that by improving the design the environmental polluting impacts of "energy using products" will be reduced. It is a New Approach directive regarding energy-related products, instructing that during the design phase of products, an evaluation of environmental aspects is taken into account. It, therefor, is applicable to standardization within the ESOs. According to estimations, 80% of product-related environmental impacts are determined during the planning phase and, therefore, the standardization process is an important stage to consider these impacts.[240]

For the Eco-design Directive to apply to standards, the Commission has to draft an implementing measure indicating the specific product it concerns. Article 15 of the Directive sets out the criteria of when a product shall be covered by an implementing measure. The criteria include the following: the volume of sales should indicatively be more than 200.000 yearly, the product should have a significant environmental impact, and the product shall present a significant potential for improvement of the environmental impact.

The applicability of the Eco-design Directive for smart grid standardization would help to safeguard environmental protection in the standard. The smart grid standardization mandate, however, does not refer to this directive, and no relevant implementing measure exists. Interestingly, the Network Codes we will address in the following section do refer to the Eco-Design Directive with respect to demand side response, which is part of smart grids.[241] Moreover the Eco-design working plan of 2012-2014 does mention smart meters as a relevant group of appliances for Eco-design.[242]

3.9 The European Network Codes

[239] Eco-design directive 2009/125/EC, OJ 2009 L 285.
[240] Standardization mandate for work in the field of eco-design of energy using products, M/341, Brussels 7 January 2004.
[241] E.g. Draft ENTSO-E Network Code on Demand Connection, 21 December 2012, art. 21, retrieved on 23 Dec 2014: http://networkcodes.entsoe.eu/connection-codes/demand-connection-code/
[242] Commission staff working document: Establishment of the Working Plan 2012-2014 under the Ecodesign Directive , SWD(2012) 434, p. 5.

3.9.1 What are the Network Codes?

Because there are similarities between standards and the Network Codes in the European energy market, we will briefly discuss the Network Codes and how they relate to standardization. These codes are similar to standards because they describe important technical requirements in the field of energy. Network codes are developed on the basis of Regulation 714/2009.[243] The codes are sets of cross-border rules that apply to the energy sector in support of the European Internal Energy Market.

Although standardization operates quite separately from the Network Codes for electricity, the Network Codes play a crucial role in the technical arrangement of the cross-border exchange of electricity. The Agency for the Cooperation of Energy Regulators (ACER), the European Network of Transmission System Operators for Electricity ENTSO-E, and market participants develop the Network Codes. After the comitology process, these codes, contrary to standards, become legally binding.[244] The Commission sets annual priority lists based on which ACER establishes framework guidelines that, in their turn, form the basis for the development of the Network Codes by ENTSO-E.[245] In this preparatory phase, the ESOs are invited to provide their views on the priorities.

The European Network Codes only address cross-border issues and will not interfere with the national Network Codes regarding distribution systems.[246]

3.9.2 Possible incongruity between the codes and standards

The coordination between technical standardization and the development of Network Codes is relatively weak. When considering the similar and sometimes overlapping topics it is, however, important that both the processes of standardization in the working groups and the process of developing Network Codes take each other's progress into account. According to the Secretary-General of ENTSO-E, Konstantin Stachus "*[c]oordination between the network codes and standardization activities is key to ensure that both tools reach their objectives*".[247]

Moreover, in its *Communication on Smart Grids: From innovation to deployment* the Commission implied that the Network Codes are actually similar to standards.[248] It stated that when the progress of smart grid standardization is not sufficient, it

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[243] Regulation No 714/2009 on conditions for access to the network for cross-border exchanges in electricity, OJ 2009 L 211.

[244] Based on article 46 of the third electricity directive, 2009/72/EC, OJ 2009 L211 jo. Art 23 Regulation No 714/2009, OJ 2009 L 211.

[245] Artt. 6 and 8 of Regulation No 714/2009, OJ 2009 L 211.

[246] recital 7 of Regulation No. 714/2009, OJ 2009 L 211.

[247] Interview with ENTSO-E Secretary General Konstantin Staschus, retrieved on 31 March 2014 from: http://setis.ec.europa.eu/setis-magazine/smart-grids/interview-entso-e-secretary-general-konstantin-staschus.

[248] Commission Communication: Smart Grids: from innovation to deployment, COM (2011)202

would ensure necessary standards "for example by defining a network code".[249] This implies that standards and Network Codes can be developed interchangeably. Be that as it may, if standards address the same technical domains as Network Codes, this could lead to undesirable conflicts between the two. If the provisions of the Network Codes cover part of a standard, and the Network Codes have different requirements, the Network Codes need to be adhered to, resulting in non-compliance with the standard. While on the other hand, if both processes are aligned, standards could complement the Network Codes in the sense that they specify details left open by the Network Codes.
We can see that the conflict between the codes and standards is a potential problem for smart grid standardization. First of all, the smart grid standardization mandate does not mention the Network Codes at any point. Second, the ESOs' first set of standards deliverable refers to some ENTSO-E standards but not to adapting to Network Codes or vice versa.[250] Although formally there are no indications that any type of coordination exists, communication between ENTSO-E and CENELEC suggests that they do coordinate certain aspects relevant for the smart grid standardization mandate. [251] Additionally, CEN/CENELEC and ENTSO-E signed a Memorandum of Understanding in September 2013.[252] This memorandum allows both parties to select experts to join the others processes and, specifically, represent each other in the process of smart grid standards. Nonetheless, no formal framework is in place to ensure consistency between the codes and standards.

3.10 Conclusion

The aim of this chapter was to review the legal framework for smart grid standardization. It answers subquestion SQ1. To this end, we first described the legal framework for standardization in general. The framework for New Approach standards is quite straightforward. For these standards a particular framework is in place in which each standard needs to comply with a specific New Approach directive and relevant implementing measures.

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[249] Ibid., p. 6.
[250] November 2012, CEN-CENELEC-ETSI Smart Grid Coordination Group: First Set of Standards, retrieved 23 December 2014:
http://ec.europa.eu/energy/gas_electricity/smartgrids/doc/xpert_group1_first_set_of_standards.pdf.
[251] Meeting Minutes Drafting team on the Demand Connection Network Code and CENELEC regarding Mandate 490, retrieved 29 November 2014:
https://www.entsoe.eu/fileadmin/user_upload/_library/consultations/Network_Code_DCC/111205_DCC_-_CENELEC_MoM.pdf
[252] The existence of the Memorandum is confirmed in communication with CEN/CENELEC by the author but the Memorandum itself is not publically available.

The New Regulation on European Standardisation introduces some novel provisions in the standardization framework. The New Regulation, first of all, encourages the participation of societal stakeholders in the process and formalizes their financing by the EU. It moreover requests that national standardization bodies improve the position of SMEs in the process. Nevertheless, because of the system of national representation in CEN/CENELEC it does not impart voting rights on the societal stakeholders or SMEs.

Next to the societal stakeholders, parties that are not involved in the process, have an opportunity to comment on the standard through their NSB. The New Regulation does, nonetheless, not regulate this possibility. This part is only codified in the ESO guides.

Most importantly, there are new provisions regarding the status of the standardization mandate in the New Regulation. The Regulation implies that the mandate itself is actually a Commission Decision, and thus has a different status than the formerly assumed status of a contract. The smart grid standardization mandate is the only source for requirements to which the standards need to adhere. In verifying the compliance with the mandate status of the mandate is, important in this research.

As to policy aims and requirements for standardization specifically, the New Regulation acknowledges the significance of standardization in achieving EU policy aims. It moreover suggests that the Commission verifies that the requirements of these aims are safeguarded in the standard before publishing it in the Official Journal of the EU. Nonetheless, guidance documentation explains that the New Regulation does not provide for a procedure in which the Commission would approve or verify standards. Additionally, the New Regulation lays down a procedure for the Member States and Parliament to make formal objections to the standard. There have been five objections, but the Commission has not made any decisions about them yet.

Next to standard-specific regulation, competition law provides a legal framework for standardization as well. This framework aims to ensure that standardization agreements do not exclude parties from competing in the market. It sets procedural and substantial requirements. The procedural requirements should, for example, safeguard the unjustifiable exclusion of stakeholders in the process. Substantial requirements as the FRAND policy see to the standard itself and determine under which terms SEPs can be sold.

The cases before the Commission showed that a lack of participation in the process and the openness of the standard itself can give rise to competition questions.

Moreover, we discussed the framework that is relevant for smart grid standardization specifically. First, the smart grid standardization mandate only sets minimal requirements for the standard concerning for example deadlines. The aims for smart grids are mentioned as a background, but there are no requirements for standards related to these aims. Second, there is a possible overlap of Network Codes and standards. The Network Codes can address the same subjects as standardization, yet have a distinctly different development process because they are set in the comitology procedure. The mutual alignment is only informally established, creating the chance that standards conflict with Network Codes. Third, the Eco-design Directive provides a framework for energy-consuming products. It sets requirements for the environmental impact of these technologies. However, because there is no implementing measure determining the applicability of the Directive for smart grid standardization, this framework does not lay down requirements for smart grids.

To conclude, there is a framework in place concerning the standardization of smart girds. This framework is quite effective in safeguarding EU competition law. As to safeguarding other policy aims and requirements for smart grids such as environmental protection and consumer protection, this framework only provides minimal safeguards. The New Regulation stimulates the involvement of societal stakeholders, yet does not improve their position in the voting stage. Finally, the New Regulation suggests that the Commission verifies that standards are in line with policy requirements, but because the standards are too technical for the Commission to comprehend fully, this verification is only marginal.

4 EU policy aims and requirements for smart grids

This chapter addresses subquestion SQ2: What are the EU policy aims and requirements for smart grids? It sets out the relevant EU policy aims and requirements for smart grids laid down in relevant EU law and specific smart grids soft law documents. The aims for smart grids are related to carbon emission reduction and the functioning of the market. We will see that there are different requirements, such as data protection to ensuring security of supply.

4.1 Introduction

This chapter addresses the second subquestion SQ2 of this research: What are the policy aims and requirements for smart grids? It is based on an analysis of the EU energy legislation and smart grid policy as laid down in Commission Communications and Staff Working Documents. The EU smart grid policy mainly stems from its energy policy but is also part of the information society policy. This chapter commences with a background on the electricity market describing the liberalization of the market and is followed by a description of the three overarching aims and requirements for smart grids that originate from the TFEU. These overarching aims and requirements are supporting market liberalization; reducing carbon emissions; and ensuring security of supply. This chapter subsequently addresses the pertinent energy directives, decisions and regulations and continues with the relevant provisions for the smart grid user from the Charter of Fundamental Rights of the European Union (the Charter) and other EU privacy and data protection regulations. Subsequently smart grid soft law is studied, and its aims and requirements are assessed.

4.2 Smart grid relevant EU law

In the introduction of this research, we observed that smart grids are assumed to have different purposes. In this section, we examine the overall aims for smart grids that originate from the EU legal and policy framework and the requirements that the framework generates for the development of smart grids.

In this section, we start by discussing the fundamental energy market aims of the TFEU and continue with specific energy directives and regulations. The majority of these documents do not pertain to smart grids directly, yet they do pertain to the four aims of supporting market liberalization; reducing carbon emissions; ensuring security of supply and the interconnection of networks and are thus indirectly essential in the development of smart grids. The energy directives are binding for Member States and entail the

principles of EU energy law in general. We then specifically study Commission decisions concerning smart grids. Policy that addresses smart grids in particular is predominantly (still only) addressed in soft law documents. We will therefore start by presenting an overview of the provisions that are relevant for the energy market in general and that affect the introduction of smart grids. Moreover, the EU privacy regulation addresses specific requirements for the smart grid end user. We will address the basic legal framework to this extent and observe the requirements that this framework sets.[253]

It is tempting to write an elaborate overview of European regulation in relation to smart grids. Smart grids produce a multitude of legal questions for which EU regulation has not yet provided clear answers. There exists ample high quality research to this respect.[254] Not all of these issues are, however, imperative to this research concerning smart grid standardization. We will therefore limit ourselves to a description of fundamental energy law that is relevant to smart grids. We will not enter into extensive discussions on how the legislation is developed. Instead, we will explain the aims and requirements for smart grids that arise from the EU legal framework, including soft law.

4.2.1 Background of the free electricity market

At the background of the current regulation of the energy market is the electricity market liberalization that was agreed upon in 1996.[255] Without liberalization, the discussion regarding smart grids, let alone standardization, would be quite different. Liberalization can be a driver for innovation.[256] Liberalization is, actually, an important enabler for smart grids. As for standards, these are considerably more important in a liberalized market to allow exchangeability of systems and devices.[257] In a state-owned electricity system, it is easier for governments to determine standards as opposed to the current case in which different companies are players in the electricity markets and need to coordinate standards. Hence, we will discuss this issue briefly yet because it is not the topic of this chapter, we will refrain from dealing with the topic extensively.

Prior to liberalization, electricity companies were vertically integrated in most Member States. This meant that in general suppliers and DSOs were incorporated in one undertaking. Additionally, these integrated operations were state-owned. The

[253] Security is a requirement for smart grids specifically as well. However, as these requirements are still only set in soft law, we discuss this in section 4.4.

[254] E.g. Meeus, L., et al (2010) *Smart Regulation for Smart Grids*, EUI Working papers RCSAS no. 2010/45, Swora, M. (2010) Intelligent Grid: Unfinished Regulation in the Third EU Energy Package. *J. Energy & Nat. Resources L.*, 28, or Pront-van Bommel, S. (2011), Smart energy grids within the framework of the Third Energy Package, *European Energy and Environmental Law Review*, 20(2).

[255] Directive 96/92/EC Concerning Common Rules for the Internal Market in Electricity, OJ 1997 L 27.

[256] E.g. Markard, J., & Truffer, B. (2006) Innovation processes in large technical systems: Market liberalization as a driver for radical change?, *Research Policy*, 35(5), or Markard, J., et al. (2004). The impacts of market liberalization on innovation processes in the electricity sector, *Energy & Environment*, 15(2).

[257] Specht, M. (2013) Smart Metering in European Context, in: Ulsar et al. (eds.) *Standardization in Smart Grids*, Heidelberg: Springer, p. 187.

internalization of the electricity market of the EU included phased market liberalization through directives grouped into the three "energy packages", with each package following up on one another. Each package, therefore, introduced a new phase in liberalization. Finally, the liberalization resulted in the prohibition of vertically integrated energy companies. This meant that the supplier, producer, and transmission and distribution system operators were unbundled. The level of unbundling was different amongst Member States. Some, for example introduced a privatizations of the supply system. This allowed for new entrants on the supply and production market. The DSOs are designated by the Member State. Furthermore, to increase competition in the energy market, the consumers obtained the opportunity to choose their supplier and also the ability to switch suppliers at any given moment.

The first package consisted of Directives 96/92/EC (electricity) and 98/30/EC (gas). This package contained the first steps of the unbundling of electricity generation (production), transmission and distribution activities. The second package contained Directives 2003/54/EC, 2003/55/EC, Regulation no. 1228/2003 and Regulation no. 1775/2005. This phase allowed Member States to impose public service obligations on undertakings operating in the electricity sector in relation to, for example, security and quality of supply. It also demanded third-party access to the transmission and distribution system. In addition, deadlines were set for opening the national markets to large consumers (2004) and small consumers (2007). This phase also introduced the obligation of Member States to designate a national regulatory authority (NRA). The implementation of the third package of Directives 2009/72/EC and 2009/73/EC, Regulations nos. 713/2009, 714/2009 and 715/2009 was the last phase. It demanded full ownership unbundling of supply and distribution[258], elaborated on the duties of the NRAs and established the Agency for the Cooperation of Energy Regulators (ACER). It also introduced a series of provisions for the protection of the (vulnerable) customer. Because it is the most recent package, we will specifically discuss the third package in more detail in the next section in relation to smart grids.
Taking the process step by step allowed for gradual changes in the European market. For each directive, Member States needed to comply with the implementation deadline. Thus, at least in theory, Member States would complete a previous stage before addressing the next stage. To note, the liberalization of the EU electricity market did not entail that each Member State took exactly the same steps in the same order. This was partly due to different starting points. Moreover, the directives allowed for minimum harmonization: thus, some Member States took further steps than others.

[258] However art. 26 of Directive 2009/72/EC contains exemption possibilities in the cases that DSOs fall below a 100,000 customer threshold.

Of course, there is considerably more to discuss regarding the history of liberalization; however, this falls outside the scope of this chapter, and we only present a basic description.

4.2.2 The legal framework of EU energy law

In this section we describe relevant EU law that is important for the development of smart grids. This part contains a description of the relevance of the TFEU for smart grids. It also elaborates on relevant energy directives, Commission decisions and regulations.

4.2.2.1 Energy in the Treaty on the Functioning of the European Union

The TFEU defines the scope of the EU energy policy and the division of competences between the EU and the Member States.
Article 194 of the TFEU starts with noting that "[i]n the context of the establishment and functioning of the internal market and with regard for the need to preserve and improve the environment, Union policy on energy shall aim in a spirit of solidarity between Member States to:

(a) ensure the functioning of the energy market;
(b) ensure security of energy supply in the Union;
(c) promote energy efficiency and energy saving and the development of new and renewable forms of energy; and
(d) promote the interconnection of energy networks."

These are the fundamental aims for the EU energy market. Therefore, it is pivotal that smart grid standards make the achievement of these aims possible.

4.2.2.2 The Third Electricity Directive[259]

The Third Electricity Directive is part of the latest energy package and predominantly encompasses basic legislation concerning the current EU energy market.

The consumer

As discussed in the introduction of this research, the consumer plays as important role in the development of smart grids. The Third Electricity Directive is an important step in securing the position of the consumer in the EU electricity market.

[259] Directive 2009/72/EC concerning common rules for the internal market in electricity, OJ 2009 L 211.

The Commission Communication on the European Energy policy already stressed the importance of the rights of the consumer in 2007.[260] It was a prelude to the Third Electricity Directive in which consumer protection is expressed in several provisions.[261] The Directive addresses a more active participation of consumers through energy efficiency, and with that, their role in realizing carbon emission reduction aims.[262]
One of the most important parts of this directive is the provision pertaining to universal service. This is pronounced in the Third Electricity Directive in article 3 §3 which states that household customers should be "supplied with electricity of a specified quality within their territory at reasonable, easily and clearly comparable and transparent prices." This is in line with the aim of ensuring the functioning of the market and the requirement of security of supply presented in the TFEU aims for energy.

The vulnerable customer

Providing special protection for the "vulnerable customer" by Member States is a crucial requirement of the Third Electricity Directive.[263] Member States define the concept of vulnerable customer. The protection of the vulnerable customer is not only present in energy policy, but part of a EU wide consumer protection framework. This comprises of explicit protection in relation to, for example unfair commercial practices or consumers rights, but are also implicitly part of credit agreement legislation.[264]
Member states have different approaches to the protection of vulnerable customers.[265] The EU 'Vulnerable Consumer Working Group Guidance Document' provides information on protecting the vulnerable customer for all actors involved[266]. This for example pertains to banning practices of disconnecting customers in cold periods, in which case the customers would be unable to warm their houses, or to designating a supplier of last resort.
Moreover, a vulnerable customer is often only deemed as one with financial problems. However, other aspects can also constitute vulnerability. For example, blind or illiterate people might have problems with obtaining information on their energy bills, because the

[260] Commission Communication: An Energy Policy for Europe, COM(2007)1.
[261] De Moor- van Vugt, A. (2011) Handhaving en toezicht in een Europese context, in: S. Pront- van Bommel (eds.) *De consument en de andere kant van de elektriciteitsmarkt*, Amsterdam: UvA Centrum voor Energievraagstukken, 2011, p. 64.
[262] Lavrijssen, S. (2012) Inaugural lecture for the University of Amsterdam, *De verschillende gezichten van de energieconsument: naar een gedragseconomische benadering van de regulering van de energiesector*, p. 5.
[263] Art. 3 § 7 Directive 2009/72/EC.
[264] Waddington, L. (2013) *Reflections on the Protection of 'Vulnerable' Consumers under EU Law*, Maastricht Working Papers, 2013-2, p. 4-10.
[265] E.g. ERGEG (2009), *Status review of the definitions of vulnerable customer, default supplier and supplier of last resort*, E09-CEM-26-04, Brussels, and CEER (2012) *Status Review of Customer and Retail Market Provisions from the 3rd package as of 1 January 2012*, Brussels, p.24-30.
[266] Vulnerable Consumer Working Group Guidance Document on vulnerable customers, November 2013 retrieved on 25 November 2014:
http://ec.europa.eu/energy/gas_electricity/doc/forum_citizen_energy/20140106_vulnerable_consumer_report.pdf

system is organized for people who can read.[267] Ensuring provisions for consumers who cannot afford energy in normal market circumstances is one of two ways to achieve the aim of reasonable energy prices as part of security of supply, the other way is promoting efficient competition.[268] Annex 1 of the Third Electricity Directive elaborates on the rights of the consumers and the requirements for the service providers, including requirements regarding billing methods and transparent prices.

Security of supply

Monitoring security of supply is also affirmed in this directive.

> "Such monitoring shall, in particular, cover the balance of supply and demand on the national market, the level of expected future demand and envisaged additional capacity being planned or under construction, and the quality and level of maintenance of the networks, as well as measures to cover peak demand and to deal with shortfalls of one or more suppliers."[269]

As we saw in the introduction of this research, smart grids are regarded as an enabler of security of supply whilst integrating renewables. This is one of the most important requirements that they must cover.

The Third Electricity Directive also briefly refers to smart grids specifically. First of all the preamble in consideration 27 mentions smart grids as a means to modernize the network in order to encourage decentralized generation and energy efficiency. Moreover, article 3 §11 states that smart grids are one of the options to promote energy efficiency.

Standardization in the Third Electricity Directive

Additionally, it should be noted that article 5 of the Third Electricity Directive encompasses a specific provision for technical rules in the electricity market. This relates to standards set by Member States to ensure amongst others safety and interoperability, and can also pertain to smart grids. The notification of these standards will be in accordance with the notification procedure discussed in Chapter 3. Moreover, in this case the Agency for the Cooperation of Energy Regulators is allowed to make appropriate recommendations. However, because it is addressed to Member States standardization, it does not affect the EU smart grid standardization by the ESOs. Once the European standard is accepted and published in the Official Journal of the EU,

[267] George, M., et al. (2011) *Too many hurdles: information and advice barriers in the energy market*. Leicester: Centre for Consumers and Essential Services, p. 14-15, retrieved 30 December 2014: https://www2.le.ac.uk/departments/law/research/cces/documents/Too-Many-Hurdles-2011.pdf

[268] Bartl, M. (2010) The Affordability of Energy: How Much Protection for the Vulnerable Consumers?, *Journal of Consumer Policy*, 33 p. 227.

[269] Artt. 4 and 5 Directive 2009/72/EC.

Member States will need to adopt the standard as a national standard, regardless this provision.

4.2.2.3 Other relevant directives, decisions and regulations

Apart from the Third Electricity Directive and in line with the aim of promoting energy efficiency and energy saving and the development of new and renewable forms of energy, other legislation also address the development of smart grids.

The Energy Efficiency Directive provides a framework to achieve the targeted 20% energy efficiency by 2020 compared to projections of the estimated energy use when maintaining business as usual in 2020.[270] The directive explicitly refers to smart grids as a means to achieve energy efficiency improvements in article 15.

The Renewable Energy Sources Directive establishes a common framework for the promotion of energy from renewable sources.[271] The framework includes mandatory national targets for the share of energy from renewable sources in overall production. Article 16 of this directive states that the development of smart grids is an option to meet the requirement of ensuring secure operations while incorporating more energy from renewable sources and of accommodating the interconnection between Member States and third countries. The Annex of the accompanying Commission Decision on National Renewable Energy Action Plans notes that smart grids are one of the measures to minimize the curtailment of electricity from renewable sources.[272] This again relates to the requirement of security of supply of electricity. As mentioned in the introduction of this research, relying more on intermittent renewable energy sources should not be at the cost of security of supply. Smart grids should help to maintain a secure supply while integrating these sources in the network.

More recently, two regulations elaborate on the purpose of smart grids. The regulation "Connecting Europe Facility" describes smart grids as a means for sustainable development in article 4 §3: "contributing to sustainable development and protection of the environment, inter alia by the integration of energy from renewable sources into the transmission network, and by the development of smart energy networks and carbon dioxide networks."[273]

Furthermore, the preamble of the regulation on the Guidelines for Trans-European Energy Infrastructure states that "integrated networks and deployment of smart grids are vital for ensuring a competitive and properly functioning integrated market, for achieving an optimal utilisation of energy infrastructure, for increased energy efficiency and

[270] Directive 2012/27/EU, OJ 2012 L 315, of which the assessment requirement is laid down in Decision No 406/2009/EC, OJ 2009 L 140.
[271] Directive 2009/28/EC, OJ 2009 L 140.
[272] §4.2.7 Commission Decision of 30 June 2009 establishing a template for National Renewable Energy Action Plans 2009/548/EC, OJ 2009 L 182,
[273] Regulation No 1316/2013 establishing the Connecting Europe Facility, OJ 2013 L 348.

integration of distributed renewable energy sources and for promoting growth, employment and sustainable development."[274] Next to the aims of carbon emission reductions to which the other documents of this paragraph referred, this regulation also notes the importance of a competitive and functioning integrated market.

4.2.3 Fundamental provisions for the smart grid consumer

The previous sections showed that the user has a central role in the energy market. The protection of consumers is especially important in the Third Electricity Directive, and it is considered to play a crucial role in smart grids. As observed in the smart meter case, privacy and data protection deserve additional attention in the EU energy market framework with regard to smart grid developments. The introduction of smart grids includes a serious increase in information on use and production of energy. This information, to the extent that it is personal information, needs to be protected against unlawful infringements. Privacy and data protection is elaborately addressed in EU legislation. Here we present an overview of the current basic EU law concerning privacy. What exactly the consequences of the transition to smart grids for privacy protection are is an issue that needs to be researched. However, in this part we will only briefly address them in order to set out an overview of the aspects of privacy protection as part of consumer protection.

4.2.3.1 The European Convention on Human Rights ECHR, the Charter and the TFEU

The protection of privacy for individuals was already agreed upon amongst European countries in the 1950's in the ECHR.[275] Art. 8 of the ECHR expresses the right to respect private life and forbids governments to interfere, unless it is in accordance with the law and necessary in a democratic society. National governments and legislators enjoy a margin of appreciation as to whether an interference is necessary.[276]

The Charter is meant to make fundamental civil, political, economic, and social rights of the EU citizen and residents more visible.[277] Article 51 (1) clarifies that the Charter is addressed to the institutions and bodies of the Union including offices and agencies.[278]

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[274] Recital 8, Regulation No 347/2013 on guidelines for trans-European energy infrastructure, OJ 2013 L115.
[275] Murray, P. (1997) Adequacy Standard under Directive 95/46/EC: Does US Data Protection Meet This Standard, *The. Fordham Int'l LJ*, 21, p. 943.
[276] This margin of appreciation was first established in ECtHR of 7 December 1976 Handyside v. The United Kingdom, app. no. 5493/72 in relation to freedom of expression, specifically in relation to art. 8 the ECHR decided that in balancing economic interests the state enjoys a margin of appreciation in ECtHR of 8 July 2003 Hatton a/o v. The United Kingdom, app. no. 36022/97.
[277] Anderson, D. & Murphy, C. (2012) The Charter of Fundamental Rights, in: Bioni, A et al. (eds.) *EU Law after Lisbon*, Oxford: University Press, p.156.
[278] Ibid. p. 8.

Since the introduction of the Lisbon Treaty, article 6 of the TFEU recognizes that the Charter has the same legal value as the Treaties and that it is legally binding.
Article 7 of the Charter describes the traditional understanding of the right to privacy by stating that "[e]veryone has the right to respect for his or her private and family life, home and communications." Article 8 of the Charter reflects the individuals' fundamental right of the protection of their personal data in the Charter of the EU.[279] Article 8 starts with declaring that everyone has the right to the protection of his or her personal data. It continues that data can only be accessed with consent or on a legitimate legal basis. Finally, the article mentions that everyone has the right of access to data, which is collected concerning him or her. Article 8 of the Charter should protect individuals from arbitrary interference by public bodies.[280]
Moreover, article 16 §2 of the TFEU requires the Parliament and the Council to lay down rules for data protection. It, therefore, forms the central provision of data protection regulation in the EU.[281]

4.2.3.2 Legislation concerning privacy and data protection

The increase in processing of personal data since the 1970s led to calls for protection of personal data, which in the EU was addressed with the Data Protection Directive[282,283] This directive, now under reform, served both the purpose of ensuring free flow of data amongst Member States, and, at the same time, of safeguarding the protection of personal data.[284] It applies to personal data in the sense that it concerns information relating to an identifiable person (art. 2a). Controllers processing personal data need to comply with the directive (art. 2b-d). This covers a wide reach of entities, including, for example, search engines.[285] The Directive requests Member States to, amongst others, provide that personal data are only collected for legitimate purposes and are stored no longer than necessary (art. 6). It also notes that, unless there is a legitimate cause, the person needs to unambiguously consent to processing the data (art.7). The Directive also explains what information needs to be provided to a person whose data are collected.

