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## A study on the regulatory challenges of data-driven innovation and data sharing in the digitalized utilities and how to deal with them

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# **Dealing with data:** A study on the regulatory challenges of data-driven innovation and data sharing in the digitalized utilities and how to deal with them

Brenda Paola Espinosa Apráez



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# Dealing with data:

## A study on the regulatory challenges of data-driven innovation and data sharing in the digitalized utilities and how to deal with them

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Prof. Dr. Ir. W. van der Valk (Tilburg University)

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## Summary

With the growing availability of digital technologies such as sensors, smart metering, smart grids and data analytics techniques, infrastructure managers in the utilities sector can obtain more and very detailed data about the functioning of the networks they operate and about the consumption of drinking water and electricity. These data can be used by infrastructure managers to improve or develop new ways of designing their networks, pinpointing failures, predicting the need for maintenance, enhancing demand management and other forms of data-driven innovation.

The growing collection and use of data in the utilities sector is changing the way in which infrastruc-ture managers have traditionally performed their tasks. Besides making investments to maintain and expand the physical networks, infrastructure managers now need to invest in ICT solutions and expertise in data science. In addition, becoming data-driven requires that infrastructure managers collect large amounts of very granular data from different sources, including data generated by con-sumers. Considering that utilities are highly regulated sectors that were not data-driven from the outset, it can be questioned whether existing regulatory frameworks governing those sectors are still fit-for purpose, or if changes are necessary to deal with the new opportunities and risks introduced by data-driven innovation.

The data collected by infrastructure managers can also be used by third parties to develop or improve products or services. Policymakers in the European Union have started to show interest in stimulating the sharing of these data, as illustrated by the Open Data Directive and the latest Electricity Directive adopted in 2019. Next to these two instruments, multiple horizontal legislative measures to enable a single market for data in the European Union, by means of facilitating data sharing across sectors and Member States, have been proposed and adopted in recent years. Examples of this are the General Data Protection Regulation, the Data Governance Act and the Data Act. These horizontal legal frameworks apply to, but are not specifically designed for, the utilities sector.

The resulting regulatory landscape is quite complex: the sharing of data from the utilities sector is regulated by horizontal and sectoral legal frameworks with different policy objectives, levels of implementation and supervisory authorities. In addition, different regulatory regimes apply depending on the personal or non-personal nature of the data in question, and the public or private nature of data holders and receivers.

Against this background, this dissertation investigates the regulatory challenges that arise from the growing use and sharing of data collected by infrastructure managers in the utilities sector, and possible ways to deal with these challenges. This study adopts the methodological approach of doctrinal legal research "in a broad sense", meaning that besides describing and reconstructing the law applicable to the subjects under study, this research also evaluates existing legal frameworks and provides suggestions for improvement.

This dissertation brings together two fields of research that are usually pursued separately, namely, the regulation of network industries and the regulation of data. In doing so, this study offers a comprehensive overview and in-depth analysis of existing (and upcoming) European Union and Dutch legal frameworks governing the tasks of infrastructure managers in the drinking water and electricity sectors, together with the legal frameworks applicable to the use and sharing of data collected in those sectors. Moreover, this research analyzes how the different legal frameworks relate to each other and identifies multiple challenges (in the form of regulatory gaps, uncertainties and shortcomings) for European Union and national policymakers, national supervisory authorities and infrastructure managers. This dissertation also offers suggestions to tackle those challenges, with the ultimate aim of contributing to develop more consistent and fit-for purpose (interpretations of) legal frameworks.

Dealing with data requires considering multiple (and sometimes competing) interests, rights, and policy objectives. It also involves grappling with the fact that data blur the boundaries between regulatory domains and bring traditional distinctions between public and private under pressure. This dissertation offers insights to better understand and deal with the range of regulatory challenges that result from the growing use and sharing of data in the utilities sector, whose digital transformation will continue to be high on the agenda in academic, policy and societal debates in the next years.