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[279] Rotenberg, M., & Jacobs, D. (2013) Updating the Law of Information Privacy: The New Framework of the European Union, *Harvard Journal of Law & Public Policy*, 36(2), p. 608.
[280] Poullet, Y. (2006) EU data protection policy. The Directive 95/46/EC: Ten years after, *Computer Law & Security Review*, *22*(3), p. 215.
[281] Hijmans, H. (2010) Recent developments in data protection at European Union level, *ERA Forum*, 11(2), p. 220.
[282] Directive 95/46/EC on the protection of individuals with regard to the processing of personal data and on the free movement of such data, OJ 1995 L281.
[283] Kirsch, M. S. (2011) Do-Not-Track: Revising the EU's Data Protection Framework to Require Meaningful Consent for Behavioral Advertising, *Rich. JL & Tech.*, 18(1), p. 3
[284] Wong, R. (2011) Data protection: The future of privacy, *Computer law & security review*, 27(1), p.54.
[285] Case C-131/12, Google v AEPD, ECLI:EU:C:2014:317.

At the start of this century, Regulation 45/2001 was introduced. It applies to the processing of personal data by all community institutions and bodies (art.3).[286] This Regulation also introduces the European Data Protection Supervisor, which has the tasks of supervision, consultation and cooperation.[287]
Subsequently, the Directive on Privacy and Electronic Communications[288] expanded the reach of data protection beyond personal data. It considers that in modern networks, the person to whom the data belong might not be known, yet privacy safeguards can be applicable.[289] This can, for example, be the case when data are transferred to a party that does not have access to the customer's details.
To conclude, there is a framework in place for EU privacy and data protection, which originated in the 1950s and is elaborated on in detail, especially in the last decades. Important requirements are that controlling data needs to be preceded by consent, or for legitimate purposes.

4.3 Smart grid policy aims in soft law

This part addresses the aims for smart grids specifically as opposed to the more general framework of §4.2. Because we need to understand the aims the sets EU sets exactly for smart grids, next to general aims for the electricity market, we need to analyze relevant soft law pertaining to smart grids. The Communications of the Commission, Commission Recommendations, and Commission staff working documents concerning smart grids specifically provide a view on the policy aims and requirements of the Commission on smart grids, even though they are not directly binding for Member States or other institutions. We study the aims of smart grids in relation to the Commission standardization mandate we discussed in chapter two and, therefore, we restrict ourselves to Commission documents. After all, the Commission designed the mandate and is authorized to and responsible for the execution of this policy based on the TFEU.
This soft law framework is more specific regarding smart grids and, therefore, contains more relevant sources on EU aims for smart grids, as opposed to the official legal framework discussed above. We will discuss these documents to obtain a better understanding of the Commissions policy on smart grids. We analyzed which aims are mentioned most frequently in these documents.[290]

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[286] Regulation 45/2001 on the protection of individuals with regard to the processing of personal data by the Community institutions and bodies and on the free movement of such data, OJ 2001 L 008.
[287] Hijmans, H. (2006) The European data protection supervisor: the institutions of the EC controlled by an independent authority. *Common Market Law Review*,43(5), p. 1316.
[288] Directive 2002/58/EC concerning the processing of personal data and the protection of privacy in the electronic communications sector, OJ 2002 L 201.
[289] Poullet, Y. (2006) EU data protection policy. The Directive 95/46/EC: Ten years after, *Computer Law & Security Review*, 22(3), p. 216.
[290] More specifically, each mention of an aim in a document only counts once per document. In other words, if one document refers to energy efficiency as an aim of smart grids three times, this only counts as one time.

From nineteen soft law documents addressing smart grids aims written since 2007, we distilled several main aims for smart grids.[291] One overlapping aim is reducing climate change or carbon emissions to which six documents directly refer.[292] To note, not all of these documents focus on energy. For example "A Digital Agenda for Europe", which is part of DG CONNECT, considers that "[s]mart grids are essential for the move to a low carbon economy".[293]

A more specific carbon reducing measure is the integration and increase of renewable energy. Twelve documents mention this measure as one of the purposes for the deployment of smart grids.[294] This is mainly expressed in phrases that suggest a high penetration of renewable energy sources in the electricity grid. For example the documents state the "full potential of renewable energy", allowing the "large-scale integration of renewables", or enable "the mass integration of intermittent renewable energy sources". Furthermore, eleven documents indicate that increasing energy efficiency is an important reason to make the transition to smart grids.[295] This is also part of the overall aim of reducing carbon emissions. Energy efficiency can then be achieved

[291] As list of these documents can be found in the annex of this research.

[292] Commission Staff Working Document: Set-Plan SEC/2007/1510, p. 36, Commission Communication: A public-private partnership on the Future Internet COM(2009)479, p. 5, Commission Communication: A Digital Agenda for Europe COM(2010)245, p. 28, Commission Staff Working Document: 1st radio spectrum policy programme SEC/2010/1034, p. 47, Commission Communication: EU 2020 Flagship initiative COM(2010)546, p. 42, Commission Communication: Communication Roadmap competitive low carbon economy in 2050 COM(2011)112, p.7.

[293] Commission Communication: A Digital Agenda for Europe COM(2010)245, p 28.

[294] Commission Staff Working Document: Set-Plan SEC/2007/1510, p. 36, Commission Communication: A public-private partnership on the Future Internet COM(2009)479, p. 5, Commission Communication: Analysis of options to move beyond 20% greenhouse gas emissions COM(2010)265, p. 6, Commission Communication: Energy 2020 A strategy for competitive, sustainable and secure energy COM(2010)639, p. 10 Also its accompanying staff working document, Energy 2020 A strategy for competitive, sustainable and secure energy COM(2011)21, p. 12, Commission Communication: Communication Roadmap competitive low carbon economy in 2050 COM(2011)112, p.7, Commission Staff Working Document: Definition, expected services, functionalities and benefits of smart grids, SEC (2011)463, p. 2, Commission Recommendation: Recommendations on preparations for smart meter roll-out 2012/148/EC, OJ 2012 L 73, p. 9, Commission Staff Working Document: Industrial policy communication update A stronger European industry for growth and economic recovery, SWD(2012)297, p. 33, Commission Recommendation: Recommendation on mobilising ICT to facilitate the transition to an energy-efficient, low-carbon economy 2013/105/EC, OJ 2013 L 51, p. 20, Commission Communication: Long term infrastructure vision for Europe and beyond COM(2013)711, p. 9, Commission Recommendation: Recommendation on data protection impact assessment template for smart grids and smart meters 2014/724/EU OJ 2014 L 300, p.63.

[295] Commission Staff Working Document: Set-Plan SEC/2007/1510, p. 36, Commission Communication: Analysis of options to move beyond 20% greenhouse gas emissions COM(2010)265, p. 6, Commission Staff Working Document:1st radio spectrum policy programme SEC/2010/1034, p. 47, Commission Communication: Energy 2020 A strategy for competitive, sustainable and secure energy COM(2010)639, p. 10 Also its accompanying staff working document, Energy 2020 A strategy for competitive, sustainable and secure energy COM(2011)21, p. 12, Commission Communication: energy efficiency plan 2011 COM(2011)109, p. 14, Commission Communication: Roadmap competitive low carbon economy in 2050 COM(2011)112, p.7, Commission Recommendation: Recommendations on preparations for smart meter roll-out 2012/148/EC, OJ 2012 L 73, p. 9, Commission Staff Working Document: A stronger European industry for growth and economic recovery, SWD(2012)297, p. 33, Commission Recommendation: mobilising ICT to facilitate the transition to an energy-efficient, low-carbon economy 2013/105/EC, OJ 2013 L 51, p. 20, Commission Recommendation: Recommendation on data protection impact assessment template for smart grids and smart meters 2014/724/EU OJ 2014 L 300, p.63.

through either less consumption on the demand side or through a more efficient energy system including, for example, a more efficient electricity generation unit. Several less prominent aims of smart grids recur throughout these documents. They are listed in order of frequency: increasing consumer participation/awareness[296], integrating electric vehicles [297], supporting a competitive energy market [298], supporting distributed/decentralized production of energy[299], enabling demand side management[300], making the energy market and prices more transparent[301], enabling electricity storage[302], and security of supply[303].

By assuming that the more often documents refer to certain objectives the more important the objective is, it can be concluded that in the analyzed documents, the aims that are part of reducing carbon emissions predominate. This, naturally, is in line with the objectives we came across in the previous paragraphs. The Third Electricity Directive referred to modernizing the grid to support decentralized production and energy efficiency. The Energy Efficiency Directive obviously regards smarts grids as a means to achieve additional energy efficiency and the Commission Decision and Renewable Energy Action Plans take the view of supporting the integration of renewable energy. There are also several aims for smart grids that are beneficial to the user. They are increasing consumer participation and awareness and transparency of prices. As this part specifically addressed the aims for smart grids, privacy and data protection are not discussed. These pertain to specific requirements, which we will address in the following sections.

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[296] Commission Communication: A public-private partnership on the Future Internet COM(2009)479, p. 5, Commission Communication: Energy 2020 A strategy for competitive, sustainable and secure energy COM(2010)639, p. 10, Commission Communication: energy efficiency plan 2011 COM(2011)109, p. 14, Commission Staff Working Document: Definition, expected services, functionalities and benefits of smart grids, SEC (2011)463, p.2, Commission Recommendation: Recommendations on preparations for smart meter roll-out 2012/148/EC OJ 2012 L 73, p. 9.

[297] Commission Communication: A resource-efficient Europe – Flagship initiative under the Europe 2020 Strategy COM(2011)21, p. 12., Commission Staff Working Document: A stronger European industry for growth and economic recovery, SWD(2012)297, p. 33, Commission Recommendation: mobilising Information and Communications Technologies to facilitate the transition to an energy-efficient, low-carbon economy, 2013/105/EC, OJ 2013 L51 p. 20.

[298] Commission Staff Working Document: Set-Plan SEC/2007/1510, p. 36, Commission Staff Working Document: Definition, expected services, functionalities and benefits of smart grids, SEC (2011)463, p. 2, Commission Staff Working Document: Energy Technologies and Innovation, SWD(2013) 158, p. 56.

[299] Commission Staff Working Document: Set-Plan SEC/2007/1510, p. 36, Commission Communication: Roadmap competitive low carbon economy in 2050 COM(2011)112, p.7.

[300] Commission Communication: Roadmap competitive low carbon economy in 2050 COM(2011)112, p.7. Commission Communication: Long term infrastructure vision for Europe and beyond COM(2013)711, p. 9.

[301] Commission Communication: Energy 2020 A strategy for competitive, sustainable and secure energy COM(2010)639, p. 10.

[302] Commission Staff Working Document: A stronger European industry for growth and economic recovery, SWD(2012)297, p. 33.

[303] Commission Staff Working Document: Set-Plan SEC/2007/1510, p. 36, Commission Staff Working Document: Definition, expected services, functionalities and benefits of smart grids, SEC (2011)463, p. 2, Commission Recommendation: data protection impact assessment template for smart grids and smart meters 2014/724/EU OJ 2014 L 300, p.63.

4.4 Smart grid aims and requirements with respect to standards

In the first part of this chapter we described the legal framework and the relevant aims and requirements for smart grids. In the previous section, we analyzed the policy aims for smart grids in soft law. In this section, we review soft law that specifically concerns the smart grid standardization.

First of all, the Third Electricity Directive indicates in preamble 27 that if Member States develop smart grids, they should be built in such a way that it encourages decentralized production and energy efficiency.

With regards to European standardization, several documents consider that standards are necessary to provide interoperability.[304] A crucial procedural element in the technical development of smart grids is that the architecture should remain open and inclusive, so that SMEs can participate fully.[305] Moreover, Chapter 3 of the Commission staff working document accompanying the Communication of "Smart Grids: from innovation to deployment" describes the necessary functionalities for smart grids.[306] These are based on the findings of the Smart Grid Task Force. This Task Force was set up in 2009 and issued key recommendations regarding the deployment of the smart grid in the EU, such as the Communication smart grids: from innovation to deployment.[307] The document lists six categories:

1. Enabling the network to integrate users with new requirements
2. Enhancing efficiency in day-to-day grid operation
3. Ensuring network security, system control and quality of supply
4. Better planning of future network investment
5. Improving market functioning and customer service
6. Enabling and encouraging stronger and more direct involvement of consumers in their energy usage and management

Each category sets out detailed and extensive requirements. However, they are not binding in the standardization process because it concerns Commission staff working documents.

[304] E.g. Commission Communication: Energy 2020 A strategy for competitive, sustainable and secure energy, COM(2010)639 or European Parliament resolution of 6 May 2010 on electric cars, OJ 2011 C 81/E.
[305] Commission Communication: Smart Grids: from innovation to deployment, COM (2011)202.
[306] Commission Staff Working Document: Definition, expected services, functionalities and benefits of smart grids, SEC (2011)463.
[307] Commission Communication: Smart Grids: from innovation to deployment, COM (2011)202.

Finally, the Annual Work Programs for European standardization of the Commission declare the objectives for smart grid standardization. As discussed in Chapter 3, these work programs have been mandatory since the New Regulation on Standardisation. The 2013 work program states that "[a]dequate infrastructure, including storage and capacity balancing solutions, is needed".[308] Storage and capacity balancing solutions are, therefore, requirements for smart grids. The 2014 working program refers to the 2013 program in relation to smart grids.

4.5 Conclusion

In this chapter we addressed subquestion SQ2: What are the EU policy aims and requiremetns for smart grids? Energy legislation is not quite explicit regarding the aims or requirements for smart grids. However, several legislative documents mention smart grids as a means for the aim of integrating renewable energy and supporting energy efficiency. To this respect, smart grids are also viewed as a means to ensure the proper functioning of the market. Maintaining security of supply is moreover a vital requirement for smart grids.

The Third Electricity Directive is also very specific regarding the necessity for consumer protection. Although not explicitly mentioned in relation to smart grids, these measures for consumer protection are crucial for the development of smart grids. More specifically, smart grids need to provide privacy protection to the consumer. EU directives and regulations specifically address data and privacy protection.

The soft law EU policy documents regarding smart grids are more explicit regarding the aims and requirements. The aims of promoting energy efficiency and the development of renewable energy clearly prevail in these documents. These documents are also quite specific on the requirements for smart grids, such as security and storage and capacity for grid balancing.

The review of the legislative framework and the policy framework makes clear that an explicit legal basis that specifically provides requirements for smart grids is lacking. The closest legal basis to such a requirement can be found in the Third Electricity Directive stating that smart grids should be built in a way that encourages decentralized production and energy efficiency. Soft law contain aims and requirements for smart grids and even indications for specific technical requirements for smart grids; however, they do not provide a legal ground for ESOs or market parties to consider these requirements in standardization.

[308] Commission Communication: The annual Union work programme for European standardization, COM(2013)561, § 2.1.6.

Apart from the fact that the policy aims and requirement are spread out in policy documents they can even contradict each other. To name a few tensions between the separate aims and requirements: the integration of renewable energy can threaten the security of supply. The pursuit of demand side management can deteriorate consumer privacy protection as well as the protection of the vulnerable customer. Even if these aims would be taken into account they still need to be balanced.
Before going into the question of how these aims need to be safeguarded in standardization, we will address the question of what the legal status of standards is in the next chapter.

Smart grid policy aims and requirements

Carbon emission reduction
- Electric vehicles (a)
- Decentralized energy sources (a)
- Enable storage (a)
- Consumer awareness (a)
- Demand side management (a)

Functioning of the market
- Quality of service (r)
- Demand response (a)
- Ensuring security of supply (r)
- Security (r)
- Interconnection of networks (r)

Consumer protection
- The ability to choose and switch supplier (r)
- Protection of the vulnerable customer (r)
- Privacy protection (r)
- Access to services (r)
- Enjoy a reasonable price (r)
- Transparency of billing (r)

Figure 4.1 Policy aims and requirements

To make this analysis comprehensible, we categorized the different aims and requirements of smart grids, described in this chapter into three groups, with (a) being

aims and (r) requirements. Most of these categorizations are self-evident. However, a few need some further explanation.
First, the use of electric vehicles by itself does not result in an increase of the use renewable energy. However, non-electric vehicles use non-renewable energy by definition. Electrifying transportation therefore opens the possibility to an increase of renewables. Second, decentralized energy sources do not necessarily denote renewable energy sources. However, in the majority of cases the decentralized source will also be a renewable source and therefore this belongs to the category of integrating renewables. Obviously, other categorizations are also possible in relation to EU energy policy.[309]

[309] see e.g. Andoura, S., et al. (2010) *Towards a European Energy Community: A Policy Proposal*, Policy Proposal by Jacques Delors, Notre Europe, p. 26, retrieved on 1 January 2015: http://www.europarl.europa.eu/meetdocs/2009_2014/documents/envi/dv/201/201006/20100602_envi_study_energy_policy_en.pdf, consisting of affordable access to energy, sustainable development, and security of supply, or Commission Communication: an energy policy for Europe, COM(2007)1, p. 3-4 consisting of sustainability, security of supply and competitiveness.

5 The legal status of standards

In this chapter we answer subquestion SQ3: what is the legal status of standards? By reviewing standards in relation to the theory of code is law, we show how standards regulate. Furthermore, we will discuss the necessity for procedural and substantial safeguards in developing standards.

5.1 Introduction

> "Every age has its potential regulator, its threat to liberty. Our founders feared a newly empowered federal government; the Constitution is written against that fear. [...] Ours is the age of cyberspace. It, too, has a regulator. This regulator, too, threatens liberty. But so obsessed are we with the idea that liberty means "freedom from government" that we don't even see the regulation in this new space. We therefore don't see the threat to liberty that this regulation presents."[310]

This quote from Lawrence Lessig, the mind behind the theory of "code is law", illustrates the topic of this chapter: code, or in this case standards, as a regulator.
The rapid development of technology over the recent decades has been accompanied by increased dependence on those technologies. The question that arises is what place technology has in the legal systems that were developed long before the digital era. The potential for technology to regulate behavior is vast. In the beginning of this book, we discussed the impact the technical design of the smart meter could have on users' privacy and their ability to become more energy efficient. We will now review the debate on the role technology currently plays in the legal system. In this review, we will explain how the normative effects of code come to be and what its consequences are.
The basis for this exploration is Lawrence Lessig's theory "code is law". He wrote the book Code and other Laws of Cyberspace in 1999, in which he describes his theory of "code is law".[311] He explains how Internet code controls the way users can operate online. It clearly sets out the role of code as a regulator. Obviously Lessig's theory is not the only, nor the first to discuss this topic. We discuss Lessig because his book generated a paradigm shift through its successful and

[310] Lessig, L. (1999). Code is law. *The Industry Standard*, *Harvard Magazine*, retrieved from: http://harvardmagazine.com/2000/01/code-is-law-html
[311] Lessig, L. (2006) *Code, version 2.0,* New York: Basic Books.

clear exposition of the capacity of code to regulate, next to direct governmental regulation.

Code, in this sense, points to the hardware and software that make cyberspace what it is.[312] It is the structure or architecture that defines programs. Standards, in a way, are a genus of code. When code represents an agreement that is followed a sufficient number of developers, it becomes a standard. Therefore, this theory provides important insights with respect to how standards are a kind of regulator.

The theory has raised a great deal of discussion in legal scholarship, other fields of academia, and even outside academia, and it continues today.[313] The feedback on his book was so substantial that Lessig decided to rewrite the book in 2006 under the name Code 2.0.[314] In this chapter, we will elaborate on Lessig's theory and the debate it evoked. Because the theory focuses primarily on the use of the Internet, the implications are directly related to the user of the Internet. As we will see, in other areas of technology, the implications illustrated by "code is law" can go beyond the user and impact society as a whole. These implications can also be related to the aims and requirements discussed in the previous chapter, such as carbon emission reduction or the security of supply of the electricity system. After reviewing how code regulates and why it should or should not be considered as law, we will extend the discussion to standards. We will assess whether the arguments for code not be considered law hold up to scrutiny with regard to standards. Finally, following these theoretical reflections, we will observe the way the judiciary deals with the question of the legal status of standards.

In the next section, we will start with providing an overview of the history on thinking about the Internet.

5.2 Organizations regulating the Internet

Irrespective of who might best regulate the Internet, several organizations have coordinated aspects of the Internet from an early stage. This type of institutionalized regulation was necessary for the Internet to work as it does today. We discuss these organizations to demonstrate the most evident way in which the Internet is regulated. Their rules are required to access and

[312] Ibid., p.5.
[313] On 30 November 2014 the book had 3387 citations according to Google Scholar.
[314] Lessig, L. (2006) *Code, version 2.0,* New York: Basic Books.

communicate on the Internet and thus everyone is subject to this regulation.[315] This type of regulation is much more acknowledged as a way of regulation than the regulation of "code is law".

The Internet Society (ISOC), is a non-profit organization that encompasses several organizations, including the Internet Engineering Task Force (IETF), which sets most of the international IP standards. The Internet Corporation for Assigned Names and Numbers (ICANN) is a non-profit organization established by Californian law. It manages all domain names and the top-level domains such as .com, .edu, .eu, .nl etc. and allocates the domains of browser URLs.[316]

What these organizations have in common that they are non-profit organizations that decide on general rules and policies that apply to the Internet. They are, however, not public authorities or part of the system of international public organizations. An important issue with these organizations is that they can create prejudice against certain countries, with most of these organizations being based in the US. Therefore, their policy is likely to favor the US situation, and overlook interests of other countries. In response, the World Summit on the Information Society (WSIS) brought up the discussion of more global governance for the Internet with state and non-state actors.[317]

On a national level, the Internet Service Providers (ISPs) are companies that connect consumers to the Internet via copper or fiber cables. The contract users have with the ISP allows the customer access with the help of a modem. These contracts explain the rights and obligations of parties and, for example, the exemptions of accountability for web content. Most ISP contracts contain terms that directly influence the way the customer uses the Internet. For example, under certain circumstances, ISPs can block specific harmful content or even deny access to certain websites.[318] They can also subscribe to blacklists that inform them of which servers produce spam and consequently block traffic originating from those servers. Consumers consent to these terms yet obviously

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[315] Hof, S., & Stuurman, C. (2006) Code As Law?, in: Koops, B., et al. (eds) *Starting Points for ICT Regulation*, The Hague: T.M.C. Asscher Press, p. 221.

[316] Froomkin, A. (2000) Wrong Turn in Cyberspace: Using ICANN to Route around the APA and the Constitution, *Duke LJ*, 50(1).

[317] Mueller, M. (2010) *Networks and States, The Global Politics of Internet Governance,* Cambridge: The MIT Press p.55-80.

[318] The blockage of users from websites is in most cases deemed unlawful, however several ISPs for longer or shorter time blocked the website The Pirate Bay on order of national agencies. See also: Case C-70/10 Scarlet Extended SA v Société belge des auteurs, compositeurs et éditeurs SCRL (SABAM) ECLI:EU:C:2011:771 and Opinion of the Advocate General Cruz Villalon delivered on 26 November 2013 Case C-314/12 UPC Telekabel Wien GmbH v Constantin Film Verleih GmbH and Wega Filmproduktionsgesellschaft GmbH, ECLI:EU:C:2013:781.

have no individual say in them. To this extent, ISPs regulate the use of the Internet to a certain level as well.
Thus, in general, there are different ways in which the Internet is regulated by private organizations. These organizations vary from internationally operating organizations that designed the architecture to the national ISPs. In the next section, we will look at the regulation of the Internet in a broader sense. This regulation does not necessarily occur through coordinated rules, or private contracts, but through the way the Internet and its services work. To this end, in the following section, we will elaborate on Lessig's work of "code is law", which provides a useful perspective for thinking about the Internet and new technologies in general.

5.3 Code according to Lessig

> "As life moves onto the Net, more of life will be regulated through the self-conscious design of the space within which life happens. That's not necessarily a bad thing. If there were a code-based way to stop drunk drivers, I'd be all for it. But neither is this pervasive code-based regulation benign. Due to the manner in which it functions, regulation by code can interfere with the ordinary democratic process by which we hold regulators accountable."[319]

The theory of "code is law" addresses the notion that on the Internet, the rules are not simply legal rules set by governments; but rather, rules are mostly determined by the architecture of hard- and software code. This notion is of importance in the information age[320] because more and more services for citizens- smart grids being one of them- depend on the use of the Internet. Lessig's theory was written in a U.S. context, yet the aspect of how code binds users is equally applicable for the EU system. The theory provides important insights with respect to how standards are a type of regulator. Lessig argues that because of the powerful ability of code to regulate, procedural safeguards, as a constitution for code development is necessary.

> "I mean an architecture—not just a legal text but a way of life—that structures and constrains social and legal power, to the end of protecting

[319] Lessig, L. (2006) *Code, version 2.0,* New York: Basic Books, p.138.
[320] Information age refers to the period of time since the mainstream use of personal computers and interconnection thereof, see e.g. Mason, R. (1986) Four ethical issues of the information age, *Mis Quarterly*,10(1) p. 5.

> fundamental values {...} we mean constitution as in lighthouse—a guide that helps anchor fundamental values."[321]

Because code regulates, there lies a threat that this regulation conflicts with certain common values of society. Some of the most obvious issues in relation to the Internet are values of privacy protection and freedom of speech. The way in which code is developed can frustrate these values. In code development safeguards need to be set in place to avert conflicts with these values. These safeguards should ensure that the decisions made in code development consider common values, just as procedural principals function to protect those values in developing law.

5.3.1 How code regulates

The architecture of the Internet and its content determines the possible activities of users as well as it limits their activities. Code can be seen as a form of law of the Internet, in the sense that users are bound by its possibilities and restrictions, without directly consenting to them. This perspective can be placed in the perspective of the discussion that started at the end of last century with, amongst others, Joel Reidenberg's theory of "Lex Informatica".[322] Lawrence Lessig builds upon this theory by introducing the concept of "code is law", and with that, he broadens the debate on the role of the Internet in society. The theory still instigates questions on how to deal with the development of the Internet today.

Lessig argues that on the Internet, code is a salient regulator. Instead of laying down rules that need to be followed, code builds these rules into the architecture. The rules need to be followed, if one wants to make use of a code-based service, and are embedded in its architecture. In his book Lessig gives examples of how code in the development of the Internet is employed to achieve certain objectives that regulate user behavior. "These technologies were built to make business work better."[323] Code can be a type of "design with intent" when it is used to shape behavior to adhere to business models.[324] When regulation is built into code it also determines which values are upheld, and therefore it is important to assess which freedoms and constraints the code allows. In the following sections we will give examples of technologies that were developed for certain business

[321] Lessig, L. (2006) *Code, version 2.0,* New York: Basic Books, p. 4.
[322] Reidenberg, J. (1998) Lex Informatica: The Formulation of Information Policy Rules Through Technology, *Tex. L. Rev,* 76(3).
[323] Lessig, L. (2006) *Code, version 2.0,* New York: Basic Books, p. 61.
[324] Lockton, D., et al. (June 4-6 2008) Design with intent: Persuasive technology in a wider context, presented at Third International Conference Persuasive Technology, p.275.

aims. We will also address how these technologies influenced the values and freedoms for users. With these examples we demonstrate how code regulates.

5.3.1.1 IP- addresses

One of Lessig's examples that illustrate how code functions as the "law" of the Internet is the use of Internet Protocol (IP) addresses for access to the Internet. The Internet Protocol is a standard in itself. When governments and companies developed the need to know where in the world a user was, the IP-address provided a solution: each device that is connected to the Internet needs to be assigned such an IP-address. Standardizing IP-addresses based on country of use helped in determining the user's whereabouts.[325] The country codes are stored in Regional Internet Registries. This allowed industry to advertise based on the relevant region. Another possibility provided by the standardized IP-addresses arranged by country is the possibility to restrict the use of services for different countries. For example, a paid subscription for Netflix in the Netherlands only allows the user to view content that is intended for Dutch users. The Netflix user profile itself does not discriminate between countries in the sense that your Dutch subscription only grants access to content for Dutch use. However the service detects the users' IP-address and subsequently determines what content will be available based on the country to which the IP-address belongs. Therefore, the user will not be able to watch Netflix in a country where it is not introduced. Moreover, without the use of circumvention tools a Dutch user has less choice between content than an American user. This way, Netflix regulates users to abide by its Terms of Use that users "may view a movie or TV show through the Netflix service only in geographic locations where we offer our service and have licensed such movie or TV show".[326] In this case the users have to follow the rule that they can only watch the content designated for their country by Netflix. Code by use of the IP standard as a means to determine location functions as a technical mechanism to enforce this rule.

5.3.1.2 Cookies

Another example relates to the ability of user identification of the Internet. There used to be no way for websites to identify their users while navigating through the site. This meant that online shopping was impossible since paying for certain items would mean that the user would have to navigate to the next steps. Yet while going from the page on which the item was selected to the shopping

[325] This can of course quite easily be circumvented by using a VPN connection, yet most users do not use this possibility, if they already know how to.
[326] Netflix Terms of Use, art. 6C retrieved on 23 October 2014: www.netflix.com/TermsOfUse

basket, the information would be lost as the website was not able to identify the user. For example, if users wanted to buy a book, they would select the book and then go the link to fill out his personal details. Without a mechanism of identification, the website could not distinguish what item was related to these personal details. Here again, industry found a way to regulate by using code. By sending a piece of data known as a cookie from the website to the users' browser, the website was able to recognize the user while moving through their website, enabling them to sell their products to customers. Other uses of cookies are the identification of users when returning to a specific website or tracking their browsing behavior on their own website. Moreover, third parties can track browsing behavior through different websites by using tracking cookies.[327] They therefore provide the possibility of targeted advertising of a product someone shopped for online on an unrelated website. Cookies regulate users because they need to abide by the way cookies function. Users can choose to disable cookies, however if they want to make use of the services requiring identification, they have no other choice but to allow for cookies to be stored.

5.3.1.3 DRM in HTML5

An eminent technical regulation to control the use of digital media is digital rights management (DRM). DRM is employed to protect the use and distribution of online media, such as music and videos.[328] DRM can, for example, support the regulation of reselling of acquired content, store personal data, and determine on what devices content can be played.[329] The new HTML standard, HTML5, contains an extension for playback that allows for the incorporation of usage control that restricts users in copying videos from websites.[330] The extension is called Encrypted Media Extensions (EME) and enables plugins for types of DRM that makes it difficult for users to duplicate content. The proposal to include the EME in the HTML5 standard was pushed by Google, Microsoft and Netflix.[331] Mozzilla Firefox, an open source Internet browser, eventually

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[327] Helberger, N. (3-5 May 2013) *Freedom of expression and the Dutch cookie-wall*, MIT 8 Public Media Private Media Conference, p. 3.

[328] Liu, Q., et al. (January 2003) *Digital rights management for content distribution* presented at the Australasian information security workshop conference on ACSW frontiers.

[329] Helberger, N., et al. (2004) *Digital rights management and consumer acceptability: A multi-disciplinary discussion of consumer concerns and expectations*, state of the art report for INDICARE, p. 20-26, retrieved 1 January 2015: http://www.ivir.nl/publicaties/download/253

[330] According to the Editors Draft it does not regard DRM, yet what it comes down to is that it does exactly this: manage digital rights, only with a d-tour. It ensures a way of implementing DRM. According to the Electronic Frontier Foundation claiming that no DRM is added in the HTML5 specification is like "we're not vampires, but we are going to invite them into your house", retrieved 18 August 2014: https://www.eff.org/deeplinks/2013/03/defend-open-web-keep-drm-out-w3c-standards

[331] Encrypted Media Extenstions, W3C Editors Draft, Retrieved on 28 July 2014: https://dvcs.w3.org/hg/html-media/raw-file/default/encrypted-media/encrypted-media.html.

decided to comply with the EME because pressure from media companies threatened to otherwise make Firefox obsolete.[332] Because all mainstream browsers will now comply with this standard, Internet users will face restrictions of what they can copy from websites. Because the standard contains an extension that allows for plugins that restrict the users to do with the content shown on their computer as they please, users are regulated by code to not infringe on the copyright through code as opposed to being regulated by law.

5.3.1.4 Emotional state on Facebook

A final example illustrates that code can regulate beyond behavior and goes as far as influencing the ways in which individuals express themselves without them being aware that this is regulated by code. In a study of 689.003 Facebook users, negative or positive posts were filtered from their news feed. Subsequently, users posted more posts consistent with the posts that remained.[333] The study showed that when negative feeds were removed from the Facebook (in compliance with their Data Use Policy) users posts were more positive. Likewise, when positive feeds were removed from Facebook, users' posts were more negative. The study of Facebook news feeds shows that, next to regulating people's behavior, code can regulate the ways in which individuals express themselves. The architecture of Facebook's code allows Facebook to manipulate the content in the news feeds and creates the option to regulate the ways in which people express themselves in their status updates.

5.3.2 Other aspects of "code is law"

In this section we elaborate on the different aspects of "code is law".

One perspective Lessig takes in discussing code is that code is one of four mechanisms control people in a certain way.[334]

The law controls people by describing what they should or should not do and by stating the consequence of doing otherwise. Social norms control people because not adhering to the norm can have negative consequences for their relationship with others. Market mechanisms can control people as prices determine whether a person will buy a good or service. Finally, architecture can restrain or encourage people to do something through the environment. For example, traffic spikes at parking lot entrances will deter people from leaving the parking lot at the

[332] Schrock, A. (2014) HTML5 and openness in mobile platforms. *Continuum*, 28(6) p. 828.
[333] Kramer, A. et al. (2014) Experimental evidence of massive-scale emotional contagion through social networks, *Proc Natl Acad Sci USA,* 24.
[334] Lessig, L. (2006) *Code, version 2.0*, New York: Basic Books, p. 121-125.

entrance and avoiding the pay booth because it will destroy their tires. Code on the Internet represents the regulating mechanism of architecture offline. In this context, Lessig argues that code is the most powerful of the four powers.

As another part of the concept of "code is law", Lessig puts forward the notion that governments can also utilize code to regulate. There is a distinction between "West Coast Code" when it is about the rules made by software companies (mostly based in Silicon Valley), and "East Coast Code" when relating to legal rules made by the government (in Washington D.C.). What distinguishes West Coast Code from East Coast Code is that commercial interests of the market develop code, creating a kind of privatized law. Instead of processes guided by constitutional rules to safeguard common values, individual engineers develop these codes often to pursue commercial interests.
Governments can also use West Coast Code instead of East Coast Code to embed laws and policy aims in technology in order to enforce those rules, a type of techno-regulation. Whereas the law can merely forbid an act, technology can make the act impossible. In other words, the law can prohibit, whereas the code can inhibit.

In fact, it is easier to deviate from East Coast Code than from West Coast Code. In the end, with government develops (legal) rules anyone can still undertake the prohibited action and accept the possible consequence. In contrast, code limits and restricts possibilities; therefore, code is more difficult or even impossible to circumvent. Code is a way of social shaping, which does not allow for the option not to obey.[335], When the regulatory force comes from the environment or the architecture, it is even more difficult to recognize that one is being regulated.[336] It does not allow for individuals to choose between right and wrong; they are forced by code to do "right".[337]
A situation of using West Coast Code could, for example, occur when a government aspires to keep track of all of the data traffic within its territory. Using East Coast Code it would need to get a bill through the legislative process to oblige all ISPs to store these data. Using West Coast Code, it could circumvent this process by stimulating the use of a certain standard for data retention by ISPs that automatically stores all data traffic that comes through the

[335] Latour, B. (1992) Where are the missing masses? The sociology of a few mundane artifacts. In: Bijker, W. & Law, J. (eds.), *Shaping Technology,* Cambridge: The MIT Press.
[336] Berman, P. (2000) Cyberspace and the state action debate: the cultural value of applying constitutional norms to "private" regulation, *U. Colo. L. Rev.*, 71.
[337] Brownsword, R. (2005) Code, control, and choice: why East is East and West is West, *Legal Studies*, 25(1).

ISPs and stores it for ten years. Likewise it could stimulate content filtering systems that make it impossible for users to access websites that contain illegal content. In this way, citizens inevitably abide by a law that prohibits looking at the content. Because the content is inaccessible, they are simply unable to view it. Moreover, they probably do not know that they are being regulated.

Finally, when using West Coast Code, the procedural requirements that would normally be required in the case of preparing legislation are circumvented.

Note that using West Coast Code to achieve the policy aims for smart grid policy aims and requirements is not what we propose as a means to safeguard policy aims and requirements for smart grids in this research. Using techno-regulation to achieve policy aims pertains more to regulatory standards as opposed to coordinative standards, and is similar to what is done in the New Approach to Standardization.[338] In techno-regulation the government executes their policy by embedding regulation in technology. In the case of smart grids standards, recall that this standardization process is not part of New Approach standardization. Therefore, the aim of standardization is not to execute the policy in relation to smart grids, but merely interoperability. In this research we explicitly not suggest that that policy aims and requirements should be met by means of standardization. This would constitute techno-regulation. In contrast, we do argue that code regulates and because of that there are safeguards necessary to protect the obstruction of smart grid policy aims and requirements in a process of standardization that focuses on interoperability.

5.3.3 Code is law as nudging

The concept of "nudging" is not part of the theory of "code is law". Yet, in a way, it is very similar. In the field of behavioral economics, this theory provides additional insights into the idea of regulation through code. Thaler and Sunstein introduce "libertarian paternalism" as a way to nudge people in a desired direction, without depriving people of their choice.[339] The theory is relevant for all of the types of architecture we discussed in 5.4.2, as well as code. Instead of focusing on the potential of architecture to regulate by reducing choice, they propose the use of architecture to help people make better choices without doing away with choice. "Better" in this sense can vary from the improvement of health

[338] An important difference is that the East Coast Code is explicitly laid down in a directive, while in the case of techno-regulation, this step is skipped and regulation is (without underlying East Coast Code) built into technology.
[339] Thaler, R. & Sunstein, C. (2008) *Nudge: Improving decisions about health, wealth, and happiness*, Yale: University Press.

to people's energy efficiency.[340] Architecture is arranged in such a way that makes it more attractive for people to choose the best option. One way to establish this is by default settings. Most smart phones have an energy efficiency mode. Nonetheless, very few phones have this as a default setting. Because users are less likely to change the default setting, this is a potential means of energy saving. If the default setting were the energy efficiency mode, most users would not change it and thus would be nudged towards energy efficiency. As opposed to "code is law", users that do not want the energy efficiency mode still have the choice to change it to the normal mode. The other way around, having the default setting as not energy-efficient is a nudge towards inefficiency. This theory shows that architecture not only affects the users' interests, but can also indirectly benefit more general interests, in this case energy efficiency.

In the case of smart grids the role of the household consumer in saving energy and producing renewable energy is crucial, and the interface of technology for the household consumer needs to support this role. Nudging could be an effective way coax the consumer into this role.[341]

We discuss nudging at this point because, intentionally or not, standards could also induce nudges that interfere with smart grid policy aims and requirements. The effects of nudging might be taken into consideration in the development phase of smart grids and consequently the standardization process. Not in the sense that the standards need to contain nudges, which would be more towards the West Coast Code approach. Rather, just as in "code is law" the consequences of nudges should be taken into account.

5.4 Ramifications

The reason code is important from a legal academic point of view is its capability to define behavior on a mass scale.[342]

> "Architecture is a kind of law: It determines what people can and cannot do. When commercial interests determine the architecture, they create a kind of privatized law."[343]

[340] Thaler, R. & Sunstein, C. (2008) *Nudge: Improving decisions about health, wealth, and happiness*, Yale: University Press, p. 99.
[341] Stern, S. (2011) Smart-Grid: Technology and the Psychology of Environmental Behavior Change. *Chi.-Kent L. Rev.*, *86*, p. 158-160.
[342] Wu, T. (2003) When Code Isn't Law. *Va. L. Rev.*, 89.
[343] Lessig, L. (2006). *Code, version 2.0,* New York: Basic Books, p. 77.

Code produces unilateral rules because users do not consent to them. They are imposed on users, and most users do not know how to circumvent these rules. In developing these rules, a clash may occur between economic and non-economic values.[344] In these instances, there are no procedural safeguards that can heed the non-economic values. Consequently, the social implications of new technologies reflect the interests of those that invest in these technologies. This can have legal as well as economic and social consequences.[345]

Some argue that in certain cases, technology should be subject to governmental regulation in order to protect certain interests.[346] Lessig goes even further and asserts that there is a necessity for a constitution-like statute guiding the decisions made in code development. Going back to the distinction between West Coast and East Coast code, the main difference is that in West Coast Code development there are no checks, or procedural safeguards, to govern the process, in contrast to the situation in East Coast Code. Such procedural principles should provide a structure that ensures society has a say in the development of regulation through code. In this way, in code development, common values should be upheld.[347] Just as the government needs to take the procedural principles of lawmaking into account that protect citizens from unjust consequences when developing laws, code developers should abide by principles that ensure that users are not unfairly harmed by the ways in which code works. This step requires procedural safeguards that help to uphold values. The principle of transparency is most prominently discussed as a procedural principle to this end because it allows parties other than the code developers to oversee what, and how users are regulated.
In the theory of law these *values* that need to be protected are assessed on a case-by-case basis. However, speaking of values inherently induces subjectivity. In this research the values are translated into something more workable and objective, namely the EU aims and requirements that are laid down in legislation and soft law. These are established in Chapter 4 in the discussion on the legal framework and policy for smart grids.

[344] Graber, C. (2011) *Internet creativity, communicative freedom and a constitutional rights theory response to "code is law"*, i-call Working Paper no 2010/03, Zurich: Universität Luzern, p. 3.
[345] Koops, B. & Lips, A. (2003) Wie reguleert het internet? Horizontalisering en rechtsmacht bij de technische regulering van het internet, in: Franken, H. (eds.) *Zeven essays over informatietechnologie en recht*, Den Haag: Sdu Uitgevers, p. 262.
[346] Cockfield, A. (2004) Towards a Law and Technology Theory. *Man. LJ*, 30, p. 406.
[347] Lessig, L. (2006) *Code, version 2.0,* New York: Basic Books, p.2.

5.5 Common objections to "code is law"

Understandably, the theory of "code is law" triggered ample resistance. Opponents reject the theory of "code is law" and therefore procedural safeguards for developing code are required. In general there are three overarching objections to the theory of "code is law".[348]

5.5.1 The free choice argument

First and foremost, scholars refute the theory arguing that in a free market, there will always be enough alternatives to choose the technology that suits one's preference best. In relation to the example of Netflix of 5.4.1, one could choose between a whole range of alternatives, such as Amazon Prime, HBO or Cloudload. The reasoning does not necessarily deny that code can regulate; however, it suggests that instead of safeguards for common values in code, there should be the widest possible choice between different technologies so that people themselves can decide which technology satisfies their needs and values.[349] In that sense, code can never be law because one is not required to follow one rule. In other words, one can choose among different rules, and companies will adjust code to meet user's preferences.[350]

5.5.2 Code does not satisfy the criteria of what constitutes law

A second prevalent objection to the thesis of "code is law" is that code does not satisfy the criteria of what constitutes law. The criteria of what constitutes law vary in different legal theories. An important requirement is that the makers of law are recognized governmental authorities. The majority of legal positivist scholars will announce that one fundamental requirement for something to be considered law is that it is developed by a recognized public authority.[351] There has to be a sovereign with power that people obey because they are recognized as authority. As Hart formulates it: "*[A] person or body of persons whose orders the great majority of society habitually obey and who does not habitually obey any other person or persons*."[352] Obviously, code makers cannot be regarded as such.

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[348] For a detailed presentation of different approaches to the theory of code is law, see e.g. Asscher, L. (2006) 'Code' as Law. Using Fuller to Assess Code Rules, in: Dommering, E. & Asscher, L. (eds.) *Coding Regulation, Essays on the Normative Role of Information Technology,* Cambridge: University Press.

[349] E.g. Post, D. (2000) What Larry Doesn't Get: Code, Law, and Liberty in Cyberspace. *Stanford Law Review,* 52(5).

[350] E.g. Kleve, P., & Mulder, R. (2005) Code is Murphy's law, International Review of Law Computers & Technology, 19(3).

[351] E.g. Austin, J. (1861) *The Province of Jurisprudence Determined*, London: Spottiswood, Bentham, J. (1970) Of Laws in General, edited by HLA Hart, London: Athlone Press.

[352] Hart, H. (1961) *The Concept of Law*, Oxford: Oxford University press, p.50.

Furthermore, code does not describe any statements of what is morally best or best for society.[353] In this case, legal philosophers argue that something can be law only when it is based on what is morally "right" or advances society in a way.[354] Code does not meet this requirement. To note, Lessig, at the start of Code 2.0, already states that he does not contest that these differences between law and code exist. "*I don't deny these differences. I only assert that we learn something useful from ignoring them for a bit*."[355]

5.5.3 Code presents nothing new

Finally, some scholars argue that code is not the first non-legal norm that regulates behavior. Therefore, "code is law" is not a new idea. As mentioned in the previous section, it cannot be denied that different mechanisms regulate behavior, such as markets and social norms. The school of legal pluralism embraced this idea some time before the discussions around code arose.[356] The concept of legal pluralism can be interpreted very strictly, composing merely different legal orders applicable to one country.[357] It can also be understood as a theory that non-legal norms also regulate the society of a country.[358] In a similar vein, others note that the Internet is not any more law than other technologies. In this sense, technology is not law, thus nor is code.[359]

5.6 Standards are law

The theory of code is law helped us to see how code can interfere with policy aims and requirements. Similarly standards can have the same effect, as standards in a way are code. We will discuss whether the objections to the theory of code is law hold up when it comes to standards.

Standards to a large extent, determine what we buy and from whom, and they can even determine the level of safety or environmental protection the product provides. They influence the availability of technology, their compatibility with other products, the way buildings are constructed and designed, etc. Moreover, standards can have a great impact on peoples' behavior. An extreme example is

[353] Dommering, E. (2006) Regulating technology: code is not law. in: Dommering, E. & Asscher, L. (eds.) *Coding Regulation, Essays on the Normative Role of the Information society*, The Hague: TMC Asser Press, p. 9.
[354] Dworkin, R. (1978) *Taking Rights Seriously*. Cambridge MA: Harvard University press.
[355] Lessig, L. (2006) *Code, version 2.0,* New York: Basic Books, p. 5.
[356] E.g. Engle Merry, S. (1988) Legal Pluralism, *Law and Society Review,* 22(5), or Griffiths, J. (1986) What is Legal Pluralism, *Journal of Legal Pluralism and Unofficial Law,* 24(1).
[357] Griffiths, J. (1986) What is Legal Pluralism, *Journal of Legal Pluralism and Unofficial Law,* 24(1), p. 1.
[358] Teubner, G. (1991) Two Faces of Janus: Rethinking Legal Pluralism, *The.Cardozo L. Rev.*, 13.
[359] Lastowka, F. (2006) Decoding Cyberproperty, *Ind. L. Rev.*, 40, p. 48.

the increase in the standard for portions in the US, which raised the daily calorie intake of US citizens drastically.[360] These are reasons one can assume that standards are law in any understanding of the term, except for the purely positivist approach.[361]

As for code, Lessig is not the only one to point out the need for a constitutional framework for code to help anchor fundamental values.[362] The application of procedural safeguards and checks and balances are even more so necessary for standardization.[363] Similarly, there is a call amongst legal and political scientists for democratic legitimacy[364], or some type of governmental supervision[365]. In this section we attempt to examine these proposals by reviewing standards against the background of "code is law", and especially by reviewing whether the aforementioned counter arguments to the theory also have a bearing on standards.

5.6.1 Standards in relation to code

Whereas code encompasses all hardware and software that creates the architecture of the Internet, standards have a narrower meaning. With regard to the Internet, standards can be viewed as a genus of the family code in the sense that they represent only the part of the architecture that contains specifications intended for repeated use. Whereas Internet standards pertain to communication standards, there are several other types of standards, such as measurements, energy labeling or procedural standards. In this section we discuss standards in general, not merely Internet standards.

A clear example of how hardware code regulates is the decision not to include the display in the standard for the smart meter. Another example of how code works in standards is the following: There is a standard that ensures that solar panels

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[360] Nielsen, A. & Popkin, B. (2003) Patterns and trends in food portion sizes, 1977-1998, *JAMA-J Am Med Assoc*, 4, p. 450-453.

[361] E.g. Schepel, H. (2005) *The constitution of private governance: product standards in the regulation of integrating markets,* Portland: Hart Publishing, p. 404.

[362] Lessig, L. (2006) *Code, version 2.0,* New York: Basic Books, p. 4.

[363] Berman, P. (2000) Cyberspace and the State Action Debate: The Cultural Value of Applying Constitutional Norms to Private Regulation. *U. Colo. L. Rev.*,71, p. 1307, or Benoliel, D. (2004) Comment, Technological Standards, Inc.: Rethinking Cyberspace Regulatory Epistemology, *CAL. L. REV.* ,92.

[364] Koops, B. & Lips, A. (2003) Wie reguleert het internet? Horizontalisering en rechtsmacht bij de technische regulering van het internet, in: Franken, H. (eds.) *Zeven essays over informatietechnologie en recht*, Den Haag: Sdu Uitgevers, or Kica, E., & Bowman, D. (2013) Transnational Governance Arrangements: Legitimate Alternatives to Regulating Nanotechnologies?. *NanoEthics*, 7(1).

[365] Asscher, L. (2006) 'Code' as Law. Using Fuller to Assess Code Rules, in: Dommering, E. & Asscher, L. (eds.) *Coding Regulation, Essays on the Normative Role of Information Technology,* Cambridge: University Press., p.88, or in case they are referred to in legislation: Vincent, C., & Camp, J. (2004) Looking to the Internet for models of governance, *Ethics and Information Technology*, 6(3).

automatically switch off, once the frequency on the grid rises above 50.2 hertz. This mechanism is standardized in the European standard of EN50438:2007. For the grid stability, it is of course essential that the instabilities of frequencies are not aggravated by decentralized injections of energy from solar panels. In this sense the code regulates the aim of grid stability. Nonetheless, this mechanism is clearly based on the current diffusion of quite low solar power energy injection. When the input of solar power is drastically increased, this mechanism can obviously become rather problematic. Assume that 40% of electricity input is from solar power. When the frequency in the grid would rise above the 50.2 hertz limit, 40% of all electricity input would simultaneously be shut off, resulting in a much more dramatic instability of the grid than would be the case with a frequency of say 50.3 hertz. A standard that would really take the aim of increasing and integrating renewable energy into account, would therefore need to address this situation by, for example, exponentially lowering its input in relation to the exceeding of the 50.2 hertz frequency.[366] Moreover, it is questionable whether this technical solution is actually in line with the EU right to access. In this case solar panels (and all other smaller generators for that matter) are technically blocked from accessing the grid, while the large generators have no such mechanism and, thus, can continue to supply to the grid.

5.6.2 There is no free choice in standardization

The first common objection to "code is law" we discussed concerns the free choice of hard- and software. When there are different options from which to choose, one is not restrained by the rules of code. This argument is certainly valid to the extent that there actually is choice. Standards, however, are accompanied by a reduction of choice. When standards are commonly adopted, the restrictions and possibilities that are supported by that standard are de facto almost impossible to circumvent.[367] For one, as we have seen, people are not aware that they are regulated when the regulation comes from the architecture. Moreover, when a product or service needs to be interoperable with other products or services, compliance with the standard is necessary. As a result, there is no choice but to follow the standard. Thus, the argument that people can just choose other

[366] E.g. Berrang, P., et al. (2012) Dependability results for power grids with decentralized stabilization strategies, Reports of SFB. TR 14 AVACS 83, retrieved 6 January 2015: http://www.avacs.org/Publikationen/Open/avacs_technical_report_083.pdf.

[367] This is acknowledged by the EU Commission in stating that "once a standard has been adopted and widely implemented by the industry and in the absence of competing standards, firms that use these technologies may be severely limited in their ability to use another technology. The very purpose of choosing a standard is that the industry agrees on a specific technological solution rather than alternative technologies." Commission Decision of 4 December 2013, C(2013)8873, §188.

products or services with other features, or rules if you like, does not hold up to scrutiny if these rules are standardized.

In this respect, when observing the effect of standards on the parties that were not part of the standardization process, there is a distinction between the product developer of a relevant product in the first place and the user of the standardized product. Once a standard becomes widely accepted, the product developer will find it hard to circumvent the standard if he wants to have access to the market. Deviating from coordinative standards is often also practically impossible because a lack of interoperability will mean that consumers do not want to purchase the technology. We mentioned in Chapter 3 that deviating from a regulatory standard usually is accompanied by great efforts to prove that the standard complies with essential requirements in the case of New Approach standards. Subsequently, the user of the standardized product will be bound to buy products that comply with the standard and its possibilities and restrictions. Users might be deprived of certain attributes or quality they desire because it is not encompassed in the standard.[368] Neither product developer that was not part of the standardization process nor the end-user consented to the requirements of the standard.[369]

5.6.3 Standards approach the criteria that constitute law

The second main objection to "code is law" is that code does not satisfy the criteria of what legal philosophers regard as the law. First, code is not developed by a recognized authority. Second, code does not describe any statements of what is morally best, or best for society. In other words, it does not contain political decisions.

As to the first criterion: it is certainly true that standard bodies are not authorities that are recognized to set legal rules. In most cases, they are not a governmental agency or public body as such, although in some EU Member states, standardization organizations are a government agency. Nonetheless, it is clear that the ESOs are not recognized public authorities. However, there is an important difference between the individual engineer developing code, and the coordinated process of standardization. To assert that one engineer, or even one company has the responsibility to take societal values, and policy aims and requirements into account in developing code is fundamentally different from imparting some responsibility on the standard setters as a group. Even though it

[368] Dolmans, M. (2003) Standards for Standards, *Fordham Int'l Law Journal,* 26, p. 174.
[369] Winn, J., & Jondet, N. (2008) A "New Approach" to standards and consumer protection. *Journal of consumer policy*, 31(4), p. 471.

cannot be argued that the ESOs or technical committees are a public authority, they definitely have more authority than individual code developers. Their decisions are, in general, considerably more influential than those of individual engineers.

However, standardization can, and often does, involve political decisions. As opposed to the idea that code does not contain policy decisions, standards often have political characteristics. Although coordinative standards are assumed not to contain any decisions that are political by nature, they increasingly do so.[370] Political decisions are bound to be made in the standardization process.[371] No matter how fiercely one tries to maintain that standards affect only technology, they do have consequences for normative issues and economic interests. Moreover, the EU characterizes standards as a policy tool itself.[372] Standards can also have a broad impact on society.[373] They are especially important for the environmental objectives for smart grids. The EUROPE 2020 strategy for smart, sustainable and inclusive growth states that the standardization process is one of the key subjects that need policy changes to boost innovation,[374] which shows that standards are not merely a technical matter but are regarded as an EU policy instrument as well. Standards are a policy tool, for example, in stimulating the internal market by facilitating cross border trade. The New Approach is another example of using standardization as a policy tool.

5.6.4 Standards do present something new

The final major argument against the theory of "code is law" is that code was not the first non-legal norm to regulate behavior, which is quite obvious. Nonetheless, standards can still be a particular type of norm in the sense of "code is law". When realizing the important role that standards play in society, as mentioned above, we believe that it is actually very important to review their current role. They are a clearly different regulator than social norms and market

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[370] E.g. Werle & E. Iversen (2006) Promoting Legitimacy in Technical Standardization, *Science, Technology &Innovation Studies,* 2(1), p. 23 or Joerges, C., et al. (1999) *The law's problems with the involvement of non-governmental actors in Europe's legislative processes : the case of standardisation under the 'new approach',* EUI Working Paper LAW No. 99/9, San Domenico: European University Institute, p. 56. Or Schepel, H. (2005) *The constitution of private governance: product standards in the regulation of integrating markets,* Portland: Hart Publishing, p. 256.

[371] Joerges, C., et al. (1999) *The law's problems with the involvement of non-governmental actors in Europe's legislative processes : the case of standardisation under the 'new approach',* EUI Working Paper LAW No. 99/9, San Domenico: European University Institute, p. 56.

[372] E.g. Commission Staff Working Document, E.S., a proposal for regulation on EU Standardization, SEC(2011)672, p. 1., Commission Communication: A strategic vision for Standards, OJ 2011 C 264, Report from the Commission: The operation of Directive 98/34/EC in 2009 and 2010, COM(2011)853, p.8 (here the mandate itself is mentioned as a policy tool)

[373] Recital 22 of the New Regulation on European Standardisation no. 1025/2012, OJ 2012 L 316.

[374] Commission Communication: EUROPE 2020, A strategy for smart, sustainable and inclusive growth, COM(2010)311.

mechanisms as discussed in relation to legal pluralism. This difference is also expressed in the fact that standards can be developed on governmental request, as is the case with the smart grid standardization mandate.

In a similar vein, some scholars observe standards as a type of self-regulation.[375] They thus acknowledge the idea that standards regulate, see it as nothing new: just another type of self-regulation. When taking a closer look at definitions of self-regulation, standards are quite different. The main difference lies in the fact that self-regulation binds only the parties that develop the regulation, and those that consent with the compliance.[376] Therefore standards are self-regulation in the first place to the extent that they bind the parties actually involved in the standardization process. However, standards also tie in the producers, who do not necessarily consent to the standard, but have no choice because their products need to be interoperable. Moreover, end-users of standardized products are bound by standards but, as we saw, do not consent to them, if they are already aware that they are complying with the standard.

5.6.5 Standards are nearly law

All in all, standards are different from code in general. They reduce choice, can include political decisions, and are very different from existing mechanisms that regulate behavior. Thus they are resistant to the majority of objections to "code is law". However, because standards are not set by a recognized public authority, they do not constitute law in an absolute positivist sense. This raises the question what standards are, if they are not law. In the following sections, we will review case law, to obtain a better understanding of standards within the legal system.

5.7 The legal reality

What we have established so far is that there are several policy aims and requirements for smart grids. These aims and requirements consist of specific EU objectives for smart grids including energy efficiency and the integration of renewable energy and smart grid user interests such as privacy protection. We argued that the current legal framework does not provide sufficient safeguards for these aims in standardization. Subsequently, in this chapter we discussed how standards can enforce compliance by looking at them through the lens of "code is

[375] E.g. Weiser, P. (2001) Internet governance, standard- setting, and self regulation, *N. Ky. L. Rev.*, 28, p. 822.

[376] Hoenkamp, R., et al. (2013) Law and standards - Safeguarding societal interests in smart grids, in: Leenes, R. & Kosta, E. (eds.), *Bridging distances in technology and regulation*, Oisterwijk: Wolf Legal Publishers, p. 109-110.

law". Nonetheless, because standards are not developed by a recognized public authority, they do not satisfy the criteria of what constitutes law in the strictest sense.

Because the current system of standardization thus creates binding rules, be them formal or informal, there is a necessity for balancing interests. These are the general interests of the smart grid policy aims and individual interests of the consumer.

Whereas the previous sections had a more theoretical approach to the issue of the binding nature of standards, in this section, we will review how the judiciary approaches this matter. Quite recently, the Dutch highest national courts and the ECJ have ruled on the legal status of standards.

We will discuss how the insights of viewing standards from the perspective of code is law, combined with recent case law addressing the legal status of standards, emphasize the necessity for additional legal safeguards in the standardization process.

5.7.1 Standards in legislation

Up until this point we only described the situation in which standards operate independent of legal rules, or where they are developed in the context of the New Approach. Whereas at the EU level a directives only refers to standards in the case that they are developed in accordance with that directive through the New Approach, Member States can have different approaches.

Standards can be referred to in legal acts, which can indirectly bestow legally binding force to standards. In some cases, national statutes refer to standards, which can subsequently change the status of the standards. This issue of informal (international) norms entering the national legal order is not unique for standardization. It happens in areas ranging from certification to financial supervision, either by referring to the norms in legal acts, or simply applying in appropriate circumstances.[377] These norms are problematic when their creation did not follow procedures open for participation and access to the norms is obstructed.[378] The standards this section discusses are not developed in line with the act that refers to it, but are created independently.

In the previous section, it became clear that standards, in a strict sense, are not law as such because they are not set by a recognized authority. Most scholars

[377] Besselink, L. (2012) Informal International Lawmaking: Elaboration and Implementation in the Netherlands in: Duquet, S., et al. (eds.) *Informal international lawmaking: case studies*, The Hague: Torkel Opsahl Academic EPublisher, p.134.

[378] E.g. Advies RvS W14.14.0115/IV, ontwerpbesluit handel in emissierechten, retrieved on 1 December 2014: http://www.raadvanstate.nl/adviezen/zoeken-in-adviezen/tekst-advies.html?id=11425

agree that isolated standards are not legally binding.[379] However, when they are incorporated in national laws they can obtain formal legal validity and become factually compulsory.[380] It is also argued that standards are actually generally binding public regulation as they satisfy the requirements of what constitutes generally binding public regulation.[381] First, they work externally because standards are applicable to parties that did not set the standard itself. Second, they are of a general scope because everyone needs to abide by them. Third, it could be argued that because legislators refer to them, they are approved and thus validated by a governmental authority.

There are three different ways in which statutes refer to standards.[382] The first is the rigid reference, when the law refers to a specific version of a standard. The second is a dynamic reference, when the standard number or title is given but the version is not mentioned. Finally, open clauses make general reference to standards without specifying a title or version. An example of such an open reference is art. 3 of the Dutch Commodities Act Decree on electro-technical products regarding (Warenwetbesluit elektrotechnische producten), which refers to "applicable safety regulation" from the IEC. Recently the judiciary has ruled on the question of the legal status of standards as well. The ECJ Fra.bo SpA case concerned the question if the ESOs are public or private entities.[383] The Dutch Knooble case raised the question of whether one can obtain copyrights on standards. In answering this question the court also explained the legal status of standards.[384]

We will discuss both cases in this section because it is a highly important question when one realizes that the standards referred to in legislation can be European standards, transferred into national standards. If these standards are considered as law, there is a necessity for procedural safeguards in the process of their development. However, procedural safeguards cannot be applied to

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[379] E.g. Joerges, C. & Micklitz, H.W. (2010) The need to supplement the new approach to technical harmonization and standards by a coherent European product safety policy, *HanseLR,* 6(2), p. 363, or Hahn, R. & Weidtmann, C. (2012) Transnational Governance, Deliberative Democracy, and the Legitimacy of ISO 26000: Analyzing the Case of a Global Multi-Stakeholder Process, *Business & Society,* 20(10), p. 3.

[380] Stuurman, C. (1995) *Technische Normen en het Recht*, (Dissertation) VU University Amsterdam, p. 202.

[381] E.g. Elferink, M. (1998) *Verwijzingen in wetgeving: Over de publiekrechtelijke en auteursrechtelijke status van normalisatienormen*, (Dissertation) Leiden University, p.65-66.

[382] Stuurman, C. (1995) *Technische Normen en het Recht*, (Dissertation) VU University Amsterdam, p. 148-150, adittioally standard scan also be incorporated word for word, se e.g. Blind, K. (2004) *The Economics of Standards, Theory, Evidence, Policy*, Cheltenham: Edward Elgar Publishing, p.72

[383] Case C-171/11, Fra.bo SpA v. Deutsche Vereinigung des Gas- und Wasserfaches, ECLI:EU:C:2012:453.

[384] Dutch Supreme Court, Knooble B.V, ECLI:NL:HR:2012:BW0393.

standardization in retrospect, as the standards already have been set. This is true for smart grids standards as well. As potentially smart grid standards will be incorporated in national law, we need to assess the consequences of this situation as well.

5.7.2 The case of Knooble

In this subsection we will discuss the Knooble case and compare it with similar national cases.

In the Knooble (Bouwbesluit 2003) case, the Dutch Supreme Court (Hoge Raad) decided that standards do not constitute generally binding public regulation yet are generally binding.[385] It was already established that standards cannot be considered generally binding public regulation, but this is the first time it was decided that they are generally binding.

The case concerned the company Knooble, which intended to publish relevant standards developed by the Dutch NSB on their website free of charge. These standards were referred to in a Royal Decree stating building requirements. Because the NSB depended on incomes through the sale of standards to make up for the costs of development, free distribution of standards would be detrimental for their business model. This prompted the question of what the legal status of such standards is. If the standards in the decree are considered as "generally binding public regulation", and therefore law, it would mean that they needed to comply with procedural requirements for legislation. One of these requirements is that they should be published following the *Publication Act (PA, Bekendmakingswet)*. Moreover, if the standards should be considered as public regulation, art. 11 of the *Copyright Act (CA, Auteurswet)* would exempt the standard from copyright, allowing Knooble to publish the standards.

The Building Decree refers to almost 70 Dutch official standards directly. They are dynamic references because they mention only the number of the standard. The standards, for example, influence the process of granting building permits. In order to obtain a permit, one has to comply with the relevant standard. The legal basis for referring to standards in this decree lies in article 3 of the Housing Act (Woningwet), which states that references to standards can be made through an Order in Council. One has to comply with these standards, but their use is not compulsory. One may demonstrate compliance with the Building Decree without referring to the standard, provided that the result is equivalent to the standard. Nonetheless, it remains questionable how one should know whether the result is

[385] Dutch Supreme Court, Knooble B.V, ECLI:NL:HR:2012:BW0393.

equivalent without accessing the standard.[386] In general, it is necessary obtain access to a standard in order to be informed what the requirements of the legislator are.[387]

At first instance, the District Court of The Hague decided that because the standards were not published according to the Publication Act, they were not generally binding public regulation and therefore the exemption of art. 11 CA did not apply. However, declaring that the standards in the Building Decree were not generally binding would imply that they do not have to be observed in construction work.

On appeal, the Supreme Court decided that even though standards cannot be considered "generally binding public regulation" and thus legislation, they are still generally binding and therefore can be enforced. It ruled in line with the decision of the Council of State concerning the legal status of standards.[388] The Council of State used the following reasoning: in the Explanatory Memorandum of the Housing Act it appears that the Dutch NSB, the NEN we discussed in Chapter 2, has no legislative powers and is not a body authorized to make "generally binding public regulation" and therefore their standards cannot be regarded as such. Nonetheless, the Explanatory Memorandum of the Publication Act also mentions that standards can become part of the law, which should be published and available to stakeholders.[389] Referring to the location where the standard can be found is enough to comply with the requirement of availability. Consequently this decision means that the standards are not "generally binding public regulation", and therefore do not have to comply with the rules of legislative procedure, including publication, yet they are binding for the public wishing to comply with the Building Decree.

The Knooble case was the first case in which the court also addressed the question of whether standards are generally binding. Later, a similar case came before the Trade and Industry Appeals Tribunal (College van Beroep voor het bedrijfsleven).[390] The plaintiff appealed a decision of the Ministry of Economics denying an energy investment deduction (energie-investeringsaftrek) because a heat pump did not comply with the relevant official standard. The plaintiff argued that the NEN standard was not publicly available because of the high price of € 287,60 and therefore in violation of the Publication Act. The Tribunal, however, decided in line with the Knooble case that the standard is not a

[386] Van Gestel, R. (2012) Hode Raad is duur, *RegelMaat*, 27(4), p. 253.
[387] Stuurman, C. (2009) annotation case Knooble/Staat en NNI, *AMI/Tijdschrift voor auteurs-, media en informatierecht*, 2, p.74.
[388] Council of State, City Crash, 2 February 2011, ECLI:NL:RBSHE:2010:BL3758.
[389] *Kamerstukken II*, 1985/86 19583, no. 3, p. 5.
[390] CBB, Alfa Subsidieadviseurs, ECLI:NL:CBB:2012:BW2468.

generally binding public regulation because the NEN is a private organization without rulemaking powers. Furthermore, because the standard works externally and binds citizens, they need to be publicly accessible; however, according to the Tribunal the price of € 287,60 did not create a barrier to access because the plaintiff was an enterprise.

The two Dutch cases are in line with what we established in the previous chapter: standards are not law because the standardization bodies are not a public authority with rulemaking powers.
Should these courts have found that the standards were actually "generally binding public regulation", the standardization bodies would have to be attributed rulemaking powers. That would subsequently lead to the bodies having to observe general principles of regulation, such as the principle that rules must be generated in the general interest, taking into account the principle of legal equality, and the rule of participation.[391]
Interestingly, a U.S. Court of Appeals for the Fifth Circuit case dealt with a very similar case.[392] In that case the two Texas towns of Anna and Savoy referred to the Standard Building Code, that was set by the private standard setter Southern Building Code Congress International (SBCCI). Mr. Veeck decided to publish parts of this Building Code on his website. In response, the SBCCI demanded he cease and desist from infringing its copyright to the standard. In direct contrast to the Dutch court, the Court of Appeals reached the decision that because the Anna and Savoy's building codes referred to the standard they become part of the law and the standards enter the public domain and no copyright is applicable. A comparable decision was made in a German case. Here, the Bundesverfassungsgericht developed the requirement for standards to be exempted from copyright that the legislator internalizes the standard by reference, or "sich-inhaltlich-zu-eigen-machen".[393]
Despite the decision in the Knooble case, the stance of the Dutch government that reference to where a standard can be found suffices seems to be shifting. Two healthcare standards (NEN 7510 and NEN 7513) concerning privacy protection were redeemed by the government and made publically available. It is promised to be the first of several standards that are referred to in regulation, to

[391] Stuurman, C. (1995) *Technische Normen en het Recht*, (Dissertation) VU University Amsterdam, p. 162-186.
[392] United States Court of Appeals, Veeck vs SBCCI, 99-40632, June 7 2002.
[393] Elferink, M. (2007) Auteursrecht op normalisatie-normen revisited, In: Visser, D. & Verkade, D. (eds.) *Een eigen oorspronkelijk karakter,* Amsterdam: DeLex, p.85.

be made publically available.[394] This is in line with its policy to make mandatory standards publically available "in resemblance to regular legislation".[395]

5.7.3 Fra.bo SpA v. Deutsche Vereinigung des Gas- und Wasserfaches

In the Fra.bo case, a German standard for copper fittings set by a private standardization body, Deutsche Vereinigung des Gas- und Wasserfaches (DVWG), created a barrier to trade for an Italian producer of copper fittings. German regulation stated that the fittings should comply with the recognized rules of technology, which in fact meant compliance with the German standard. The reference was an open reference because it only mentioned DVWG standards in general but no specific type or title. This is the first case in which the ECJ had to decide on a matter of presumption of conformity of national law on the grounds of standards. The concerning standard required fittings to withstand 3000 hours of 110 degree boiling water. The compliance was tested by DVWG as well, which in turn established that the copper fittings did not comply with the German standard, whereas the fitting did in fact comply with Italian standards. Although refusal of certification did not mean that the fitting was not permitted to be sold in Germany, in practice, almost all consumers bought certified fittings: thus, selling it was almost impossible without being certified. Not being certified created a considerable restriction on the marketing of the product.[396]

The question at hand was whether this constituted a measure of equivalent effect as in article 34 TFEU. This provision creates an obligation for Member States, and not for non-state actors. In Germany, the standardization and certification bodies are not public authorities: thus, the obligation would not be applicable. However, that creates the possibility for Member States to circumvent the provision by assigning the task of standardization to private standardization bodies. Moreover, it creates different treatment under law because in certain countries, standardization is a public task.[397] The ECJ decided that the activities of this combined standardization and certification body in reality created the power to regulate entry into the German market of products. "[I]t is clear that a body such as the DVGW, by virtue of its authority to certify the products, in reality holds the power to regulate the entry into the German market of

[394] *Kamerstukken II*, 2014/15, 33509, no. 38, p. 4-5.
[395] *Kamerstukken II*, 2010/11, 27406, no. 193, p. 2.
[396] Case C-171/11, Fra.bo SpA v. Deutsche Vereinigung des Gas- und Wasserfaches, ECLI:EU:C:2012:453.
[397] Van Gestel, R., & Micklitz, H. (2013) European integration through standardization: how judicial review is breaking down the club house of private standardization bodies, *Common market law review*, 50(1), p. 159.

products...". [398] The standard therefore gave rise to restrictions on the free movement of goods in the same manner as measures imposed by the state.

This decision implies that a standardization organization can execute a public task while maintaining the status of a private organization. Considering that article 34 TFEU applies in the same way to the EU institutions as it applies to Member States, the European New Approach standards appear to have become subject to judicial review.[399] After all, this is a similar system of standardization as the German case. The New Approach directive refers to the standards that are subsequently set by the standardization organizations. This ruling undermines the starting point of the New Regulation on Standardisation that compliance with standards is voluntary. The judgment clearly states that standardization bodies can hold the power to regulate the entry to the market. Nonetheless, the case does not provide a conclusive answer to question if standardization bodies as such can be regarded as public authorities because in this case, the standardization body was also in charge of certification.

5.7.4 Analysis

We saw that the one objection to "code is law" that did not change in the case of standards was that standards are not developed by a recognized public authority. In the Dutch case, this was exactly the reason to not classify standards as law. In the end, the courts' argument boils down to the statement that the NEN can set conditions for building requirements, yet because they do not have the formal power to set these conditions, they do not need to comply with the formal rules of publication. In contrast, everyone wanting to comply with the Building Decree needs to comply with the standards, and they are therefore generally binding. This seems like a worrisome ruling, especially when observing the role of standards in current society. Because standards are not developed by a recognized public authority, the process does not take into account the procedural safeguards of rulemaking, such as transparency, a fair balance of interests, participation and publication. Moreover, the standardization organizations are not accountable for their activities in any way. Not being developed by a recognized public authority is precisely the reason the court gives for why they are not considered law and therefore do not need to comply with those safeguards. Nonetheless, it does not change the fact that they are generally

[398] § 31 Case C-171/11, Fra.bo SpA v. Deutsche Vereinigung des Gas- und Wasserfaches, ECLI:EU:C:2012:453.
[399] Schepel, H. (2013) The New Approach to the New Approach: The Juridification of Harmonized Standards in EU Law, *Maastricht Journal of European and Comparative Law*, 12(4), p. 528.

binding. In addition, several new questions arise through this decision. For one, it remains unclear on what basis the standards become generally binding. It can be argued that, instead of just accepting any given standard up front, the government has a duty to monitor the process and the standard itself in these cases.[400] Furthermore, the question of why certain rules that bind citizens do not have to be made publicly available remains unanswered.[401] One can hardly imagine that the Council of State sought to make the standards generally binding without them somehow becoming part of the law. Although this decision ensures that the NSB is not suddenly left without revenues, it does not answer the question of what the legal status of standards is.

The ECJ provides a slightly different perspective on the view that standard bodies are not equal to a recognized public authority. It ruled that in reality, the standardization body DVWG holds the power to regulate the market in a manner equivalent to the power of the Member State. Therefore, standardization bodies may not be a recognized public authority but they can be regarded as equal. As in this case, the standardization body was responsible for setting the standards as well as certification; the question remains whether a standardization organization in itself can also be regarded as an authority that is able to regulate the market.

Both cases, nonetheless, reinforce the theory that standards can regulate: in the Dutch case because they can be generally binding and in the EU case because standardization bodies can hold the power to regulate the market.

On an EU level, standards are often distinguished from regulation because they are voluntary and therefore exempted from procedural safeguards. When standards become mandatory on a national level, however, it raises the question of whether the reasons for not providing procedural safeguards can hold up to scrutiny. As described in Chapter 3, European standards find their way into national law, through the mandatory transfer of European standards to national standards. This is a possible future for smart grid standards as well.

Thus, it is not set in stone that standardization bodies cannot be regarded as a recognized public authority. Both the national and EU cases do not give a conclusive answer as to what the legal status of a standard is. They can be legally binding, or have legal effects, and the standardization bodies can be regarded as a body holding the power to regulate. The only objection to "code is law" that was

[400] Van Gestel, R. (2012) Hoge Raad is duur, over het verwijzen naar normalisatie normen in wetgeving, *RegelMaat*, 4(27), p. 251.

[401] AB 2012/228: Verwijzing in wetgeving naar NEN-normen. Geen algemeen verbindende voorschriften. Publiekrechtelijk algemeen geldende normen, annotation F. Van Ommeren.

not rebutted in the manifestation of standards was that the standardization bodies are not a recognized authority. With the ECJ case, even this last objection is called into question.

5.8 Conclusion

In this chapter we addressed subquestion 3 of what the legal status of standards is. We saw that code regulates individuals in different ways. The example of Facebook newsfeeds indicated that code could even regulate users' way of expressing themselves. The choices made in code are predominantly made by industry based on commercial interests. The approach that developing code requires including safeguarding for certain values for society is a crucial lesson to take from the theory of "code is law".

Certainly, there are different grounds to call the theory into question. However, when standards are viewed as a genus of code, the only major objection to viewing them as law is that they are not developed by a recognized public authority. The ECJ Fra.bo case showed that the regulating power of standardization bodies can be viewed as being equal to that of a recognized authority, the state. The Dutch Courts also identify that standards have the power to be generally binding, yet refuses to accept that they can be regarded as law in the case that they are referred to in legislation. Their reasoning is that they do not comply with the requirement of being developed by a recognized public authority. Nonetheless, the consequences of this narrow interpretation of standards are important. It entails that no procedural requirements are necessary in developing the standard. The fact that there is even a possibility that smart grid policy aims and requirements are not sufficiently taken into account is actually caused by the fact that standardization bodies are not public authorities. If they were, they would have to abide by general principles of regulation that are, amongst others, intended to take these aims and requirements into account.

The chapter thus showed that standards have a great capacity to regulate, the standardization organizations can, in circumstances, have regulating power equal to the state, and finally when referred to in legal acts they can become generally binding. All, without any way to ensure that public interests are not harmed or safeguards in of participation, openness or accountability, as is required of public authorities creating such rules. The answer to the third subquestion is that standards are not law in a strict sense, yet in effect they are equally binding to law. We do not suggest that the ESOs need to become an official EU institution.

However, in the absence of a sufficient framework, there is a necessity for additional safeguards.

6 Safeguarding smart grids policy aims & requirements

In this chapter, we discuss subquestion SQ4 about whether policy aims and requirements are sufficiently safeguarded through smart grid standardization. We discuss the requirements that need to be incorporated in the standardization mandate to ensure that standards do not impair policy aims and requirements for smart grids. We will discuss the principles of good governance, which can provide procedural safeguards to ensure optimal inclusion of the requirements set in the mandate and to protect interests that could not be anticipated.

6.1 Introduction

In this chapter we address the fourth subquestion of this research SQ4: Are policy aims and requirements sufficiently secured by the current legal and regulatory system of standardization? This subquestion is the final step in answering the main research question: How can policy aims and requirements be safeguarded in the technical standardization of smart grids?
In the previous chapter, we examined the theory of "code is law", and we concluded that standards might not be considered law, but they come considerably closer to what can be considered law than code in general. European standardization has a strong emphasis on standards being voluntary. The recitals of the New Regulation on Standardization open by stating that standardization has as its objective to create *voluntary* specifications.[402] The definition of a standard in this regulation, again, encompasses an element of not being *compulsory*. [403] In the previous chapter, we established that standards are considerably more compulsory than the EU policy on standardization suggests, either because they become de facto binding through "code is law" or because they become legally binding when referred to in national legal acts. The necessity for procedural requirements, such as checks and balances, or, as Lessig describes it, a *constitution* for code development, to protect all relevant interests was expressed in the discussion about "code is law". Especially in an area as important as the EU energy system, it is crucial that these binding norms are developed in a way that considers policy aims and objectives.

In this chapter, we first examine which possible legal safeguards for protecting policy aims and requirements are currently part of the European standardization system. To understand how the current smart grid standardization process addresses the policy aims

[402] Recital 1 of the New Regulation on European Standardisation no. 1025/2012, OJ 2012 L 316.
[403] Ibid. art. 2 §1.

and requirements we will review the approach for smart grid standardization within the ESOs. We will see that neither the legal framework nor the practice of standardization itself adequately considers the policy aims and requirements. Finally, we will discuss two ways in which policy aims and requirements can indeed be safeguarded.

6.2 Current situation of the legal protection of smart grid aims and requirements in standardization

There are three mechanisms in the New Regulation that provide an opportunity to incorporate interests other than those already represented by industry experts, which potentially safeguards smart grid policy aims and requirements. These mechanisms are the public enquiry phase, the inclusion of societal stakeholders and SMEs, and the opportunity to make formal objections.

Industry representatives participate in the standardization process as members of the technical committees, while the ESOs facilitate process. By participating in the standardization process these representatives have a chance to influence the outcome of the standard in a way that benefits the interests of the party they represent. They are tasked with pursuing their employers' interests in the standard.[404] In Chapter 3, we discussed that companies can include standard essential patents in the standard. After the standard is accepted, they claim royalties. In and of themselves these companies have no obligation to consider any other interests, such as the policy aims and objectives of the EU for smart grids.[405] In the current legal system of standardization there are three mechanisms that could provide a means to safeguard interests that are not represented by commercial parties (although not all three mechanisms are intended to provide such a safeguard). The first mechanism is process' public consultation phase in the ESOs, in which the public can comment on the draft standard. Second, official societal stakeholders have a special position in the standardization process, which is regulated by the New Regulation on Standardization. The third possibility involves the procedure for formal objections by the European parliament or Member States. In this section, we will review whether these mechanisms provide a sufficient safeguard for smart grid policy aims and requirements .

[404] It is discussed whether they, on occasion, act in line with their personal motivation, or role in the committee instead of the interests of their employer, yet that is a different discussion. E.g. Biddle, B., et al. (2011) The Expanding Role and Importance of Standards in the Information and Communications Technology Industry, *Jurimetrics*, 52.

[405] This is, of course, different in the case of New Approach standards.

6.2.1 The public enquiry phase

Article 4 of the New Regulation on European Standardisation addresses the transparency of the European standardization process. It requires the ESOs to send at least an electronic form of any draft standard upon request of another ESO, a NSB, or the Commission.

The NSBs should publish the draft standards, which provides an opportunity for other stakeholders to respond. However, stakeholders need to keep track of the progress of the standardization process. Some NSBs might actively distribute the drafts; however, this is often only done for the parties that are already involved in the process on a national level.[406] Depending on the policy of the NSB, NSB members or non-members can access these draft standards. Article 6 of the New Regulation demands that NSBs stimulate the participation of SMEs in the process by, for example, giving SMEs access to the process without requiring membership and making draft standards publically available, free of charge or at reduced rates. However, the NSB's process of publishing draft standards is not harmonized. Different NSBs publish diverse draft standards, and not all of them provide access free of charge. In the case that an interested party finds a relevant draft standard free of charge or can afford to pay the fee, the party can communicate its comments to the NSB. to the NSB subsequently formulates a national viewpoint that includes the comments it received. Public authorities can also use this phase to provide input, and they sometimes do so.[407]

At this point in the process, stakeholders are able to comment on the draft standard, which provides an important opportunity for parties to deliver input. in terms of aims and requirements, this phase could be used by consumer protection or environmental protection organizations to address issues related to consumer protection or carbon emission reduction. However, access to the documents is quite obstructed: it is not necessarily true that "the public" in general can access the documents when they are not made available by the NSBs, or if access induces high costs. Especially when the drafts are only distributed to parties that are already involved in the process, the process will

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[406] Van Elk, K., & van der Horst, R. (2009) *Access to Standardization–Study for the European Commission,* Study for the European Commission, Enterprise and Industry Directorate-General, Zoetermeer, p. 59, retrieved on 3 October 2014: http://ec.europa.eu/enterprise/policies/european-standards/files/standards_policy/access_to_standardisation/doc/access_to_standardisation_study_eim_en.pdf.

[407] Van Elk, K., & van der Horst, R. (2009) *Access to Standardization–Study for the European Commission,* Study for the European Commission, Enterprise and Industry Directorate-General, Zoetermeer, p. 125, retrieved on 3 October 2014: http://ec.europa.eu/enterprise/policies/european-standards/files/standards_policy/access_to_standardisation/doc/access_to_standardisation_study_eim_en.pdf.It states that consumer oganizations, environmental organizations and public authorities had respectively participated in public enquiry 36, 114 and 14 times of average in the last 5 years. Considering that the national standardization body such as the Dutch NSB deals with ±3300 standards and publishes ±1100 standards yearly, these are quite low numbers.

unlikely provide any new input as these parties already provided their input at en earlier stage.

Article 4 §2 requires that the ESOs duly consider the comments of the other ESOs, Commission and NSBs and reply to them. However, what this reply comprises is unclear. CEN/CENELEC policy does not describe it; ETSI policy states that ETSI makes a compilation of all of the comments that are received available for the NSBs.[408]

6.2.2 The inclusion of societal stakeholders

The second possibility is the inclusion of societal stakeholders of European standardization. These societal stakeholders are ANEC (consumers), ECOS (environment), ETUI (trade unions) and SME representatives discussed in Chapter 3. Representation through societal stakeholders may contribute to the inclusion of policy aims and requirements in smart grid standardization because the areas that these societal stakeholders cover are related to them. ANEC can represent the consumer interests in smart grids; ECOS can address the carbon emission reduction aims;[409] and a strong position for SMEs indirectly supports the functioning of the energy market[410].

The introduction of the New Regulation has improved the position of societal stakeholders. Article 5 §1 of the New Regulation states that the ESOs need to encourage societal stakeholders' participation in standardization from the early stages of policy development throughout the standardization process. Article 5 §2 continues by requiring the ESOs to encourage the representation of "under takings, research centres, universities and other legal entities" if they participate in a EU funded related project. In addition to the policy about inclusion of the SMEs in the ESOs, art. 6 regulates the participation of SMEs in the NSBs. The inclusion of SMEs is crucial in ensuring that they do not suffer disproportionate adverse effects from standards.

Societal stakeholders can provide input related to consumer interests. In this case ANEC has quite an important task. As we saw, there are numerous consumer interests at stake. The transparency of billing, reasonable pricing, the protection of the vulnerable customer, access to services, not to mention privacy protection, are all in the hands of ANEC.[411] As we observed in the previous chapter, the consequences for end-users of

[408] ETSI Directives v. 32 October 2013, §2.2.1.1.1, retrieved 6 January 2015: https://portal.etsi.org/directives/32_directives_oct_2013r.pdf.

[409] Reducing carbon emissions to address climate change is one of the priorities for ECOS, retrieved on 17 November 2015: http://www.ecostandard.org/?category_name=activities-climate

[410] Additionally, they potentially also contribute to carbon emission reduction in the electricity system through developing resource efficient technology, Commission Decision Horizon 2020 Work Programme 2014-2015, Secure clean and efficient energy revised, C(2014)4995.

[411] In relation to the vulnerable customer, CEN and CENELEC procedure partly provide some protection, namely in the case of disabled and elderly persons, Guide 6 CEN CENELE Guidelines for standards developers

technology can be vast. The lack of sufficient representation of user interests as a counterbalance of the technical nature of the process is not a new issue.[412] The same is true in relation to carbon emission reduction for ECOS. The participation of SMEs can benefit the functioning of the market in the sense that more companies can access the market. Participation can help these companies to not lag behind due to lack of knowledge of the content of the standard, as was the case in the X/Open Group case in Chapter 3.

It is questionable whether these measures actually provide sufficient leverage for societal stakeholders to influence the outcome in a way that benefits the smart grid policy aims and requirements. For one, even though article 5 encourages representation and participation, the societal stakeholders share one important disadvantage, unlike the members of the standardization process: they are not allowed to vote in CEN and CENELEC. Such voting rights are not required according to recital 23 of the New Regulation. National representation in CEN and CENELEC only allows for NSB representatives to vote, and societal stakeholders are thus excluded from voting. Their role in the process extends to a liaison position which means that they can comment in all stages of the process. Therefore, the societal stakeholders may have an influence, but they cannot cast a vote and can only provide comments during the process. In contrast, in ETSI the societal stakeholders do have a vote, but their vote has little influence, as ETSI has over 750 members only a few of which are societal stakeholders.[413]
Moreover, societal stakeholders and SMEs do not have the means to participate in every meeting for every standard, no matter which ESO facilitates the process. Volunteer experts, able to represent the interests of societal stakeholders in standardization, are few and far between in most countries. According to an interview conducted in this research with the Secretary General of ANEC the European associations that represent these stakeholders need to cherry pick the experts who are available—through tier national partners, such as national consumer associations—and bring them together at the European level to determine positions in the collective interest of that stakeholder community.[414] In addition, these experts are more similar to informed laymen compared

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to address the needs of older persons and persons with disabilities Edition 1, January 2002, retrieved on 1 December 2014: ftp://ftp.cencenelec.eu/EN/EuropeanStandardization/Guides/6_CENCLCGuide6.pdf.
[412] E.g. Stuurman, C. (1992) Legal aspects of standardization of information technology and telecommunications: an overview, *Computer Law & Security Review,* 8(1), p. 8.
[413] A list of current members can be found on http://www.etsi.org/membership/current-members, retrieved 5 January 2015.
[414] The way this process for volunteer experts works was explained in an interview with ANEC Secretary-General Stephen Russel on 19 October 2012, transcripts are documented.

to the technical expertise that market parties can often bring to the process.[415] Multi-nationals specialize in a certain product area and are able to choose from a multitude of experts on a specific product, who have the best knowledge on the aspect of the standard. Societal stakeholders, on the other hand, must rely on whoever is willing to participate voluntarily.

In addition, the process is very complex due to different formal and informal meetings; consequently, these parties often have insufficient access to all of the meetings and the details of the sessions.[416]

Encouraging the participation of SMEs at the NSBs does not necessarily ensure that they will also be represented in the ESO standardization process. Participation on EU level is much more intensive, as it takes place in Brussels and it will thus cost additional time and extra travel expenses in most cases. As the SMEs have fewer resources than large companies, this additional expense might be an obstacle to participatin in the EU process.

A section in the smart grid standardization mandate concerns the organizations to be involved. The mandate requests that ESOs ensure that the relevant actors are involved in the process. The official societal stakeholders are referred to explicitly. However, the mandate does not clarify what type of actors the other relevant stakeholders could be.

In addition to the participation of societal stakeholders, the inclusion of research institutes and universities in art. 5 §2 can also provide important input for smart grid standardization. The condition of participating in relevant EU-funded projects is met in smart grid standardization as research institutes and universities are involved in framework programs and Horizon 2020 projects that are funded by the EU that relate to smart grids. To the extent that they do not participate with the purpose of including their patents in the standard, researchers are likely to be more neutral parties than the commercial parties. In the smart meter case discussed in Chapter 2, for instance, a research organization addressed the issue that not including a display in the standard would mean that the smart meter would not realize any more energy efficiency than the traditional meter.

6.2.3 Formal objections

The third possibility to incorporate interests of different parties is that of the procedure of formal objections, which was briefly addressed in Chapter 3.

Article 11 states:

[415] Joerges, C. & Micklitz, H. (2010) The need to supplement the new approach to technical harmonization and standards by a coherent European product safety policy, *HanseLR,* 6(2), p.368.

[416] Kica, E., & Bowman, D. (2013). Transnational Governance Arrangements: Legitimate Alternatives to Regulating Nanotechnologies?, *NanoEthics*, 7(1), p.77.

> "When a Member State or the European Parliament considers that a harmonised standard does not entirely satisfy the requirements which it aims to cover and which are set out in the relevant Union harmonisation legislation, it shall inform the Commission thereof".

The objection is aimed at evoking a Commission Decision to prevent the publication, or removing a standard from the Official Journal. In turn, the Commission needs to make a decision based on the comitology examination procedure art. 5 of Regulation 182/2011 discussed in Chapter 3 to (partly) not publish or remove the standard from the OJ. Although this procedure is important, if not the most important, way to safeguard relevant policy aims, it is not useful for smart grid standardization at this point, as it does not pertain to this situation. The phrase "which are set out in the relevant Union harmonisation legislation" indicates that the objections can only relate to legislation that is relevant to the standard. Smart grid standards are solely based on a standardization mandate, and have no accompanying New Approach Directive to review compliance. It is therefore quite unlikely that any formal objections will be made. In any case, none has yet been made with regards to non-New Approach standards. Moreover, the EU guides regarding standardization suggest that the objection's purpose is to prevent or remove the presumption of conformity with the relevant New Approach Directive.[417]
Conversely, in case the phrase "relevant Union harmonisation legislation" is interpreted to include other legislation, this procedure could provide a powerful safeguard for the policy aims and requirements. In that case, the standard could be assessed in relation to the functioning of the market, energy efficiency and developing renewable energy (as in article 194 TFEU), and the protection of the consumer of the electricity directives. Moreover, the standard could be evaluated against all relevant data protection legislation, perhaps even going so far as to assess its compliance with the standardization mandate. We will discuss the latter situation in the course of this chapter.

6.3 Smart grid standardization in practice

Even though the previous section paints a grim picture for the current safeguarding of policy aims and requirements, they might actually be safeguarded in practice. Therefore, we review the process of smart grid standardization within the ESOs to ascertain to what

[417] Guide on the implementation of EU product rules, European Commission 2014, p. 38 retrieved on 25 March 2014: http://ec.europa.eu/enterprise/policies/single-market-goods/files/blue-guide/guidepublic_en.pdf.

extent these aims and requirements are considered in the process. We will not examine to what extent the separate aims and requirements are covered in the standardization process, but we will review whether the standardization approach considers them.[418] For this review, we examine the published standardization work of the four officially established working groups that are part of the Smart Grid Coordination Group (SG-CG). By no means does this cover all the actual work that is done by the smart grid standardization groups, since not all meetings and discussions are recorded and published. Therefore, we will be unable to establish with certainty whether or not these aims and requirements have been discussed at any point in the process. We can only draw conclusions based on what is published. On the basis of the mandate for CEN/CENELEC and ETSI the SG-CG was established with four different focus areas, each with separate deliverables. These are the following:

- Smart Grid Reference Architecture
- First Set of Standards
- Sustainable Process
- Smart Grid Information Security

After finishing their reports in the end of 2012, four succeeding groups were established. These are currently working under new names:

- Standardization Gaps Prioritization
- Methodology and New Applications
- Interoperability
- Information Security[419]

These groups are not standardization bodies as in a Technical Committee, yet they coordinate and steer the work under M/490.[420]

The deliverable of the first set of standards defined which relevant European standards were available, which relevant international standards were available, and which ones were lacking.[421] The report mentions the requirements of the Smart Grids Task Force, in its footnote at the beginning of the report.

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[418] This research, just as the Commission, has some limits as to the technical detail in which can be studied.
[419] Reports from the separate groups can be found on http://www.cencenelec.eu/standards/Sectors/SustainableEnergy/SmartGrids/Pages/default.aspx, retrieved 5 January 2015.
[420] Ulsar, M. (2013) Introduction and Smart Grid Basics, in: Ulsar et al. (eds.) *Standardization in Smart Grids*, Heidelberg: Springer, p. 9.
[421] Report from the CEN-CENELEC-ETSI Smart Grid Coordination Group: First Set of Standards, retrieved on 27 march 2014: http://ec.europa.eu/energy/gas_electricity/smartgrids/doc/xpert_group1_first_set_of_standards.pdf.

The way that the mandate's working groups approach smart grid standards is expressed in the Smart Grid Architecture Model (SGAM). This model depicts the different interoperability layers that are relevant for smart grid standards. We discuss this model because it provides insights into the way that the standardization process is approached.

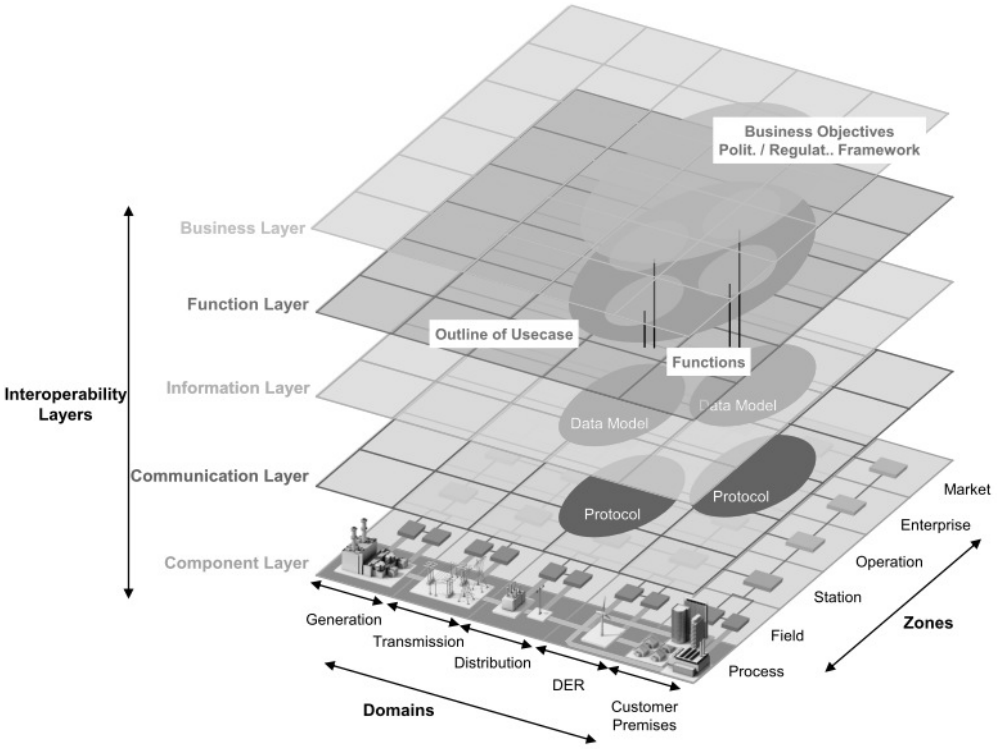

Figure 6.1: The SGAM framework[422]

The political and regulatory framework in SGAM is part of the business layer. The report Smart Grid Reference Architecture Group's discusses what the layer comprises.[423] It focuses on business functions and describes their (possible) roles in the smart grid. With respect to regulation and legislation it focuses solely on market regulation. In this part there is no mention of the EU policy objectives for smart grids. Nonetheless, a separate working group addresses data protection. The Smart Grid Information Security Group

[422] Report from the CEN-CENELEC-ETSI Smart Grid Coordination Group: Smart Grid Reference Architecture, November 2012, p.30, retrieved on 6 January 2015: http://ec.europa.eu/energy/gas_electricity/smartgrids/doc/xpert_group1_reference_architecture.pdf.
[423] Ibid., p. 38-42.

specifically addresses user privacy, data protection, and relevant legislation. This aspect of consumer protection thus seems to be sufficiently addressed.
The standardization work primarily addresses three lower layers.[424] The lower layers inherently influence the business layer according to "code is law". Technology shapes the possibilities and restrictions of the smart grid. Thus, instead of starting at the business layer in which the aforementioned smart grid policy objectives are embedded, and using this layer as a reference for the other layers, the standardization work focuses on the separate lower layers and thus determines the outcome of the business layer through standardization. Therefore, the lower layers shape the top layer, instead of the other way around.

As is apparent in the SGAM diagram, the smart grid is a complex system with several different aspects, roles and possibilities. Therefore, the range of standardization is very wide. For example, with regards to ICT semantic standards, the IEC and SG-CG deem the Common Information Model (CIM) to be a relevant model.[425] This model connects different elements for communication in the grid. For example, it can organize energy sources, connectivity nodes and conductors in a common communication framework. Currently, ENTSO-E creates CIM profiles for its members. Future CIM extensions could include weather data and electric vehicles.[426] Other standards cover different areas such as grid- and information security, hardware-related standards such as substation automation and distributed energy resources, and market operation.
The updated smart grid set of standards contains a system-by-system mapping of the standards on SGAM. In these mappings the only three layers that are addressed are the lower three.[427] These systems include, for example, substation automation, blackout prevention and clock reference. In these areas smart grid policy aims and requirements will play an indirect role. However, the systems also address the market place and trading systems. In the SGAM reasoning of focusing on the lower three layers in these systems will entail that crucial smart grid requirements, such as the protection of the vulnerable customer, access to services and transparency of billing, are not taken into account in the

[424] Report from the CEN-CENELEC-ETSI Smart Grid Coordination Group: First Set of Standards, retrieved on 27 march 2014:
http://ec.europa.eu/energy/gas_electricity/smartgrids/doc/xpert_group1_first_set_of_standards.pdf.
[425] Intermediate Report of the Working Group Interoperability to the Smart Grid Coordination Group / Mandate M/490, p. 72 (retrieved on request to the NEN) and Specht, M. & Rohjans, S. (2013) ICT and Energy Supply: IEC 61970/61968 Common Information Model in: Ulsar et al. (eds.) *Standardization in Smart Grids*, Heidelberg: Springer.
[426] Specht, M. & Rohjans, S., ICT and Energy Supply: IEC 61970/61968 Common Information Model in: Ulsar et al. (eds.) *Standardization in Smart Grids*, Heidelberg: Springer, p. 113.
[427] Report from the CEN-CENELEC-ETSI Smart Grid Coordination Group: Smart Grid Set of Standards version 3.1, retrieved on 14 March 2015:
ftp://ftp.cencenelec.eu/EN/EuropeanStandardization/HotTopics/SmartGrids/SGCG_Standards_Report.pdf.

standardization of these technologies, while they are key elements in designing the market place and trading systems.

Smart grid standards are developed in the ESOs, and of course developed on an international level as well. The SG-CG attempts to standardize in line with IEC smart grid standards. An example of a successful exchange of information in the standardization bodies was when the Sustainable Process group further developed the IEC/PAS 62559 template for European standardization.[428] There are also fora and consortia involved in smart grid standardization. OASIS, for example, is developing the Energy Market Information Exchange standard.[429] The IEEE develops several standards concerning, for example, time protocols.[430]

Vendors of communication and automation technologies dominate the process of smart grid standardization. However, utility-companies are crucial to provide solutions for smart grid standards. They are underrepresented in the process as most utility-companies are not prepared to pay for sending employees to participate in the standardization process.[431]

All in all, the process is oriented around the components and information communication technology itself, and fails to address the policy aims and most requirements of the EU, apart from privacy protection. Even so, the absence of these aims and requirements is not surprising. After all, these aims are not communicated as such to the ESOs. We will address this issue in the following section.

6.4 The standardization mandate as a legal framework

As mentioned in Chapter 3, the General Guidelines for Cooperation between the ESOs, the European Commission and the EFTA state the following:

> "[h]igh levels of environmental and consumer protection have become fundamental objectives under the EC Treaty. Subsequently, environmental and consumer considerations need to be systematically integrated into other policy

[428] Report from the CEN-CENELEC-ETSI Smart Grid Coordination Group: Sustainable Process, November 2012, p. 77, retrieved 6 January 2015: http://ec.europa.eu/energy/gas_electricity/smartgrids/doc/xpert_group1_sustainable_processes.pdf.

[429] Committee Specification retrieved on 6 January 2015: http://docs.oasis-open.org/emix/emix/v1.0/emix-v1.0.html.

[430] Smart grid related IEEE approved en proposed standards can be found on: http://smartgrid.ieee.org/standards/ieee-approved-proposed-standards-related-to-smart-grid, retrieved 6 January 2015.

[431] Ulsar, M (2013) Looking Aheead: The Future of Smart Grid Communications and Standardization, in: Ulsar et al. (eds.) *Standardization in Smart Grids*, Heidelberg: Springer p. 231.

areas and sectors of society. This development also concerns European standardisation."[432]

In addition, the recitals of the New Regulation on European Standardisation contains the following phrase:

> "[s]tandards can contribute to helping Union policy address the major societal challenges such as climate change, sustainable resource use, innovation, ageing population, integration of people with disabilities, consumer protection, workers' safety and working conditions."[433]

Where New Approach standards are concerned, these fundamental EU objectives and societal challenges are clearly set out in essential requirements. However, smart grids have no applicable New Approach directive. In this section, we will argue that including smart grid aims and requirements in the standardization mandate is necessary.

6.4.1 The practical side

We learned from the mistakes made in the Dutch smart meter case in Chapter 2 that it is necessary to determine minimum legal requirements to which the standards need to adhere. These requirements were amongst others: privacy protection, information on actual time of use and energy efficiency. As it turned out the codification of the requirements came too late both in the Dutch as well as in EU case.[434] In both cases, the minimal functionalities for the smart meter were laid down in law only years after the standardization request. Because these requirements came after the development of the first standards, the first standards do not comply with the legal requirements. If those legal requirements had been clearly determined up front, the problem that standards are not in line with legal requirement would not have occurred. Legal requirements are still not being determined up front. So the numerous meters that are currently being rolled out in Member States also do not comply with the requirements.

[432] General Guidelines for the Cooperation between CEN, CENELEC and ETSI and the European Commission and the European Free Trade Association, 28 March 2003, §5, OJ 2003 C 91, p. 8.
[433] Regulation No 1025/2012 on European standardization, OJ 2012 L316, p. 14.
[434] A study on the US CALEA standard correspondingly concludes that in order for a standard to comply with the governments aims, the requirements of the mandate needs to be crystal clear: Gidari, A. (2006) Designing the Right Wiretap Solution: Setting Standards under CALEA, *IEEE Security & Privacy*, 4(3).

6.4.2 The pitfall of this construction (back to Lessig)

The system of authorities requesting private parties to develop a standard is based on the assumption that technical details will not conflict with the technology's policy aims and requirements as technology is neutral and not normative. From the perspective of "code is law" we have observed that this property is a serious pitfall, as this assumption is flawed.

Standards can impact more than just the technical architecture. The current situation is such that if standards are to be developed in such a way that they comply with policy aims and requirements, it is up to technical experts in the standardization committees to take the initiative to make sure that the architecture of the standards does not interfere with policy aims and requirements.

In the case of New Approach standards, the policy requirements are quite extensively described in the accompanying directive. It is thus mostly ensured that policy aims and requirements are transferred into the standard. However, the case of smart grid standardization lacks such an accompanying New Approach directive. Therefore, the policy aims and requirements exist and are formulated, but they are not formally communicated to the ESOs. There is only the standardization mandate, which forms the sole legal requirement for the specific standardization process. In the absence of an accompanying directive, the policy aims and requirements must be addressed in the mandate itself.

6.4.3 The legal status of the standardization mandate

Finally, as discussed in Chapter 3, the changed status of the standardization mandate in the New Regulation calls for a new perspective on the requirements of the mandate. As a decision, is must be clear which requirements must be met to abide by the decision.

6.4.3.1 Requirements in the smart grid standardization mandate

The smart grid mandate does not provide binding requirements to which the standards need to comply, as only deadlines are meant to be binding.

In section 3.7 we discussed the standardization mandate for smart grids. Its objective is integrating digital computing and communication technologies and electrical architectures, and associated processes and services, that will achieve interoperability to facilitate the implementation Smart Grid deployment in Europe. It states a non-limitative lists of domains to cover, such as data modeling, description language, cyber security, data protection, and Information system management. The aims related to carbon emission reduction are only referred to as a background. It furthermore mentions three deliverables: A reference architecture, consistent standards, and a sustainable

process. These deliverables correspond with the first three working groups that we mentioned in section 6.3. The group of Information Security is added by the SG-CG. Finally, the mandate states the deadlines for the deliverables.
Privacy and security are quite elaborately addressed in the mandate. Furthermore, the SG-CG working group for information security also accurately addresses data protection in the standardization work.[435] This group describes the need to address privacy issues at the development stage to ensure that consumers are protected from data protection breaches. Moreover the group discusses the current and proposed EU regulatory framework on data protection extensively. In addition, it contains a comparative study on the regulatory framework for data protection and smart metering of five different member states. This thorough approach is of course highly commendable and probably an indication that addressing the policy requirements of privacy and security in the mandate had effect. It is obvious from the report that this standardization group took the effort to involve someone who is an expert in the legal field, as opposed to merely concentrating on technical issues. We can only draw tentative conclusions on this one instance of successfully addressing a policy requirement, but it seems that the emphasis of this one requirement of data protection in the mandate has worked out successfully.
Finally, on a less optimistic note, the standardization work does not address the other requirements for the consumer, such as the protection of the vulnerable customer.
Apart from data protection, the mandate formulates no requirements regarding other smart grid policy objectives and aims. Carbon emission reduction aims are only mentioned as part of the background, but this part does not provide any requirements for standardization. Therefore, apart from a clear data protection requirement, the mandate does not state any clear conditions for standardization that relate to smart grid policy aims and requirements.

6.4.3.2 Consequences of the New Regulation on Standardization for the smart grid standardization mandate

As we saw in § 3.7, as a decision, the mandate is binding in its entirety for the ESOs, and it needs to be viewed in light of concerning higher legislation.
The status of the mandate as a decision also invokes the Commission's responsibility to supervise the outcome of the standard. This invocation might explain why the New Regulation in art. 10 §6 states that the Commission will publish European standards in the Official Journal of the EU if "a harmonised standard satisfies the requirements which

[435] CEN-CENELEC-ETSI Smart Grid Coordination Group—Smart Grid Information Security, Intermediate-Report-V1, p. 60-79 retrieved on 19 November 2014:
http://www.energynetworks.org/modx/assets/files/electricity/engineering/Standards/SGCG%20Reports%20071014/SGCG_WGSGIS_Sec0078_INF_ReportforComments.pdf

it aims to cover and which are set out in the corresponding Union harmonisation legislation". In other words, the Commission is responsible for testing the standard's conformity with the aims and requirements.
In addition, in a broad interpretation of art. 11 of the New Regulation, one could argue that the formal objection of the Parliament and Member States could also be based on the mandate as a decision. This article relates to "harmonized union legislation". As legislation in EU law also encompasses decisions, this phrase would mean that objections can also be made based on whether the standard complies, not only with an accompanying New Approach directive, but also with the policy requirements set out in the mandate.

Art. 10 §1 mentions "policy objectives clearly stated in the Commission's request". The absence of policy aims and most requirements in the smart grid standardization mandate means that the Commission thus, first of all, has but a few requirements that can determine if they have satisfied the mandate before publishing it in the Official Journal. However, there still need to be policy requirements to be met, laid down in the mandate. Currently the policy aims and requirements are not specified in the standardization mandate. Therefore, aims and requirements that are not codified can also not be verified on compliance.
It should be noted that the smart grid standardization mandate was issued in a period before the New Regulation came into force, and it thus complied with the Information Directive. The mandate was in force until 2012, but it has not been replaced. Further work is based on iterations[436] of the mandate concern the years 2013 and 2014 and this work will be continued in 2015. Since 2013 the New Regulation was already in force. These iterations should therefore comply with the demands of the New Regulation. Nevertheless, the iterations are still based on the old mandate, which does not comply with the New Regulation.
The New Regulation requires that policy aims and requirements be clearly stated in the standardization mandate. It also provides several mechanisms to verify whether these aims and requirements are incorporated. However, no such policy aims and requirements are stated in the standardization mandate, nor are they addressed in the iterations.

[436] Commission Communication: The annual Union programme for European standardization, COM(2013)562, p.7.

6.5 Applying the principles of good governance

The system that lays down policy aims and requirements in the mandate provides a material safeguard in terms of providing guidance on the standard's substance. Nonetheless, to ensure that the mandate's requirements are also incorporated into the standardization process, procedural guidelines are helpful. As discussed in Chapter 3, the Commission cannot match the level of expertise of standardization participants. To a certain extent, the Commission will thus need to rely somewhat on determining whether the process of standardization is an adequate process to assess the incorporation of the aims and requirements in the standard. Describing policy aims and requirements in the mandate only provides a minimal safeguard. Ensuring a fair and balanced process in which policy aims and requirements are optimally addressed requires a procedural framework. The policy aims and requirements are laid down in broad terms, whereas the standard's implementation will still involve considerations of economic efficiency and commercial stakes. Therefore, decision-making during the implementation phase demands procedural guidelines that support those decisions.

Moreover, procedural guidelines support the incorporation of interests that are not anticipated in the mandate. In case certain interests are overlooked in the mandate, these procedural safeguards can help reveal these interests. The health concerns that we mentioned in the smart meter case were an example of such an interest. In this section, we discuss the principles of good governance as a procedural framework for standardization.

Although the applicability of these principles tends to focus on official EU institutions, it has been argued that the principles have recently become applicable for bodies beyond these institutions.[437] We will first discuss their applicability for the ESOs. Subsequently, we will elaborate on how the principles of good governance can be applied to provide procedural safeguards that ensure the optimal inclusion of mandate requirements.

6.5.1 Procedural safeguards for ICT development

The importance of ensuring that technology is developed in a way that considers future consequences is acknowledged in global policy and research in the field of ICT and law. In this section, we will give an overview of some developments that make a case for procedural guidelines in ICT development. They do not necessarily concern binding provisions and more often concern guidance documents. At this stage, the aim is not to

[437] E.g. Curtin, D. et al. (2013) Constitutionalising EU Executive Rule-Making Procedures: A Research Agenda, *European Law Journal,* 19(1), p. 2-3.

unravel the procedural requirements themselves, but to make the need for procedural principles visible.

A recent Commission Communication on Internet Governance proposes a principles-based approach in the technical development of the Internet. It requires multi-stakeholder processes to be transparent, inclusive and balanced, and accountable.[438] Regarding standardization, it specifically addresses the necessity of procedural guidelines in the same vein as "code is law":

> "Technical details of Internet protocols and other information technology specifications can have significant public policy implications. Their design can impact on human rights such as users' data protection rights and security, their ability to access diverse knowledge and information, and their freedom of expression online. It also affects other stakeholders, including companies conducting business online, whose security concerns also need to be taken into account [....] An effective multistakeholder approach to specification setting on the internet will be based on efficient mutual interactions between technical and public policy considerations so that technical specifications more systematically take into account public policy concerns."[439]

This communication stresses the importance of involving stakeholders and considering public policy concerns, which are smart grid policy aims and requirements in our case.

On an international level the World Summit on the Information Society (WSIS) specifically addresses the necessity of procedural guidelines in the development of ICT in the Geneva Declaration of Principles.[440] The aim of these principles is to support technological development that enables people to use their full potential, promotes sustainable development and improves quality of life. The Declaration of Principles gives a rather elaborate view of what the ICT infrastructure should look like, which parties need to influence the developments (e.g., governments and NGOs) and which values should be considered (e.g., health care, environmental protection, the facilitation of dialogue between cultures). Furthermore, the Transatlantic Consumer Dialogue (TACD) report on the Principles of Harmonization specifically addresses standards.[441] The TACD is a forum for US and EU consumer organizations that is supported by the EU Commission and aims to provide input for political negotiations between the two

[438] Commission Communication: Internet Policy and Governance, COM(2014)72, p. 6.
[439] Ibid. p. 8-9.
[440] Geneva Declaration of Principles, WSIS-03/GENEVA/DOC/0004, Geneva December 2003.
[441] TACD (2000) *Principles of Harmonization*, No. Trade 8-00, retrieved on 15 December 2014: http://test.tacd.org/wp-content/uploads/2013/09/TACD-TRADE-08-00-Principles-of-Harmonization.pdf

continents. The Commission's response to the report states that "harmonisation, by definition, means that technical regulations and standards change. The key is to ensure that this is not downwards towards the lowest common denominator."[442] This document mainly focuses on standards that have consequences for public interests such as health and environment. It addresses procedural aspects such as accountability, equal participation amongst countries, and openness of the process.

Apart from international policy that encourages the incorporation of procedural principles, this necessity is also discussed in academia. Scholars in the field of law and ICT increasingly observe the importance of incorporating procedural elements, transparency and accountability into the development of new technologies when these elements have normative effects.[443] Especially in smart environments, such as smart grids, these procedural criteria are a key element to ensure the legitimacy of code. Transparency is for example needed because in such environments default settings are invisible, and therefore may enforce certain behavior without the user knowing it.[444] This viewpoint is more specifically relevant to the development of standards because it is most important in the preparatory phase of technology development. Because private standardization bodies have an especially important role in creating regulatory code, there is a need for more transparency and participation in the standardization process.[445] Applying procedural principles to the standardization process increases the likelihood that decisions will be made that safeguard public interests.[446] Additionally, it is recognized that the principles of administrative law can contribute to the standardization process to this respect.[447]

[442] European Commission Services (2000), *TACD Recommendations on Trade and European Commission Services' Response*, Washington, retrieved on 15 December 2014:
[443] For an overview of authors se e.g. Koops, B. (2007) *Criteria for Normative Technology*, TILT Law & Technology Working Paper No. 005/2007, or in relation to the incorporation of values in design of normative technology see Friedman, B., et al. (2008) Value sensitive design and information systems, in: Himma, k. & Tivani, H. (eds.) *The Handbook of Information and Computer Ethics*, New Jersey: John Wiley & Sons.
[444] This is one of the key points in the theory of "code is law" as described in chapter 5, further see Hildebrandt, M. & Koops, B. (2010) The Challenges of Ambient Law and Legal Protection in the Profiling Era, *Modern Law Review,* 73(3), p. 454.
[445] Berman, P. (2000) Cyberspace and the State Action Debate: The Cultural Value of Applying Constitutional Norms to Private Regulation. *U. Colo. L. Rev.*,71, p. 1307.
[446] Donnely, M. (2007) *Delegation of governmental powers to private parties: a comparative perspective*, Oxford: University Press, p. 294.
[447] Büthe, T. & Mattli, W. (2011) The new global rulers: The privatization of regulation in the world economy, Princeton: University Press, p. 224-226.

6.5.2 The applicability of the principles of good governance

The question remains as to which specific procedural guidelines the standardization process should adhere. For European standardization, these principles can be found in the EU principles of good governance.

These principles play an important role in European governance, especially since the publication of the White Paper on European Governance. The White Paper was written to stimulate the involvement of European citizens and organizations in EU policymaking.[448] The promotion of EU good governance is further codified in art. 15 TFEU. Good governance plays a crucial role in EU policy, especially in situations where entities other than the official EU institutions (partly) execute the decision making. To be sure, we do not argue that the application of good governance will be the ultimate solution for safeguarding the policy aims and requirements. However, we will observe their applicability procedural safeguards for standardization on a EU level for this case in this section.

In the following subsections, we will first discuss what the principles of good governance are and why they are applied. We will then assess the relevance of the principles of good governance as safeguards for policy aims and requirements for smart grid standardization.

6.5.2.1 Good governance

The discussion on good governance started in the early 1990's as an important element in light of the EU's development and social policy.[449] Principles of good governance and administration are embedded in the administrative procedures of the Member States. The principles of good governance were developed based on those existing national principles.

The EU Commission published its White Paper on European Governance (White Paper) in 2001. It declared that a reformation of EU governance was one of the four strategic aims of the early 2000s.[450] This reformation was to be based on the five principles good governance: openness, participation, accountability, effectiveness and coherence.

Currently, the term 'good governance' is used in different EU policy contexts, often referring to slightly different meanings of the concept. To illustrate, a search queue of 'good governance' on the EUR-LEX website returns 262 results for legislation alone.[451]

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[448] European Governance- A White Paper, COM(2001)428, OJ 2001 C 287.

[449] E.g. Commission Communication: human rights, democracy and development, SEC(92)1915, §2.4 or Resolution on human rights in the world in 1993-1994 and the Union' s human rights policy, OJ 1995 C126 §51 and Opinion of the committee of the Regions on the White Paper on European social policy: ' A way forward for the Union', OJ 1995 C 210 §39.

[450] Commission Communication: European governance - A white paper, OJ 2001 C287, p.3.

[451] On 23 November 2014.

More recently, good governance is even codified (but not defined) by treaty in article 15 §1 of the TFEU: "In order to promote *good governance* and ensure the participation of civil society, the Union's institutions, bodies, offices and agencies shall conduct their work as openly as possible." In this sense, openness thus serves good governance and participation.[452]

Close to the principles of good governance are the principles of good administration. The principles of good administration have their roots in national law. Good administration is codified in the EU Charter in art. 41.[453] For example, this article includes the right to be heard and the right to a reasoned decision. The 2013 Code of Good Administrative Behavior by the European ombudsman contains a more extensive list of principles of good administration.[454] It elaborates on the right of art. 41 "and promotes the public interest in an open, efficient, and independent European administration." In addition, the European Parliament issued a resolution on a Law of Administrative Procedure of the European Union. It refers to the 'Unions Administration', which includes bodies, offices and agencies.[455] In response, the Commission started an investigation into the current state of administrative procedure in the EU.[456]

The European principles of good governance entail more than just good administration, as they do not only apply to procedures in which decision making directly affects citizens. For example, in relation to openness, these principles require the active publication of annual reports.[457]

6.5.2.2 Relevance of the principles of good governance for standardization

The role of good governance as a legal concept is growing, especially since the introduction of good governance in the TFEU. Specifically, the ECJ has stressed the

[452] Alemanno, A. (2014) Unpacking the Principle of Openness in EU Law Transparency, Participation and Democracy, *European Law Review,* 1.
[453] Charter of Fundamental Rights of the European Union, OJ 2000 C 364.
[454] European Ombudsman: The European Code of Good Administrative Behaviour, Strasbourg 2013, retrieved 24 Novemer 2014: http://www.ombudsman.europa.eu/en/resources/code.faces#/page/1
[455] European Parliament resolution of 15 January 2013 with recommendations to the Commission on a Law of Administrative Procedure of the European Union, (A7-0369/2012) annex recommendation 1.
[456] Follow up to the European Parliament resolution with recommendations to the Commission on a Law of Administrative Procedure of the European Union, adopted by the Commission on 24 April 2013, SP (2013)251.
[457] Bransma, G., et al. (2008) How Transparent are EU 'Comitology' Committees in Practice, *European Law Journal*, 14(6), p. 824.

importance of transparency more than once, which could indicate the start of a stronger legal position for the principles.[458]

The good governance discourse in Europe has mainly focused on official EU institutions, but the applicability of good governance appears to reach beyond these institutions. Although it is not definite that the principles of good governance apply to entities other than the EU's official institutions, there is a tendency to agree that their scope extends beyond these institutions to, for example, numerous EU agencies.[459] The White Paper defines governance as the "rules, processes and behaviour that affect the way in which powers are exercised at European level"[460]. This definition is certainly a broad interpretation that potentially includes numerous EU-level activities and organizations.

It is also argued that good governance is actually specifically applicable to situations of public-private cooperation, which is not delegation of powers.[461] Moreover, in the aforementioned art. 15, TFEU refers to "bodies, offices and agencies" that promote good governance and civil participation. In the context of the TFEU, the scope of good governance is thus not solely limited to official institutions. However, the legal effects on the other bodies and institutions have not yet crystallized.

In addition, the Commission explicitly states that principles of good governance apply to standardization.[462] First, the Commission states that observing the White Paper's principles is necessary for the accountability of European standardization. It also suggests that the principles are, to a certain extent, already applied, but their application should be enhanced.

As we saw in previous sections, the contribution of principles of administrative law for standardization as they are present in national legal systems is identified. The principles of good governance are inspired by the Member State principles of administration and are therefore a perfect source of these principles.

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[458] An obligation of transparency is deemed necessary to ensure equal treatment in tenders for procurement in the EU. E.g. Case T-345/03 Evropaïki Dynamiki v. The Commission, ECLI:EU:T:2008:67.
or for Member States Case C-226/09, Commission v. Ireland, ECLI:EU:C:2010:697, transparency is similarly required in the situations of service concessions Case C-203/08 Sporting Exchange Ltd v Minister van Justitie, (2011) *SEW Tijdschrift voor Europees Economisch Recht*, 2, annotation de Moor- van Vugt, A.

[459] E.g. Verhoeven, A.(2005) Democratic Life According to the Constitution, in: *Good Governance and the European Union*, Curtin, D & Wessel, R. (eds.), Antwerp: Intersentia, p.167. or Van Kersbergen, K. & Van Waarden, F (2004) 'Governance' as a bridge between disciplines: Cross-disciplinary inspiration regarding shifts in governance and problems of governability, accountability and legitimacy, *European Journal of Political Research*, 43, p. 157-160, or Geradien, D. (2004) The Development of European Regulatory Agencies: What the EU should Learn from the American Experience, *Columbia Journal of European Law*,11, p. 1.

[460] Commission Communication: European governance - A white paper, OJ 2001 C287, footnote p.8.

[461] Joerges, C., & Rödl, F. (2004) Social market economy as Europe's Social Model in: Magnussen, L.& Strath, B. (eds.) *A European social citizenship*?, Brussels: Presses Interuniversitaires, Européennes, p.8.

[462] Commission Staff working Document: The challenges for European standardization, SEC(2004)1251, it moreover refers to the application of White Paper in relation to standardization beyond the single market in Commission Communication: on the role of European standardisation in the framework of European policies and legislation, COM(2004)674.

The principles that are already applicable and somewhat similar to the principles of good governance are the WTO principles, as laid down in the recommendations for standardization in the Technical Barriers to Trade Agreement.[463] It is a comprehensive list comprising transparency, openness, impartiality, consensus, effectiveness, relevance and coherence. The WTO principles are applicable to standardization through the General Guidelines of Cooperation for the ESOs.[464] These principles are not legally binding.[465] However, as the ESOs have signed the Technical Barriers to Trade (TBT) agreement in which the WTO principles are laid down, they play a role in European standardization.[466]

6.5.3 Employing the principles in standardization

The fact that decision-making in the EU not only stems from the formal institutions, but is intertwined in a web of different levels and bodies, makes the applications of the good governance principles throughout these decision-making processes crucial. EU standardization is part of this web and we conclude this chapter with some thoughts on which principles can contribute to the process, and how.[467] Which procedural principles of good governance are suitable depends on the circumstances in which they are applied. The expression of the principles will be different according to the circumstances in which they are applied.[468] For example, EU fisheries policy enumerates eleven specific principles; [469] while environmental policy specifically focuses on participation of stakeholders;[470] and the guidelines of the European Central Bank focus on integrity.[471] Therefore, at this stage, we can only tentatively indicate which principles are appropriate for standardization. The question of how they should be implemented, let alone supervised, will not be addressed.

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[463] Decisions and Recommendations adopted by the WTO Committee on Technical Barriers to Trade since 1 January, retrieved on 1 September 2014: http://www.wto.org/english/tratop_e/tbt_e/tbt_e.htm
[464] Additionally impartiality and relevance are also principles for standardization through the WTO.
[465] Vademecum on European Standardization Part IV, European standadisation in the International context (Internal EC Working Document) retrieved on 19 August 2014: http://ec.europa.eu/enterprise/policies/european-standards/documents/vademecum/.
[466] Annex 4 Decision of the Committee on Principles for the Development of International Standards, Guides and Recommendations.
[467] Mendes, J. (2011) *Participation in EU Rulemaking: A Rights-Based Approach*, Oxford: University Press, p. 120-124, or Curtin, D. et al. (2013) Constitutionalising EU Executive Rule-Making Procedures: A Research Agenda, *European Law Journal,* 19(1), p. 2-3.
[468] Lavrijssen-Heijmans, S. (2006) Onafhankelijke mededingingstoezichthouders, regulerende bevoegdheden en de waarborgen voor good governance, (Dissertation) Tilburg University, p. 41
[469] Art. 3 Regulation 1380/2013 on the Common Fisheries Policy, OJ 2013 L 354.
[470] Art. 10(a) Decision 1600/2002/EC laying down the Sixth Community Environment Action Programme, OJ 2002 L 242.
[471] Art. 8 Guideline of the European Central Bank, 21 April 2010 on Target2-Securities (ECB/2010/2).

Answering this question would require a detailed study of the processes themselves, along with some type of cost benefit analysis about what is feasible for industry. After all, we do not suggest that the standardization system produced by industry experts is deficient in itself. Therefore, it would be undesirable to introduce procedural guidelines that are so strict that market parties flee to informal standardization fora and consortia. A proper analysis of what is feasible thus requires empirical and economic research that falls outside the scope of this research.

There are three principles that are linked to issues that emerged throughout this research. These are participation, openness and accountability

6.5.3.1 Participation

The White Paper describes participation as a crucial element for achieving the quality, relevance and effectiveness of EU policy and for increasing confidence in the end result.[472] The foundation of the White Paper is the improvement of involvement and participation of citizens. Standardization in and of itself is an expression of the principle of participation, as interested market parties become part of the decision-making process. They participate in the NSBs and ESOs. Participation as a principle of good governance means that all of those potentially affected should be able to participate in the process.[473] In other words, there should be participation beyond that of industry experts, who are already part of the process.

Coming back to the Theory of "code is law", Lessig addresses the topic of participation from a democracy viewpoint.[474] He argues that, as long the free choice argument –we discussed in section 5.1.1- holds up, a form of democracy through influence of those that are regulated is not necessary, in other cases some type of democracy is necessary. To this respect, he makes a distinction between the regulated being a member, or 'citizen' of a group (a country, a university, a church, online communities) or a consumer of a product on a free market. Smart grid standards cannot be compared to this situation. Consumers will not become citizens or members of smart grids. Nonetheless, consumers will neither be able to choose between the regulations built into smart grid standards, as is the case in a product on a free market. In line of the reasoning in "code is law" democracy in the form of participation, especially of users, is desirable in the development of smart grid standards.

Participation, whether seen from the perspective of democracy or not, is a method to balance interests of those affected by the decisions made. Especially in the case these decision that are not viewed as law in a traditional sense have some legal consequences –

[472] Commission Communication: European governance - A white paper, OJ 2001 C 287, p. 10-11.
[473] Mendes, J. (2011) *Participation in EU Rulemaking: A Rights-Based Approach*, Oxford: University Press, p.25.
[474] Lessig, L. (2006). *Code, version 2.0,* New York: Basic Books, p. 285-293.

such as reference in law- participation is important to balance interests.[475] In smart grid standardization, participation thus helps to counterbalance the industry-oriented process.

Moreover, we observed that participation is an important issue in relation to competition law. The question of whether stakeholders can effectively participate potentially affects whether a standard qualifies as an unlawful horizontal cooperation agreement. As discussed in Chapter 3, the cases of the X/Open group and EMC development both involved the lack of opportunities to participate and influence the standardization process.

The current situation creates the risks of biased interests representation. [476] Underrepresentation of societal stakeholders is also a problem on the global level. In global standard setting, the representation of public interests is also minimal, with only 1 percent participation in, for example, the Codex Alimentarius.[477]

The inclusion of societal stakeholders is addressed in the New Regulation, but it is questionable whether these stakeholders have actual influence on the standard's outcome. The system of national representation only allows member state representatives to vote, entailing that societal stakeholders cannot vote. The objective of national representation is democratic legitimacy, while in effect it does not contribute to democratic legitimacy, apart from the formality that all Member States are represented. Multi-nationals can use this system to strengthen their participation, at the expense of smaller companies. A multi-national, by definition, is based in different countries. It is thus possible to abuse this system of national representation to send national representatives from different Member States that represent the same company to the ESO standardization process. [478] It is common that parties have subsidiaries simultaneously in different national bodies to influence the EU process.[479]

In addition, we questioned the ability of non-industry parties or smaller companies to effectively participate. Their dependence on voluntary experts and lack of financial means keeps them from participating at the same level as industry experts. The official EU societal stakeholders receive financing to participate. On a national level the non-industry parties and smaller companies might be able to participate. However, they will not become a representative on the EU level as that process is significantly more

[475] Mendes, J. (2013) *Rule of law and participation: a normative analysis of internationalised administrative procedures?*, *Jean Monnet Working Paper* No. 13/13, 2013, New York: NYU School of Law.
[476] Héritier, A. (2003) Composite Democracy in Europe: a role of transparency and access to information, *Journal of European Public policy*, 10(5), p. 818.
[477] Wallach, L. (2001) Accountable Governance in the Era of Globalization: The WTO, NAFTA and International Harmonization of Standards, *Kansas Law Review, 50*, p. 836.
[478] Cargill, F. (15-17 September 1999). Consortia and the evolution of Information technology Standardization, presented at *the 1st Conference on Standardisation and Innovation in Information technology,* p. 19
[479] Büthe, T. & Mattli, W. (2011) The new global rulers: The privatization of regulation in the world economy, Princeton: University Press, p. 160 or p. 185.

expensive and intensive to participate. The same is true for the DSOs, as their business is the operation of the grid, not developing its technology and are therefore less likely to afford to participate in the expensive and time-consuming process of European standardization. However, this does not mean that they have no stake in the way the smart grid will work. Actual direct participation is therefore obstructed.
Furthermore, ESOs do not seem able to rid themselves of any unfair practices. For example, planning voting over the Christmas holidays can still occur within ESOs.[480]
One important implication of improving the access to standardization for all relevant stakeholders is that an already unpredictable process becomes even more unpredictable.
The participation of all relevant groups should be allowed during standardization, which grants the possibility of effective participation in the process.[481] A level playing field for SMEs and societal stakeholders will support the participation of all relevant interests in the process.
Industry parties participate in with the aim of influencing the outcome to their advantage. If more parties are able to influence the outcome their ability to influence is weakened. When increasing participation, careful consideration is called for to ensure that industry incentive to participate maintains, as they are obviously indispensible from the process.

6.5.3.2 Openness

The White Paper describes the application of the principle of openness in the following way:

> "The Institutions should work in a more open manner. Together with the Member States, they should actively communicate about what the EU does and the decisions it takes. They should use language that is accessible and understandable for the general public. This is of particular importance in order to improve the confidence in complex institutions."[482]

In addition to this description in the White Paper, access to documents is an important aspect of openness. Access to documents is codified in the Charter (art. 42) and the TFEU (art. 15). Regulation 1049/2001 further elaborates the public access to documents

[480] Egyedi, D. (2001) Beyond Consortia, Beyond Standardisation?–New Case Material and Policy Threads, Report for the European Commission, p. 43 retrieved 6 januari 2015: ec.europa.eu/enterprise/newsroom/cf/_getdocument.cfm%3Fdoc_id%3D4565+&cd=1&hl=en&ct=clnk.
[481] E.g. Council Conclusions of 1 March 2002 on standardization, OJ 2002 C 66.
[482] Commission Communication: European governance - A white paper, OJ 2001 C 287.

of the EU institutions.[483] Citizens need to be able to obtain access to documents that concern them and the institutions actively need to provide this access. Openness is important for those directly involved in the process, as well as the general public.[484]

In relation to administrative law, openness is often defined through different elements (e.g., the availability, accuracy and clarity of information) and refers to information that is actually necessary to understand one's position, using clear language and supporting actions with reasons.[485] The principle of transparency is similar to openness and is often used interchangeably.[486] We include transparency in the principle of openness.

In the theory of 'code is law' openness plays an important role. Openness in this sense relates to the openness of the code used, as well as non-proprietary code.[487] If we come to terms with the fact that code regulates, openness allows us to at least know how we are regulated.[488] This is true for standards as well. If the content of standards is freely accessible, those affected by standards are able to understand their consequences. This way, the possible consequences for policy aims and requirements can be discerned more easily.

In standardization specific research, the "open standards" concept is one of the most debated terminologies, and several scholars have attempted to formulate a definition; however, no uniform definition exists.[489] This concept relates to open participation for whoever wants to join and the openness of the standard itself, in the sense that it is available for everyone, possibly even free of charge. In this discussion of open standards, there is often a distinction made between 'open' and 'proprietary' standards. However, proprietary merely signifies that a party has intellectual property rights on the standard. A proprietary standard can, therefore, still be open in relation to its open participation in the process.

In relation to the proprietary nature of official standards we found that the openness of the final standard itself is also problematic. The price of complying with accumulated standards can be burdensome for smaller companies. It is argued, yet also contested, that

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[483] Regulation 1049/2001 regarding public access to European Parliament, Council and Commission documents, OJ 2001 L 145.

[484] Commission Communication: Towards a reinforced culture of consultation and dialogue - General principles and minimum standards for consultation of interested parties by the Commission, COM(2002)704, p.17.

[485] E.g. Mock, W. (1999)On the Centrality of Information Law: a Rational Choice Discussion of Information Law and Transparency, *Journal of Computer & Information Law*, 17, or Alemanno, A. (2014) Unpacking the Principle of Openness in EU Law Transparency, Participation and Democracy, *European Law Review,* 1, p. 81..

[486] Buijze, A. (2013) *The Principle of Trancsparency in EU Law,* (Dissertation) Utrecht University, p. 29.

[487] In Lessig's discussion the use of open source is crucial. In smart grids the use of open source is well-discussed as well (e.g. Dugan, C.& McDermott, T. (2011 July 24-28) *An open source platform for collaborating on smart grid research*, presented at IEEE Power and Energy Society General Meeting. However, the discussion of the benefits and implications of the use of open source as such fall outside the scope of this research.

[488] Lessig, L. (2006). *Code, version 2.0,* New York: Basic Books, p. 151.

[489] West, J. (2000) The economic realities of open standards: black, white, and many shades of gray, in: Greenstein, S. & Stango, V. (eds.), *Standards and Public Policy*, Cambridge: University Press.

proprietary standards discourage innovation by reducing competition.[490] In addition, there is the issue addressed in the Dutch Knooble case, in which proprietary standards generally become legally binding. The final standard's openness can contribute to eliminating the barriers created by the proprietary nature of standards. Especially in terms of legislative references, openness (i.e., free access to the standard) it is necessary to allow parties to understand how to comply with the law. The Dutch government is in the process of redeeming mandatory standards to make them publically available.
Art. 4 of the New Regulation only describes the exchange of drafts and subsequent comments between the ESOs, NSBs and the Commission. The title of the article is "transparency", and the process is referred to as the "public enquiry" phase. However, how well this process actually lives up to the expectations that these labels conjure up is debatable. The part in which the NSBs collect comments on the draft standard is not regulated here. NSBs apply different policies to a certain extent, which means that in certain cases the drafts are only circulated to parties in the national preparatory process or that not all drafts are available, perhaps only after the payment of a fee in some cases. Moreover, this system makes it impossible for parties that comment on the draft to understand what is eventually done with their comments, as NSBs formulate national views and ESOs only have to reply to those views, not the individual comments. However, timely information about the process is crucial to contribute to the standardization process.[491] At the time a draft standard is finalized the process is already rather advanced. At this stage, it will be more likely that the effort to change the draft standard and partly start over the negotiations will outweigh the possible improvements made in the comment.

Enhancing openness requires that the language used is understandable. Openness can be viewed as a prerequisite for participation. Only if participants are able to understand exactly what is at stake and what the choices to be made are, can they participate in a meaningful way.[492] It can be argued that openness includes a pro-active responsibility for the ESOs to ensure that information about the standardization process is provided in an accessible fashion.[493] In the New Approach to standardization so-called New Approach Consultants write reports that are supposed to help the Commission identify possible

[490] Shen, X. (2007) Developing Country Perspectives on Software: Intellectual Property and Open Source Standardization Research, Jacobs, K. in*: Standardization Research in* Information Technology: New Perspectives, New York: IBI Global, p.229.
[491] Büthe, T. & Mattli, W. (2011) The new global rulers: The privatization of regulation in the world economy, Princeton: University Press, p. 45.
[492] Magnette, P. (2003) European governance and civic participation: beyond elitist citizenship?, Political studies 51(1) .

[493] Curtin, D. (2009) *Executive Power of the European Union: Law, Practices, and the Living Constitution*, Oxford: University Press, p. 207.

conflicts with the essential requirements.[494] A similar practice can help, not only the Commission, but also societal interest representatives and users to understand the consequences of standards in the standardization process of smart grids.

In a similar vein, when applying the principle of openness, the standardization committees will need to communicate in plain language, at least in relation to the aspects that concern the mandate's policy aims and requirements. After all, technical experts cannot be expected to decide what is in the best interest of society, and protection via transparency is needed.[495] In particular the public enquiry phase could benefit from more openness by, for instance, requesting further information about how individual comments are considered. Better communication to all relevant stakeholders about the draft standards is also necessary to ensure that, besides the parties already included in the process, other relevant interested parties can deliver comments.

Finally, it should be considered to what extent the proprietary nature of European standards should be retained in the light of openness. The ESOs obtain EU funding for the activities necessary for developing standards.[496] On the other hand, the market parties invest their own means and expertise to develop the standards. Subsequently, the ESOs sell the standards to whoever needs to comply with the standard. This way the ESOs have two separate sources of income, one up front by the EU to fund their work and one afterwards in the sale of the standards. This while at the same time they only facilitate the process and do not even develop the standards themselves. In light of the aforementioned benefits of making standards publically available, it needs to be considered if the proprietary nature of European standards is justified. We saw that in the Dutch case the government invested in making mandatory standards publically available, even though they still financed the NSB to develop the standard. In case making standards publically available is economically not feasible, it should at least be considered in which way the threshold that proprietary standards create for smaller companies could be mitigated.

6.5.3.3 Accountability

Accountability is sometimes referred to as the reason to introduce good governance. The lack of accountability in new forms of governance is essentially the reason why the principles of good governance have become so important the last years.[497] In this sense,

[494] Hofmann, H. et al. (2011) *Administrative Law and Policy of the European Union Administrative Law and Policy of the European Union*, Oxford: University Press, p.601.
[495] Addink, H (Forthcoming March 2015) *Good Governance: Concept and Context*, Oxford: University Press, p. 89.
[496] Art. 15 New Regulation on European Standardisation no. 1025/2012, OJ 2012 L 316.
[497] Addink, H (Forthcoming March 2015) *Good Governance: Concept and Context*, Oxford: University Press, p. 134.

good governance should improve the accountability of decision-making. The White Paper addresses accountability as a separate principle of good governance, as do we. The White Paper connects it to responsibility and the act of underpinning decisions with reasons:

> "Roles in the legislative and executive processes need to be clearer. Each of the EU Institutions must explain and take responsibility for what it does in Europe. But there is also a need for greater clarity and responsibility from Member States and all those involved in developing and implementing EU policy at whatever level."

At its most basic, accountability denotes giving reason or explanation for what one does.[498] The principle of accountability goes further than the principles openness as it not only requires the communication of relevant information, but also justifying the decisions made. An important problem emphasized in "code is law" is precisely that code interferes with the ability to hold the regulators accountable.[499]

The General Guidelines on Cooperation mention that the Commission expects the ESOs to "[e]nsure that rules in decision-making procedures continue to preserve accountability to European Community."[500] How this accountability is effectuated is unclear. The only parties that really understand the consequences of the standard are those involved in developing or applying the standards, which is only a small part of the European Union. More importantly, there is no obligation for the technical committees to provide their motivations for making certain decisions. When considering what we saw in the "code is law" discussion, these decisions can have important consequences, but those affected by the standards cannot know why certain decisions are made. Moreover, we saw that art. 10 §6 of the New Regulation suggests that the Commission assesses whether the standards satisfy the requirements of the harmonization legislation. Nonetheless, the Commission is not capable of thoroughly verifying whether standards comply with the relevant policy requirements due to the technical complexity of the standards.

A broader definition of accountability includes an aspect of 'holding to account' and also face the consequences of decisions.[501] Some even argue that this aspect is a crucial

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[498] Fisher, E. (2004) The European Union in the age of accountability, *Oxford Journal of Legal Studies,* 24(3) p. 497.

[499] E.g. Lessig, L. (2006). *Code, version 2.0,* New York: Basic Books, p. 138.

[500] General Guidelines for the Cooperation between CEN, CENELEC and ETSI and the European Commission and the European Free Trade Association, 28 March 2003, OJ 2003 C 91.

[501] Bovens, M. (2007) Analysing and assessing accountability: a conceptual framework, European law journal 13(4), p. 450.

element for actual accountability.[502] An interesting question that follows this type of accountability, is who is accountable? Are it the individual industry representatives setting the standards, or can the ESOs themselves also be held accountable? The ESOs are currently not judicially held accountable for their activities. While we saw several competition law cases against the companies involved in the standardization process in Chapter 3, no competition law enforcements have been made against the ESOs.[503]
Accountability contributes to the understanding of why certain decisions are made. The Commission can thus review the reasons that explain how policy aims and requirements are safeguarded, once these items are codified in the mandate. This motivation increases the accountability of the standard developers.
One important drawback in accountability is that it can become vacillating. If accountability causes the standard setters to grow indecisive because consensus is obstructed when all decisions need to be reasoned, accountability obviously is applied to vigorously.

6.6 Conclusion

In this chapter, we started with the examination of the current possible mechanisms to safeguard smart grid policy aims and requirements. We addressed the following three mechanisms:
First, the public enquiry phase is an important attempt to make the standardization process more transparent and to allow for broader participation. However, because the NSBs have varying policies about which drafts they publish and for what price, this mechanism is unable to ensure that the smart grid policy aims are safeguarded.
Second, the required involvement of societal stakeholders and SMEs is a good improvement in the New Regulation. However, in practice, it is still difficult for these stakeholders to have a meaningful influence on the process, given their lack of means, expertise, time and voting rights.
Third, as already mentioned, it remains to be seen whether formal objections by the Parliament and Member States can be made for standards that are not in line with the New Approach, as is the case with smart grid standards. However, in relation to the altered status of the standardization mandate, these formal objections could possibly be based on the mandate itself.

[502] Papadopoulos, Y. (2010) Accountability and multi-level governance: more accountability, less democracy? West European Politics, 33(5) p. 1034..
[503] Pierce, J. & Medzmariashvili, M. (2014) Standards: Competition and Innovation?, p. 7, Available at SSRN.

In the review of the standardization work itself, we observed that there did not appear to be any safeguards for policy aims and requirements, except for data protection requirements. The structure of the process through the SGAM suggests that policy aims are assumed to be unaffected as long as they are not deliberately addressed. However, as we saw in Chapter 2 and Chapter 5, in relation to "code is law", it is quite unlikely that none of the decisions will affect policy aims and requirements. Although policy aims and requirements are not explicitly addressed, the standard may still have an impact on them.
The current system does not necessarily result in policy aims and requirements not being incorporated into standards at all. Nonetheless, as these aims and requirements are not safeguarded in the legal framework, the optimal facilitation of the aims in the standards is impeded.
The policy aims and requirements need to be clearly defined in the standardization mandate to ensure that they are sufficiently supported by standardization. To abide with the mandate, it must be clear with which requirements the standards need to comply. Currently, the aims and requirements are addressed quite poorly in the smart grid standardization mandate. When requirements are only determined after the standard has been set, there is a chance that the standard does not comply with those requirements.
To subsequently ensure that standardization meets the mandate's requirements, procedural guidelines are necessary. The principles of good governance provide a relevant source for such procedural safeguards. We observed that the principles of participation, openness and accountability can especially benefit the process. Their application supports the inclusion of the mandate's aims and requirements. Better participation for all relevant interests and active clarity on standardization decisions support the input of interests related to the smart grid aims and requirements. Moreover, increasing the accountability of ESOs contributes to the Commission's ability to verify whether the mandate's aims and requirements are complied with. The principles can also address other drawbacks of the current standardization system, such as the proprietary nature of standard.

7 Discussion and conclusion

In this chapter, we summarize our main findings and answer the subquestions. We also explain the answer to the research question and describe desirable future research.

7.1 Main findings

The research question is as follows:

- **RQ:** *How can policy aims and requirements be safeguarded in the technical standardization of smart grids?*

We answered this question by answering these four subquestions:

- **SQ1:** What is the current EU legal framework for standardization?
- **SQ2:** What are the policy aims and requirements for smart grids?
- **SQ3:** What is the legal status of standards?
- **SQ4:** Are policy aims and requirements sufficiently secured by the current legal and regulatory system of standardization?

Smart grids play a crucial role in the EU energy policy of pursuing a well functioning market, integrating production of energy from renewable sources and achieving high energy-efficiency while maintaining security of supply and protecting the consumer. Smart grids require standards, and because standards can have an important impact on smart grid development, they also play an important role in supporting that policy. The absence of common standards is a problem, as it creates an uncertainty that keeps market participants from investing in smart grid development. The EU Commission acknowledged the importance of smart grid standards and requested that European standardization organizations set the standards through a standardization mandate.
Technical experts of market parties executed and are still in the process of executing this request in the European standardization organizations that facilitate this process. This expert involvement is reasonable, as these experts are best suited to develop these standards. However, there is a problem because the wide range of EU aims and requirements (i.e., energy efficiency, the integration of renewable energy, security of supply and consumer protection) for smart grid development are not incorporated into the EU Commission's mandate to set the standard.

The Dutch smart meter case showed that the standard caused undesired infringements on policy aims and requirements and that it was subsequently not adopted. These infringements mainly concerned privacy protection and the intended energy efficiency via this meter's introduction. At the same time, in regard to privacy protection, the current European smart grid standardization case has a head start compared with the Dutch smart meter case. The mandate repeatedly addresses the necessity of incorporating privacy protection for the customer. However, there are other aspects of consumer protection that do not relate to privacy. As we saw, electricity end users play a crucial role in smart grids due to their role in adjusting their demands and producing renewable energy.[504] Their protection is key, but they will unknowingly be regulated by standardized technology and are underrepresented in the process as well. In addition, other policy aims and requirements are not addressed in the smart grid standardization mandate.

In Chapter 3, we addressed **subquestion SQ1** about the current EU legal framework for standardization. We observed that the New Approach to Standardisation was introduced in the 1980s to—among other things—eliminate the restrictions that standards present for cross-border trade. New Approach standards need to comply with essential policy requirements in the accompanying New Approach directives. However, smart grid standardization is not based on a New Approach directive and therefore does not need to comply with those requirements.
In 2013, the New Regulation on Standardisation entered into force. This regulation addresses several issues, and we highlighted the following four topics, which are especially relevant for this research.
The first topic concerned the inclusion of societal stakeholders and small and medium-sized enterprises in the standardization process. The New Regulation requires that European standardization organizations encourage and facilitate the inclusion of societal stakeholders and small and medium-sized enterprises and emphasizes the position of small and medium-sized enterprises in national standardization bodies. Moreover, the New Regulation introduces the possibility for the EU Parliament or Member States to formally object to standards if they believe that the standards contradict relevant policy requirements. Furthermore, the New Regulation partly codifies the public enquiry phase, in which comments can be made on draft standards via national standardization bodies.
Another relevant change involves the altered status of the standardization mandate. The New Regulation indicates that it is a decision, as opposed to its former status as a

[504] Huygen, A. (2011) De consument en de (on)vrije elektriciteitsmarkt, in: S. Pront- van Bommel (eds.) *De consument en de andere kant van de elektriciteitsmarkt*, Amsterdam UvA Centrum voor Energievraagstukken, p. 102-107.

contract, which means that the mandate needs to be viewed in light of higher legislation and provides an option to make a formal objection based on incompliance with the mandate. We also observed that the New Regulation suggests that the EU Commission verify whether standards meet the policy requirements. In practice, however, a thorough verification is usually impossible due to the complex technical nature of standards.
Next to standard-specific legislation, competition law also confers restrictions on standard development. When standards create restrictions on competition that are not outweighed by efficiency gains, the standard violates competition law. Moreover, the FRAND policy ensures that when standards contain essential patents, they need to be licensed on fair, reasonable and non-discriminatory terms. A case of patent ambush is, for instance, an obvious breach of FRAND terms.
The standardization mandate provides the sole legal framework for smart grids. The mandate, however, barely refers to the policy aims and requirements for smart grids. It describes certain aims as a background, but not in the part concerning the mandated work itself. The only requirement that is clearly stressed is the importance of data protection in the standard's development.

In Chapter 4, we addressed **subquestion SQ2** regarding policy aims and requirements for smart grids. Policy aims are the objectives for which smart grids should be developed. Requirements are the essential legal aspects that smart grids need to consider; they are not the purpose of smart grids. Smart grid aims originate from the general energy policy set out in the Treaty on the Functioning of the European Union: a well-functioning energy market, ensuring supply, the integration of renewable energy and energy efficiency, and the interconnection of networks. Moreover, energy-specific legislation, particularly the Third Electricity Directive, clearly focuses on the consumer protection requirement. Consumer protection in smart grids also means that consumers' (personal) data are sufficiently protected.
Finally, an analysis of soft law documents shows varying smart grid aims. The objectives of energy efficiency and the integration of renewable forms of energy clearly prevail here.
These aims and requirements are scarcely addressed in the legal framework that we discussed in Chapter 3, which would not be so much of a problem if standards merely influenced technological issues and their use was voluntary. The "code is law" theory in Chapter 5 showed that neither is the case.

Chapter 5 addressed **subquestion SQ3** about the legal status of standards. We discussed code's capacity to regulate, as, for example, in the case of cookies that determine how a user's information is stored. Developing code includes decisions that can have repercussions for individuals and society in general. Standards have an even

greater capacity to regulate. By definition, standards reduce choice because possibilities that are not included in the standard are excluded. For example, a standard not only restricts user interests but also other public interests when it shuts off solar power installations whenever the frequency on the grid rises above 50.2 hertz, thus hampering the increase of renewables' integration into the electricity grid.
Moreover, standards bind users in practice because users often cannot circumvent being regulated by code, and they are usually unaware that they are being regulated. More importantly, standards can even become legally binding. The main objection to considering standards as law is that standards are not developed by a recognized public authority. We observed that when national legislation referred to standards, they became legally binding. Moreover, in the Fra.bo case, the European Court of Justice determined that standardization organizations could be equated to public authorities when they also performed certification activities. Therefore, although standards are not law in a strict sense, their binding nature and capacity to regulate is equal to that of law. The one quality that they lack, namely being developed by a public authority, is also the one quality that would ensure safeguards for individual and general interests in the decision-making process. Therefore, there is even more of a necessity for legal safeguards.

In Chapter 6, we addressed **subquestion SQ4** about whether the legal framework described in Chapter 3 sufficiently ensured the policy aims and requirements discussed in Chapter 4.
We observed that while the New Approach did not apply to smart grid standardization, the safeguards that came with the New Regulation on Standardisation only partially safeguarded smart grid aims and requirements.
First, in theory, the inclusion of societal stakeholders and small and medium-sized enterprises could provide a safeguard for the policy aims and requirements. ANEC can supervise the inclusion of consumer interests; ECOS can supervise energy efficiency and integrating renewables; and small and medium-sized enterprises can influence the process to safeguard their position on the market. However, the current system still has drawbacks for effective influence. While national representation benefits a fair representation of Member States, only national representatives can vote. Societal stakeholders are thus excluded from voting. Furthermore, national standardization bodies in different countries observe divergent policies on the inclusion of societal stakeholders and small and medium-sized enterprises. These differences also obstruct the participation of all relevant stakeholders at the national level. Moreover, societal stakeholders lack sufficient means and expertise to fully participate, as do small and medium-sized enterprises. Only delegates from vendors with sufficient expertise are represented in the European standardization process.

There is also the public enquiry phase, which provides an opportunity for parties that are excluded from the standardization process (e.g., potentially end-users) to comment on the draft standards of national standardization bodies. However, this phase is also not adequately harmonized and may differ depending of the policy of each national standardization body. These bodies do not all publish every single draft, nor do they all make them available for free. In addition, national standardization bodies send a national view to European standardization organizations. How the comments are processed in that view is up to the national standardization body. Subsequently, the New Regulation does not prescribe how European standardization organizations need to process national views, nor does it recommend which way they need to respond to them. There is thus little transparency about what is ultimately done with all of the comments collected in the national-level public enquiry phase. Furthermore, the possibility of formal objections could be a way to ensure that the standards do not harm the policy aims or requirements that are set out in harmonized legislation after the standards are finalized. However, compliance with policy aims or requirements cannot be tested because they are not codified in legislation. This problem results from a lack of requirements in the mandate and a corresponding New Approach directive.
Therefore, in their own right, the three available mechanisms do not constitute sufficient safeguards for the aims and requirements for smart grids.

7.2 The research question: How can policy aims and requirements be safeguarded in the technical standardization of smart grids?

All in all, there is a framework in place for the standardization of smart girds. This framework is quite elaborate in safeguarding EU competition law. However, safeguarding other policy aims and requirements for smart grids (e.g., environmental protection and consumer protection), this framework only provides minimal safeguards. The New Regulation stimulates the involvement of societal stakeholders, but it does not improve their position in the voting stage. Moreover, the New Regulation suggests that the Commission verify that standards are in line with policy requirements, but because the standards are too technical for the Commission to comprehend fully, this verification is only marginal.
Because the Commission itself cannot standardize, it depends on the standardization system in which technical experts develop standards within European standardization organizations. This system is valuable, but it requires further improvements.
The answer to the research question contains material and procedural elements. With the status of a Commission decision, the mandate becomes part of the harmonized union

legislation with which compliance of standards can be tested, and formal objections can also be made if the standards do not comply with the mandate. The mandate thus needs to be clear about these aims and requirements. In the Dutch smart meter case, the requirements were only determined long after the requests for standardization had been made, which resulted in standards and rolled out meters that were not in line with those requirements. This case shows that the mandate needs to be very clear from the outset about what aims and requirements the standard needs to meet, which is particularly important for data protection. The Commission understood this importance and codified data protection requirements in the mandate. The other requirements are, nonetheless, neglected in the mandate. To sum up, to safeguard policy aims and requirements in the standardization process, these aims and requirements need to be clarified in the mandate, which in turn provides the material safeguard.

The procedural element refers to the procedural safeguards that are necessary to ensure that mandate requirements are actually incorporated into the standardization process and relevant interests related to policy aims and requirements are properly balanced. We observed that these procedural safeguards can be found in the application of principles of good governance. The principle of openness can contribute to the transparency of the process. Participation can support the position of societal stakeholders and SMEs in the process. Finally, accountability helps the commission to verify whether the decisions made in the process are sufficiently in line with policy aims and requirements.

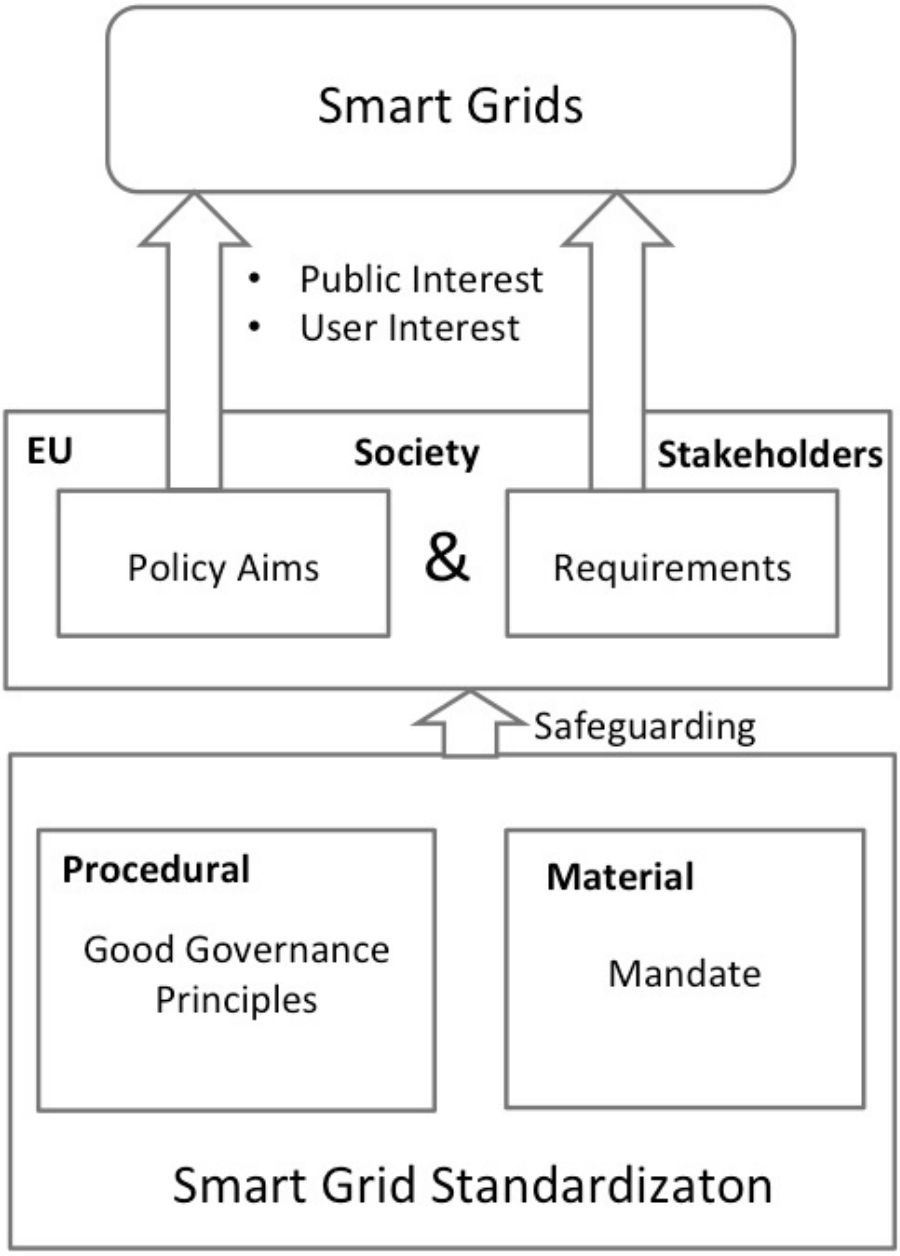

Figure 7.1 Safeguarding smart grid aims & requirements

7.3 Future research

One important area for future research involves the operationalization of principles of good governance in the standardization process. Our research primarily focused on the present situation for standards and smart grids. We showed that existing safeguards are insufficient and highlighted principles of good governance as a means of improving the

procedural side of standardization. In particular, we identified the principles of participation, openness and accountability as pivotal elements in the process. It is crucial to answer the following questions in future research: Are there other principles, besides those from the White Paper on European Governance, that are useful for standardization? How should they be made operational, implemented and supervised?
Moreover, there are different levels of strictness to apply the principles. For example, participation can go as far as providing every random person the right to vote in the process, and openness can mean a layman's explanation for every single technical detail. Such measures would be quite disproportionate. Extensive study on the actual standardization processes, together with a cost benefit analysis about what is feasible for industry, may provide insights into what is needed to determine the level of strictness in standardization application. After all, we do not suggest that industry experts abolish the system of standardization. Therefore, it would be undesirable to introduce procedural guidelines that are so strict that market parties flee to informal standardization fora and consortia. A proper analysis of what is feasible requires future empirical and economic research.
Another crucial question that fell outside of the scope of this research is whether the EU Commission should mandate the development of standards at all, when is does not concern New Approach standards. In the case of smart grids the EU Commission has great confidence in the market to take care of their deployment. If they refrain from prescribing specific essential requirements, why would it be their competence to mandate standards at all? If the market will take care of smart grid deployment, then why not let the market develop standards without the interference of the ESOs? It is an interesting topic to study whether the practice of mandating standards outside the scope of the New Approach is justifiable.

Bibliography

Addink, H. (Forthcoming March 2015) *Good Governance: Concept and Context*, Oxford: University Press.

Albrechtslund, A. (2007) Ethics and technology design. *Ethics and Information Technology*, *9*(1).

Alemanno, A. (2014) Unpacking the Principle of Openness in EU Law Transparency, Participation and Democracy, *European Law Review,* 1.

Anderson, D. & Murphy, C. (2012) The Charter of Fundamental Rights, in: Bioni, A et al. (eds.) *EU Law after Lisbon*, Oxford: University Press.

Asscher, L. (2006) 'Code' as Law. Using Fuller to Assess Code Rules, in: Dommering, E. & Asscher, L. (eds.) *Coding Regulation, Essays on the Normative Role of Information Technology,* Cambridge: University Press.

Austin, J. (1861) *The Province of Jurisprudence Determined*, London: Spottiswood.

Baldwin, R., et al. (1998) *A reader on regulation*. Oxford: University Press.

Baldwin, R., et al. (2012). *Understanding regulation: theory, strategy, and practice*, Oxford: University Press.

Bartl, M. (2010) The Affordability of Energy: How Much Protection for the Vulnerable Consumers?, *Journal of Consumer Policy,* 33.

Bekkers, R., et al. (2002) Intellectual property rights, strategic technology agreements and market structure; the case of GSM, *Research Policy* 31(7).

Benoliel, D. (2004) Comment, Technological Standards, Inc.: Rethinking Cyberspace Regulatory Epistemology, *CAL. L. REV*. ,92.

Bentham, J. (1970) Of Laws in General, edited by HLA Hart, London: Athlone Press.

Berman, P. (2000) Cyberspace and the State Action Debate: The Cultural Value of Applying Constitutional Norms to Private Regulation. *U. Colo. L. Rev*.,71.

Berrang, P., et al. (2012) Dependability results for power grids with decentralized stabilization strategies, Reports of SFB. TR 14 AVACS 83, retrieved 6 January 2015: http://www.avacs.org/Publikationen/Open/avacs_technical_report_083.pdf.

Besselink, L. (2012) Informal International Lawmaking: Elaboration and Implementation in the Netherlands in: Duquet, S., et al. (eds.) *Informal international lawmaking: case studies*, The Hague: Torkel Opsahl Academic EPublisher.

Biddle, B., et al. (2011) The Expanding Role and Importance of Standards in the Information and Communications Technology Industry, *Jurimetrics*, 52.

Biddle, B., et al. (2012) The Expanding Role and Importance of Standards in the Information and Communications Technology Industry. *Jurimetrics*, 52.

Blind, K. (2004) *The Economics of Standards, Theory, Evidence, Policy*, Cheltenham: Edward Elgar Publishing

Blind, K. (2009) *Standardisation as a Catalyst for Innovation*, Inaugural Lecture for the Erasmus University Rotterdam.

Boekema, J. & Huitema, G. (2008) *Belemmering innovatie energiemarkt door implementatie voorgestelde Slimme Meter',* TNO Informatie- en communicatietechnologie, Groningen.

Borraz, O. (2007) Governing standards: the rise of standardization processes in France and in the EU. *Governance*, *20*(1).

Bovens, M. (2007) Analysing and assessing accountability: a conceptual framework, *European law journal* 13(4).

Bransma, G., et al. (2008) How Transparent are EU 'Comitology' Committees in Practice, *European Law Journal*, 14(6).
Brownsword, R. (2005) Code, control, and choice: why East is East and West is West, *Legal Studies*, 25(1).
Buijze, A. (2013) *The Principle of Trancsparency in EU Law,* (Dissertation) Utrecht University.
Büthe, T. & Mattli, W. (2011) *The new global rulers: The privatization of regulation in the world economy*, Princeton: University Press,
Cavoukian, et al. (2010) Privacy by Design: essential for organizational accountability and strong business practices, *Identity in the Information Society*, 3(2).
Cheung, A. (2014) Location privacy: The challenges of mobile service devices, *Computer Law & Security Review*, 30(1).
Clastres, C. (2011) Smart grids: another step towards competition, energy security and climate change objectives, *Energy policy,* 39(9).
Cockfield, A. (2004) Towards a Law and Technology Theory. *Man. LJ*, 30.
Cohen, J. (2007) Cyberspace as/and Space, *Columbia Law Review*,107(1).
Cuijpers, C. & Koops, B. (2008) *Het wetsvoorstel 'slimme meters': een privacytoets op basis van art. 8 EVRM,* TILT- Centrum voor Recht, Technologie en Samenleving, Tilburg.
Curtin, D. (2009) *Executive Power of the European Union: Law, Practices, and the Living Constitution*, Oxford: University Press.
Curtin, D. et al. (2013) Constitutionalising EU Executive Rule-Making Procedures: A Research Agenda, *European Law Journal,* 19(1).
De Brito, A. & Pelkmans, J. (2012) Pre-empting technical barriers in the Single Market, *CEPS Policy Brief*, 277.
De Moor- van Vugt, A. (2011) Annotation: Case C-203/08 Sporting Exchange Ltd v Minister van Justitie, (2011) *SEW Tijdschrift voor Europees Economisch Recht*, 2.
De Moor- van Vugt, A. (2011) Handhaving en toezicht in een Europese context, in: S. Pront-van Bommel (eds.) *De consument en de andere kant van de elektriciteitsmarkt*, Amsterdam: UvA Centrum voor Energievraagstukken, 2011.
Deconinck, G. (2008, 12-15 May) *An evaluation of two-way communication means for advanced metering in Flanders (Belgium)*, presented at IEEE Instrumentation and Measurement Technology Conference 2008.
Dolmans, M. (2003) Standards for Standards, *Fordham Int'l Law Journal,* 26.
Dommering, E. (2006) Regulating technology: code is not law. in: Dommering, E. & Asscher, L. (eds.) *Coding Regulation, Essays on the Normative Role of the Information society*, The Hague: TMC Asser Press.
Donnely, M. (2007) *Delegation of governmental powers to private parties: a comparative perspective*, Oxford: University Press.
Douglas, D., et. al (2009) *Citizen Engineer: A handbook for socially responsible engineering*, Crawfordsville Indiana: Pearson Education.
Dugan, C.& McDermott, T. (2011 July 24-28) *An open source platform for collaborating on smart grid research*, presented at IEEE Power and Energy Society General Meeting.
Dworkin, R. (1978) *Taking Rights Seriously,* Cambridge MA: Harvard University press.
Egan, M. (2001) *Constructing a European Market: Standards, Regulation, and Governance: Standards, Regulation, and Governance*, Oxford: University Press.
Egyedi, D. (2001) Beyond Consortia, Beyond Standardisation?–New Case Material and Policy Threads, Report for the European Commission, retrieved 6 januari 2015: ec.europa.eu/enterprise/newsroom/cf/_getdocument.cfm%3Fdoc_id%3D4565+&cd=1&hl=en&ct=clnk.

Elferink, M. (1998) *Verwijzingen in wetgeving: Over de publiekrechtelijke en auteursrechtelijke status van normalisatienormen*, (Dissertation) Leiden University.
Elferink, M. (2007) Auteursrecht op normalisatie-normen revisited, In: Visser, D. & Verkade, D. (eds.) *Een eigen oorspronkelijk karakter,* Amsterdam: DeLex.
Engle Merry, S. (1988) Legal Pluralism, *Law and Society Review,* 22(5).
Falke, J., & Joerges, C., ((2010) New Approach to Technical Harmonization and Standards, Its Preparation through ECJ Case Law on Articles 30, 36 EEC and the Low-Voltage Directive, and the Clarification of Its Operating Environment by the Single European Act, *The Hanse Law Review*, 6.
Farrel, H. (2002) Hybrid Institutions and the law: Outlaw arrangements or interface sollutions?, *Zeitschrift fur Rechtssoziologie,* 23(1).
Fisher, E. (2004) The European Union in the age of accountability, *Oxford Journal of Legal Studies,* 24(3).
Friedman, B., et al. (2008) Value sensitive design and information systems, in: Himma, k. & Tivani, H. (eds.) *The Handbook of Information and Computer Ethics*, New Jersey: John Wiley & Sons.
Froomkin, A. (2000) Wrong Turn in Cyberspace: Using ICANN to Route around the APA and the Constitution, *Duke LJ*, 50(1).
George, M., et al. (2011) *Too many hurdles: information and advice barriers in the energy market*. Leicester: Centre for Consumers and Essential Services, retrieved 30 December 2014: https://www2.le.ac.uk/departments/law/research/cces/documents/Too-Many-Hurdles-2011.pdf
Geradien, D. (2004) The Development of European Regulatory Agencies: What the EU should Learn from the American Experience, *Columbia Journal of European Law*,11.
Ghafurian, R. (2011) Smart grid: The electric energy system of the future, *Proceedings of the IEEE*, 99(6).
Gidari, A. (2006) "Designing the Right Wiretap Solution: Setting Standards under CALEA", *IEEE Security & Privacy*, 4(3).
Goldsmith, J. (1998) Against cyberanarchy, *The University of Chicago Law Review,* 65(4).
Gorywoda, L. (2009) New European Legislative Framework for the Marketing of Goods, *Colum. J. Eur. L.*, 16.
Graber, C. (2011) *Internet creativity, communicative freedom and a constitutional rights theory response to "code is law"*, i-call Working Paper no 2010/03, Zurich: Universität Luzern.
Griffiths, J. (1986) What is Legal Pluralism, *Journal of Legal Pluralism and Unofficial Law,* 24(1).
Grijalva, S., & Tariq, M. (2011, 1-3 Dec.). *Prosumer-based smart grid architecture enables a flat, sustainable electricity industry,* presented at IEEE Innovative Smart Grid Technologies (ISGT).
Gungor, V., e t al. (2011) Smart grid technologies: communication technologies and standards *, IEEE transactions on Industrial informatics*, *7*(4).
Hahn, R. & Weidtmann, C. (2012) Transnational Governance, Deliberative Democracy, and the Legitimacy of ISO 26000: Analyzing the Case of a Global Multi-Stakeholder Process, *Business & Society,* 20(10).
Haney, A., et al. (6-9 June 2011) *Smart metering and electricity demand: Technology, economics and international experience*, 21st International Conference on Electricity Distribution, Frankfurt.
Hart, H. (1961) *The Concept of Law*, Oxford: Oxford University press.

Helberger, N. (3-5 May 2013) *Freedom of expression and the Dutch cookie-wall*, MIT 8 Public Media Private Media Conference.
Héritier, A. (2003) Composite Democracy in Europe: a role of transparency and access to information, *Journal of European Public policy*, 10(5).
Hijmans, H. (2006) The European data protection supervisor: the institutions of the EC controlled by an independent authority. *Common Market Law Review*,43(5).
Hijmans, H. (2010) Recent developments in data protection at European Union level, *ERA Forum*, 11(2).
Hildebrandt, M. & Koops, B. (2010) The Challenges of Ambient Law and Legal Protection in the Profiling Era, *Modern Law Review,* 73(3).
Hildebrandt, M. (2011) Legal Protection by Design. Objections and Refutations, *Legisprudence* 5(2).
Hoenkamp, R., et al. (2013) Law and standards - Safeguarding societal interests in smart grids, in: Leenes, R. & Kosta, E. (eds.), *Bridging distances in technology and regulation*, Oisterwijk: Wolf Legal Publishers.
Hof, S., & Stuurman, C. (2006) Code As Law?, in: Koops, B., et al. (eds) *Starting Points for ICT Regulation,* The Hague: T.M.C. Asscher Press.
Hofmann, H. et al. (2011) *Administrative Law and Policy of the European Union Administrative Law and Policy of the European Union*, Oxford: University Press.
Huygen, A. (2011) De consument en de (on)vrije elektriciteitsmarkt, in: S. Pront- van Bommel (eds.) *De consument en de andere kant van de elektriciteitsmarkt*, Amsterdam UvA Centrum voor Energievraagstukken.
Jamasb, T., & Pollitt, M. (2005) Electricity market reform in the European Union: review of progress toward liberalization & integration, *The Energy Journal*, 26.
Joerges, C., et al. (1999) *The law's problems with the involvement of non-governmental actors in Europe's legislative processes : the case of standardisation under the 'new approach',* EUI Working Paper LAW No. 99/9, San Domenico: European University Institute,.
Joerges, C., & Rödl, F. (2004) Social market economy as Europe's Social Model in: Magnussen, L.& Strath, B. (eds.) *A European social citizenship*?, Brussels: Presses Interuniversitaires, Européennes.
Joerges, C. & Micklitz, H. (2010) The need to supplement the new approach to technical harmonization and standards by a coherent European product safety policy, *HanseLR,* 6(2).
Kabisch, S., et al. (4-6 Oct. 2010) *Interconnections and communications of electric vehicles and smart grids*, presented at 2010 First IEEE International Conference on Smart Grid Communications (SmartGridComm).
Kadurek, P., et al. (11-13 Oct. 2010) *Theft detection and smart metering practices and expectations in the Netherlands*, presented at IEEE Innovative Smart Grid Technologies Conference Europe (ISGT Europe).
Kanchev, et al. (2011). Energy management and operational planning of a microgrid with a PV-based active generator for smart grid applications. Industrial Electronics, *IEEE Transactions on Industrial electronics*, 58(10).
Kica, E., & Bowman, D. (2013). Transnational Governance Arrangements: Legitimate Alternatives to Regulating Nanotechnologies?, *NanoEthics*, 7(1).
Kirsch, M. S. (2011) Do-Not-Track: Revising the EU's Data Protection Framework to Require Meaningful Consent for Behavioral Advertising, *Rich. JL & Tech.*, 18(1).
Kleve, P., & Mulder, R. (2005) Code is Murphy's law, International Review of Law Computers & Technology, 19(3).

Koops, B. & Lips, A. (2003) Wie reguleert het internet? Horizontalisering en rechtsmacht bij de technische regulering van het internet, in: Franken, H. (eds.) *Zeven essays over informatietechnologie en recht*, Den Haag: Sdu Uitgevers.
Koops, B. (2007) *Criteria for Normative Technology*, TILT Law & Technology Working Paper No. 005/2007.
Koppel, J. (2010) *World Rule: Accountability, Legitimacy and the Design of World Governance*, The University of Chicago press.
Kramer, A. et al. (2014) Experimental evidence of massive-scale emotional contagion through social networks, *Proc Natl Acad Sci USA,* 24.
Langheinrich, M. (30 Sept.- 2 Oct. 2001) *Privacy by design—principles of privacy-aware ubiquitous systems*, presented at *Ubicomp: Ubiquitous Computing*.
Lastowka, F. (2006) Decoding Cyberproperty, *Ind. L. Rev.*.
Latour, B. (1992) Where are the missing masses? The sociology of a few mundane artifacts. In: Bijker, W. & Law, J. (eds.), *Shaping Technology,* Cambridge: The MIT Press.
Lavrijssen-Heijmans, S. (2006) Onafhankelijke mededingingstoezichthouders, regulerende bevoegdheden en de waarborgen voor good governance, (Dissertation) Tilburg University.
Lavrijssen, S. (2012) Inaugural lecture for the University of Amsterdam, *De verschillende gezichten van de energieconsument: naar een gedragseconomische benadering van de regulering van de energiesector*.
Leenes, R. (2011) Framing techno-regulation: An exploration of state and non-state regulation by technology. *Legisprudence*, *5*(2).
Lemley, M. (2002) Intellectual Property Rights and Standard-Setting Organizations, *California Law Review*, 90.
Lessig, L. (1999). Code is law. *The Industry Standard*, *Harvard Magazine*, retrieved from: http://harvardmagazine.com/2000/01/code-is-law-html.
Lessig, L. (2006) *Code, version 2.0,* New York: Basic Books.
Lim, A. S. (2006) *Power Battles in ICT Standard-Setting Process, lessons from mobile payments*, (Dissertation), Eindhoven University of Technology.
Liserre, M., et al., (2010) Future energy systems: Integrating renewable energy sources into the smart power grid through industrial electronics *Industrial Electronics Magazine, IEEE*, 4(1).
Liu, Q., et al. (January 2003) *Digital rights management for content distribution* presented at the Australasian information security workshop conference on ACSW frontiers.
Lockton, D., et al. (June 4-6 2008) Design with intent: Persuasive technology in a wider context, presented at Third International Conference Persuasive Technology.
Lucchi, N. (2011) Access to Network Services and Protection of Constitutional Rights: Recognizing the Essential Role of Internet Access for the Freedom of Expression, *Cardozo J. Int'l & Comp. L.*, 19.
Lundqvist, B. (2014) *Standardization under EU Competition Rules and US Antitrust Laws: The Rise and Limits of Self-Regulation*, Cheltenham: Edward Elgar Publishing.
Maher, I. (2011) Competition law and transnational private regulatory regimes: Marking the cartel boundary. *Journal of Law and Society*, *38*(1).
Mariniello, M. (2011) Fair, Reasonable and non-discriminatory (FRAND) terms: A Challenge for competition Authorities, *Journal of Competition Law & Economics*, 7(3).
Markard, J., et al. (2004). The impacts of market liberalization on innovation processes in the electricity sector, *Energy & Environment*, 15(2).
Markard, J., & Truffer, B. (2006) Innovation processes in large technical systems: Market liberalization as a driver for radical change?, *Research Policy*, 35(5).

Magnette, P. (2003) European governance and civic participation: beyond elitist citizenship? *Political studies,* 51(1) .
Mason, R. (1986) Four ethical issues of the information age*, Mis Quarterly*,10(1).
Meeus, L., et al (2010) *Smart Regulation for Smart Grids*, Working papers RCSAS no. 2010/45, Florence: EUI.
Mendes, J. (2011) *Participation in EU Rulemaking: A Rights-Based Approach*, Oxford: University Press.
Mendes, J. (2013) *Rule of law and participation: a normative analysis of internationalised administrative procedures?*, *Jean Monnet Working Paper* No. 13/13, 2013, New York: NYU School of Law.
Mock, W. (1999)On the Centrality of Information Law: a Rational Choice Discussion of Information Law and Transparency, *Journal of Computer & Information Law*, 17.
Mohsenian-Rad, A. H., et al (2010) Autonomous demand-side management based on game-theoretic energy consumption scheduling for the future smart grid, *IEEE Transactions on Smart Grid*, *1*(3).
Momoh, J. A. (2009 15-18 March), *Smart grid design for efficient and flexible power networks operation and control*, presented at IEEE Power Systems Conference and Exposition.
Mueller, M. (2010) *Networks and States, The Global Politics of Internet Governance,* Cambridge: The MIT Press.
Murray, P. (1997) Adequacy Standard under Directive 95/46/EC: Does US Data Protection Meet This Standard, *The. Fordham Int'l LJ*, 21.
Nielsen, A. & Popkin, B. (2003) Patterns and trends in food portion sizes, 1977-1998, *JAMA-J Am Med Assoc*, 4.
Palensky, P., & Dietrich, D. (2011) Demand side management: Demand response, intelligent energy systems, and smart loads, *IEEE Transactions on Industrial Informatics, 7*(3).
Papadopoulos, Y. (2010) Accountability and multi-level governance: more accountability, less democracy? *West European Politics,* 33(5).
Pipattanasomporn, M., et al. (2009 15-18 March). *Multi-agent systems in a distributed smart grid: Design and implementation*, presented at IEEE Power Systems Conference and Exposition.
Potter, C. , et al. (2009 15-18 March), *Building a smarter smart grid through better renewable energy information*, presented at Power Systems Conference and Exposition.
Poullet, Y. (2006) EU data protection policy. The Directive 95/46/EC: Ten years after, *Computer Law & Security Review*, *22*(3).
Post, D. (2000) What Larry Doesn't Get: Code, Law, and Liberty in Cyberspace. *Stanford Law Review,* 52(5).
Post, D. (2002) Against "Against Cyberanarchy", *Berkeley Technology Law Journal*, 17(1).
Pront-van Bommel, S. (2011), Smart energy grids within the framework of the Third Energy Package, *European Energy and Environmental Law Review*, 20(2).
Reidenberg, J. (1998) Lex Informatica: The Formulation of Information Policy Rules Through Technology, *Tex. L. Rev,* 76(3).
Rotenberg, M., & Jacobs, D. (2013) Updating the Law of Information Privacy: The New Framework of the European Union, *Harvard Journal of Law & Public Policy*, 36(2).
Sanders, A. (2010) Standards Setting in the ICT Industry? IP or Competition Law? A Comparative Perspective, *Os 10 anos de Investigação do CIJE – Estudos Jurídico-Económicos*.

Schepel, H. (2005) *The constitution of private governance : product standards in the regulation of integrating markets,* Portland: Hart Publishing.
Schepel, H. (2013) The New Approach to the New Approach: The Juridification of Harmonized Standards in EU Law, *Maastricht Journal of European and Comparative Law*, 12(4).
Schrock, A. (2014) HTML5 and openness in mobile platforms. *Continuum*, 28(6).
Scott, C., et al. (2011) The conceptual and constitutional challenge of transnational private regulation. *Journal of Law and Society*, 38(1).
Sencar, M, et al. (2014) Development of EU (European Union) energy market agenda and security of supply,*Energy,* 77 p. 118.
Specht, M. (2013) Smart Metering in European Context, in: Ulsar et al. (eds.) *Standardization in Smart Grids*, Heidelberg: Springer.
Specht, M. & Rohjans, S., ICT and Energy Supply: IEC 61970/61968 Common Information Model in: Ulsar et al. (eds.) *Standardization in Smart Grids*, Heidelberg: Springer.
Staniszewski, P. (2007) The interplay between IP rights and competition law in the context of standardization, *Journal of Intellectual Property Law & Practice*, 2(10).
Stern, S. (2011) Smart-Grid: Technology and the Psychology of Environmental Behavior Change. *Chi.-Kent L. Rev.*, *86*.
Stuurman, C. (1992) Legal aspects of standardization of information technology and telecommunications: an overview, *Computer Law & Security Review,* 8(1).
Stuurman, C. (1995) *Technische Normen en het Recht*, (Dissertation) VU University Amsterdam.
Stuurman, C. (2009) annotation case Knooble/Staat en NNI, *AMI/Tijdschrift voor auteurs-, media en informatierecht*, 2.
Swann, P., et al. (1996) Standards and trade performance: the UK experience, *The Economic Journal*, 106(438).
Swann, G. (2010) International standards and trade, OECD Trade Policy Papers, no.97 OECD Publishing.
Sweeney, L. (2002) K-anonymity: A model for protecting privacy, *International Journal of Uncertainty, Fuzziness and Knowledge-Based Systems*, 10(05).
Swora, M. (2010) Intelligent Grid: Unfinished Regulation in the Third EU Energy Package. *J. Energy & Nat. Resources L.*, 28.
Tauberman, A. (2009) International Governance and the Internet, in: Adward & Waelde (eds.), *Law and the Internet,* Portland: Hart Publishing.
Teubner, G. (1991) Two Faces of Janus: Rethinking Legal Pluralism, *The.Cardozo L. Rev.*, 13.
Thaler, R. & Sunstein, C. (2008) *Nudge: Improving decisions about health, wealth, and happiness*, Yale: University Press.
Weiser, P. (2001) Internet governance, standard- setting, and self regulation, *N. Ky. L. Rev.*, 28.
Werle & E. Iversen (2006) Promoting Legitimacy in Technical Standardization, *Science, Technology &Innovation Studies,* 2(1).
Ulsar, M (2013) Looking Aheead: The Future of Smart Grid Communications and Standardization, in: Ulsar et al. (eds.) *Standardization in Smart Grids*, Heidelberg: Springer.
Ulsar, M. (2013) Introduction and Smart Grid Basics, in: Ulsar et al. (eds.) *Standardization in Smart Grids*, Heidelberg: Springer.
Van Gestel, R. (2012) Hoge Raad is duur, over het verwijzen naar normalisatie normen in wetgeving, *RegelMaat*, 4(27).

Van Gestel, R., & Micklitz, H. (2013) European integration through standardization: how judicial review is breaking down the club house of private standardization bodies, *Common market law review*, 50(1).
Van Kersbergen, K. & Van Waarden, F (2004) 'Governance' as a bridge between disciplines: Cross-disciplinary inspiration regarding shifts in governance and problems of governability, accountability and legitimacy, *European Journal of Political Research*, 43.
Van Ommeren, F, Geen algemeen verbindende voorschriften. Publiekrechtelijk algemeen geldende normen, annotation, AB 2012/228.
Vasconselos, J. (2008) *Survey of Regulatory and Technological developments Concerning Smart metering in the European Union Electricity Market,* RSCAS PP 2008/01, European University Institute, Florence.
Verhoeven, A.(2005) Democratic Life According to the Constitution, in: *Good Governance and the European Union*, Curtin, D & Wessel, R. (eds.), Antwerp: Intersentia.
Vincent, C., & Camp, J. (2004) Looking to the Internet for models of governance, *Ethics and Information Technology*, 6(3).
Waddington, L. (2013) *Reflections on the Protection of 'Vulnerable' Consumers under EU Law*, Maastricht Working Papers, 2013-2.
Wallach, L. (2001) Accountable Governance in the Era of Globalization: The WTO, NAFTA and International Harmonization of Standards, *Kansas Law Review, 50*.
West, J. (2000) The economic realities of open standards: black, white, and many shades of gray, in: Greenstein, S. & Stango, V. (eds.), *Standards and Public Policy*, Cambridge: University Press.
Wijckmans, F. & Tuytschaever, F. (2011) *Vertical Agreements in EU Competition Law*, Oxford: University Press: New. York.
Winn, J., & Jondet, N. (2008) A "New Approach" to standards and consumer protection. *Journal of consumer policy*, 31(4).
Winner, L. (1997) Cyberlibertarian Myths And The Prospects for Community, *Computers and Society,* 27(3).
Wong, R. (2011) Data protection: The future of privacy, *Computer law & security review*, 27(1).
Wu, T. (2003) When Code Isn't Law. *Va. L. Rev.*, 89.
Yin, R. (2009) *Case study research: Design and Methods*, Thousand Oaks: Sage Publications.

Reports

CEN CENELEC and ETSI, Smart Grid Set of Standards v 3.1, retrieved 19 December 2014: ftp://ftp.cencenelec.eu/EN/EuropeanStandardization/HotTopics/SmartGrids/SGCG_Standards_Report.pdf.

CEN-CENELEC and ETSI Smart Grid Coordination Group—Smart Grid Information Security, Intermediate-Report-V1, p. 60-79 retrieved on 19 November 2014: http://www.energynetworks.org/modx/assets/files/electricity/engineering/Standards/SGCG%20Reports%20071014/SGCG_WGSGIS_Sec0078_INF_ReportforComments.pdf.

CEN-CENELEC-ETSI Smart Grid Coordination Group: Smart Grid Reference Architecture, November 2012, p.30, retrieved on 6 January 2015: http://ec.europa.eu/energy/gas_electricity/smartgrids/doc/xpert_group1_reference_architecture.pdf.

CEN-CENELEC-ETSI Smart Grid Coordination Group: Sustainable Process, November 2012, retrieved 6 January 2015: http://ec.europa.eu/energy/gas_electricity/smartgrids/doc/xpert_group1_sustainable_processes.pdf.

CEN/CENELEC/ETSI Technical Report, Functional reference architecture for communications in smart metering systems, retrieved on 24 July 2014: ftp://ftp.cen.eu/cen/Sectors/List/Measurement/Smartmeters/CENCLCETSI_TR50572.pdf

CEER (2012) *Status Review of Customer and Retail Market Provisions from the 3rd package as of 1 January 2012*, Brussels.

Costenoble, O., et al. (2005) *Strategische Verkenning 'Meetinfrastructuur en slimme meters' voor energieverbruik*, NEN, Delft.

DG Enterprise and Industry: Vademecum on European Standardization part II: Role and preparation of mandates, retrieved on 14 October 2014: http://ec.europa.eu/enterprise/policies/european-standards/files/standards_policy/vademecum/doc/preparation_of_mandates_web_en.pdf.

DG Enterprise and Industry: Vademecum on European Standardization part II: Role and preparation of mandates, p. 5, retrieved on 14 October 2014: http://ec.europa.eu/enterprise/policies/european-standards/files/standards_policy/vademecum/doc/standards_setting_governance_ev_en.pdf

DIN, European Standardization: A Successful Model of Public-Private Partnership, Berlin, retrieved on 28 November 2014: http://www.din.de/sixcms_upload/media/2896/DIN_Stand_Package_Report_FINAL.pdf

Draft ENTSO-E Network Code on Demand Connection, 21 December 2012, retrieved on 23 Dec 2014: http://networkcodes.entsoe.eu/connection-codes/demand-connection-code/.

EG3 First year report: Options on handling smart grids data, January 2013, retrieved on 4 August 14: http://ec.europa.eu/energy/gas_electricity/smartgrids/doc/xpert_group3_first_year

_report.pdf. In Chapter 5 we will elaborate on the specific policy objectives for smart grids.
ERGEG, Final Guidelines of Good Practice on Regulatory Aspects of Smart metering for Electricity and Gas, 8 February 2011, p. 35 retrieved on July 24 2014: http://www.ceer.eu/portal/page/portal/EER_HOME/EER_CONSULT/CLOSED%20PUBLIC%20CONSULTATIONS/CUSTOMERS/Smart%20metering/CD/E10-RMF-29-05_GGP_SM_8-Feb-2011.pdf.
ERGEG Public Consultation Paper, Position Paper on Smart Grids, December 2009, ref: E09-EQS-30-04, retrieved 5 December 2014: http://www.energy-regulators.eu/portal/page/portal/EER_HOME/EER_CONSULT/CLOSED%20PUBLIC%20CONSULTATIONS/ELECTRICITY/Smart%20Grids/CD/E09-EQS-30-04_SmartGrids_10%20Dec%202009_0.pdf.
ERGEG: Smart Metering with a focus on Electricity Regulation, 31 October 2007, p. 43 retrieved on 9 October 2014: http://www.ceer.eu/portal/page/portal/EER_HOME/EER_PUBLICATIONS/CEER_PAPERS/Customers/2007/E07-RMF-04-03_SmartMetering_2007-10-31_0.pdf.
ERGEG, *Status review of the definitions of vulnerable customer, default supplier and supplier of last resort*, E09-CEM-26-04, Brussels, retrieved 6 January 2015: http://www.energy-regulators.eu/portal/page/portal/EER_HOME/EER_PUBLICATIONS/CEER_PAPERS/Customers/Tab/E09-CEM-26-04_StatusReview_16-Jul-09.pdf.
EU Commission Task Force for Smart Grids, Expert group 1, functionalities of Smart Grids and Smart Meters, December 2010, p.6, retrieved 18 December 2014: http://ec.europa.eu/energy/gas_electricity/smartgrids/doc/expert_group1.pdf.
European Technology Platform on SmartGrids, Vision and Strategy for Europe's
European Commission, Guide on the implementation of EU product rules, retrieved 25 March 2014: http://ec.europa.eu/enterprise/policies/single-market-goods/files/blue-guide/guidepublic_en.pdf.
European Commission Services, *TACD Recommendations on Trade and European Commission Services' Response*, Washington, retrieved on 15 December 2014:
European Commission Vulnerable Consumer Working Group Guidance Document on vulnerable customers, November 2013 retrieved on 25 November 2014: http://ec.europa.eu/energy/gas_electricity/doc/forum_citizen_energy/20140106_vulnerable_consumer_report.pdf
European Ombudsman: The European Code of Good Administrative Behaviour, Strasbourg 2013, retrieved 24 Novemer 2014: http://www.ombudsman.europa.eu/en/resources/code.faces#/page/1
KEMA, *Domme meters worden slim? Kosten-batenanalyse slimme meetinfrastructuur*, 40510016-TDC 05-49216B, Arnhem.
NIST Framework and Roadmap for Smart Grid Interoperability Standards, Release 2.0 retrieved 21 November 2014: http://www.nist.gov/smartgrid/upload/NIST_Framework_Release_2-0_corr.pdf
Ofgem, *Smart Metering Implementation Programme, Functional Requirements Catalogue,* London, retrieved on 12 December 2014: https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/42737/1480-design-requirement-annex.pdf

Raad van State Advies RvS W14.14.0115/IV, ontwerpbesluit handel in emissierechten, retrieved on 1 December 2014: http://www.raadvanstate.nl/adviezen/zoeken-in-adviezen/tekst-advies.html?id=11425.

Shen, X. (2007) Developing Country Perspectives on Software: Intellectual Property and Open Source Standardization Research, Jacobs, K. in*: Standardization Research in Information Technology: New Perspectives*, New York: IBI Global.

Smart Grid Coordination Group Intermediate Report of the Working Group Interoperability to the grid, Mandate M/490, (retrieved on request to the NEN)

Stromback, J. & Dromacque, C. *Evaluation of residential smart meter policies,* retrieved July 2010: http://www.worldenergy.org/documents/ee_case_study__smart_meters.pdf.

Helberger, N., et al. (2004) *Digital rights management and consumer acceptability: A multi-disciplinary discussion of consumer concerns and expectations*, state of the art report for INDICARE, retrieved 1 January 2015: http://www.ivir.nl/publicaties/download/253.

SMB Smart Grid Strategic Group: IEC Smart Grid Standardization Roadmap, 2010, retrieved on 20 October 2014: http://www.iec.ch/smartgrid/downloads/sg3_roadmap.pdf.

Van Elk, K., & van der Horst, R. *Access to Standardization–Study for the European Commission, Enterprise and Industry Directorate-General*, retrieved on 3 October: http://ec.europa.eu/enterprise/policies/european-standards/files/standards_policy/access_to_standardisation/doc/access_to_standardisation_study_eim_en.pdf.

Cases

European Court of Justice

Case C12/78 Rewe-Zentral AG v Bundesmonopolverwaltung für Branntwein, ECLI:EU:C:1979:42.
Case C-194/94, CIA Security International SA v Signalson SA and Securitel SPRL, ECLI:EU:C:1996:172.
Case C-163/99 Portuguese Republic v Commission, ECLI:EU:C:2001:189.
Case C-418/01, IMS Health v NDC Health, ECLI:EU:C:2004:257.
Case T-345/03 Evropaïki Dynamiki v. The Commission, ECLI:EU:T:2008:67.
Case C-203/08 Sporting Exchange Ltd v Minister van Justitie, ECLI:EU:C:2010:307.
Case C-226/09, Commission v. Ireland, ECLI:EU:C:2010:697.
Case C-70/10 Scarlet Extended SA v Société belge des auteurs, compositeurs et éditeurs SCRL (SABAM) ECLI:EU:C:2011:771.
Case C-314/12 UPC Telekabel Wien GmbH v Constantin Film Verleih GmbH and Wega Filmproduktionsgesellschaft GmbH, ECLI:EU:C:2013:781.
Case C-171/11, Fra.bo SpA v. Deutsche Vereinigung des Gas- und Wasserfaches, ECLI:EU:C:2012:453.
Case C-131/12, Google v AEPD, ECLI:EU:C:2014:317.

General court

Case T-432/05, EMC Development v the European Commission, ECLI:EU:T:2010:189
Case T-167/08 Microsoft v Commission, ECLI:EU:T:2012:323.

Dutch Cases

Council of State, City Crash, 2 February 2011, ECLI:NL:RBSHE:2010:BL3758.
Trade and Industry Appeals Tribunal, Alfa Subsidieadviseurs, ECLI:NL:CBB:2012:BW2468.
Dutch Supreme Court, Knooble B.V, ECLI:NL:HR:2012:BW0393.

List of relevant interviews & meetings

2011:

Bram Reinders, Alliander, DSO.

2012:

Meeting Platform Smart Grids, NEN

Jesper Preuss Justesen, District Heating Bornholm DE (Ecogrid)

Poul Sonne-Pedersen,

Maja Bendtsen, Østkraft DE, (Ecogrid)

Diana Grevy Linddahl, Bronholm DE (Ecogrid)

Carsten Strunge, Energinet

Ashok Ganesh, Director Innovation CEN/CENELEC

Georges Malcorps, Senior Manager Standards Policy CEN/CENELEC

Schettini Bardo, Legal affairs, CEN/CENELEC

Henrik Dam, EU Commission DG Research & Innovation

Stephen Russel, Secretary-General ANEC

2014:

Meeting Platform Smart Grids, NEN

Peter Hermans, Stedin, DSO, member Smart Grid Coordination Group

Annex I Documents consulted for Chapter 4

Communication from the Commission

- A public-private partnership on the Future Internet COM(2009)479
- Digital Agenda for Europe COM(2010)245
- Analysis of options to move beyond 20% greenhouse gas emissions COM(2010)265
- EU 2020 Flagship initiative COM(2010)546
- Energy 2020 A strategy for competitive, sustainable and secure energy COM(2010)639
- Energy 2020 A resource-efficient Europe – Flagship initiative under the Europe 2020 strategy COM(2011)21
- Energy efficiency plan 2011 COM(2011)109
- A roadmap for moving to a competitive low carbon economy in 2050 COM(2011)112
- Long term infrastructure vision for Europe and beyond COM(2013)711

Commission staff working document

- Accompanying document communication concerning a European Strategic Eneergy Technology Plan SEC(2007)1510
- Accompanying document to the proposal of establishing a 1st radio spectrum policy programme SEC(2010)1034
- Definition, expected services, functionalities and benefits of smart grids, accompanying document to the communication Smart Grids: from innovation to deployment
- SEC (2011)463
- Accompanying the document communication A stronger European industry for growth and economic recovery, SWD(2012)297
- Technology assessment accompanying the document communication Energy Technologies and Innovation, SWD(2013)158

Recommendations

- Preparations for smart meter roll-out 2012/148/EC, OJ 2012 L 73,
- Mobilising ICT to facilitate the transition to an energy-efficient, low-carbon economy 2013/105/EC, OJ 2013 L 51
- Commission recommandation: mobilising Information and Communications Technologies to facilitate the transition to an energy-efficient, low-carbon economy, 2013/105/EC, OJ 2013 L51
- Recommendation on data protection impact assessment template for smart grids and smart meters 2014/724/EU OJ 2014 L 300

Summary

The EU electricity market is changing. We are leaving a decade of liberalization and enter a period in which the sustainability of the system and consumer participation play a more significant role. The application of ICT technology, especially by way of smart grids, is presumed to support these roles.

Smart grids may change the face of the energy systems in the EU. They potentially contribute to reducing CO_2 emissions, empower consumers and make markets more competitive. However, to what extent smart grids will contribute to these aims depends on how their technology is developed. In turn, standardization largely influences the development of their technology.

This study investigates the issue of safeguarding policy aims and requirements in the standardization process of smart grids. How can the EU aims and requirements for smart grids be safeguarded in this standardization process?

To establish the existing safeguards, this thesis first addresses the current legal framework of EU standardization and its consequences for the standardization process of smart grids. It subsequently investigates the important role of standards in society and shows that additional safeguards are crucial to ensure the incorporation of EU aims and requirements in the standardization process.

The thesis first and foremost brings to light the responsibility of the EU Commission to clarify its aims and requirements in the standardization mandate. Secondly, it proposes the application of the EU principles of good governance as procedural safeguards in the process. Finally, it discusses the possibilities and implications of their application to standardization.

Samenvatting

De Europese energie markt verandert. We verlaten een periode van liberalisering en gaan een periode tegemoet, waarin duurzaamheid en consumentenparticipatie een belangrijke rol spelen. Verwacht wordt dat 'smart grids', als applicatie van ICT technologie, deze rol zullen ondersteunen.

Smart grids kunnen het EU energie systeem verbeteren: door bij te dragen aan de reductie van CO_2 uitstoot, de consument meer invloed te verschaffen en concurrentie op de markt te verstevigen. Echter, in welke mate smart grids daadwerkelijk aan deze doelstellingen zullen bijdragen, hangt in aanzienlijke mate af van de technologie en de standaarden die worden gebruikt. Standaardisatie speelt dan ook een belangrijke rol in deze ontwikkeling.

Dit onderzoek bestudeert het aspect van het waarborgen van beleidsdoelstellingen en randvoorwaarden in het standaardisatieproces van smart grids. Hoe kunnen deze EU doelstellingen en randvoorwaarden in dit proces het beste verzekerd worden?

Deze studie onderzoekt het bestaande juridisch kader betreffende EU standaardisatie en de gevolgen ervan voor het standaardisatie proces van smart grids. De cruciale rol van standaarden in de samenleving komt aan de orde. Tevens laat deze studie zien dat nadere waarborgen noodzakelijk zijn om de EU doelstellingen en randvoorwaarden voor de energiemarkt in het standaardisatieproces tot hun recht te laten komen.

Dit onderzoek wijst nadrukkelijk op de verantwoordelijkheid van de EU Commissie om deze doelstellingen en randvoorwaarden in het mandaat tot standaardisatie uiteen te zetten. Tevens bepleit deze studie de toepassing van de EU beginselen van 'good governance' op het standaardisatie proces. Tot slot komen de mogelijkheden en implicaties van de toepassing van deze beginselen aan de orde.