# CHAPTER 1

# Introduction

## 1.1. Research background

This dissertation is a study on the regulatory challenges that arise from the growing use and sharing of data collected by infrastructure managers in the utilities sector, and possible ways to deal with these challenges. This study takes place at the intersection of two broad themes. On the one hand, the changes brought by digitalization and data-driven innovation in the management of infrastructures in the utilities sector. On the other hand, the increasing interest in regulating how data are used and shared to foster the data economy in the European Union (hereafter 'EU').

### 1.1.1. Management of infrastructures, digitalization and data-driven innovation in the utilities sector

*Infrastructure management*

Physical infrastructures play a crucial role in the life and advancement of a society, due to their strong link to essential human and economic needs, constituting one of the 'backbones' of productivity and inclusiveness.[1] Thanks to infrastructures such as cables, pipes, roads or railways, citizens, and businesses can access services of general interest such as drinking water, electricity, and transport.

Due to the strategic importance of physical infrastructures, states are, in one way or another, involved in their management. In the Netherlands, for example, there are infrastructure managers that are public sector bodies governed by administrative law, such as Rijkswaterstaat, an executive agency of the Ministry of Infrastructure and Water Management, responsible for the management of the main roadway and waterway networks and the main water systems. Other Dutch infrastructure operators are legally structured as companies which have public entities as shareholders (public undertakings), including the Dutch State, provincial authorities, and municipalities. This is the case, for example, of the distribution system operators in the electricity sector, drinking water companies and managers of port infrastructure.

Besides direct control or ownership, states keep a tight hold on infrastructure managers by means of market regulation. The tasks of infrastructure managers are specified by law and different supervision mechanisms are put in place to ensure that public values such as universal access, safety, reliability, and affordability are safeguarded. The need for regulation is also justified considering that infrastructure managers often operate as (national or regional) natural monopolies. [2]

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[1] OECD, Getting Infrastructure Right (OECD Publishing 2017) 9 <https://www.oecd-ilibrary.org/content/publication/9789264272453-en>.

[2] For further elaboration, see Chapter 3 of this dissertation.

*Digitalization and data-driven innovation*

For some decades now, infrastructure management has undergone a process of digitalization as the result of the application of Information Communication Technologies (ICT), which has added a technological layer on top of the physical infrastructure for the purposes of monitoring and control.[3] More recently, with the growing availability of technologies such as sensors, smart metering, smart grids and data analytics techniques, infrastructure managers in the utilities sector can obtain improved and (near-to) real-time data about the functioning of the networks they manage and about the usage of drinking water and electricity. The data in question concern both so-called "industrial data" (also known as non-personal data) such as asset data or data concerning the commodity or service in question (e.g., voltage of electricity or pressure and quality of drinking water), as well as personal data (e.g., consumption data when the customer is a natural person).

These data can be used to measure consumption more accurately, to improve the design of physical infrastructures, pinpoint failures, predict the need for maintenance, enhance demand management, among others.[4] The creation of 'data labs', 'innovation playgrounds' and other data-related initiatives by infrastructure managers show that there is an interest in using data to develop innovative and more efficient ways to fulfil their legal tasks.[5] Thus, digitalization allows infrastructure managers to engage in what the OECD has named 'data-driven innovation', i.e., the "significant improvement of existing, or the development of new, products, processes [and] organizational methods" made possible through the analysis of large volumes of data.[6]

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[3] Mark de Bruijne, 'Networked Reliability. Institutional Fragmentation and the Reliability of Service Provision in Critical Infrastructures' (PhD Dissertation, Delft University of Technology 2006) 39 <http://rgdoi.net/10.13140/RG.2.1.2970.9046> accessed 10 November 2018.

[4] Chapters 2 and 3 of this dissertation elaborate on this. For a comprehensive study on digitalization and its impact on the management of infrastructure in multiple network industries, see Juan Montero and Matthias Finger (eds), A Modern Guide to the Digitalization of Infrastructure (Edward Elgar Publishing 2021) <https://www.e-elgar.com/shop/gbp/a-modern-guide-to-the-digitalization-of-infrastructure-9781839106040.html>.

[5] In the Netherlands see e.g., the data labs of Rijkswaterstaat (roadways and waterways) and ProRail (railways), the "Innovation Playground" of the drinking water company Vitens, and initiatives such as SmartPort led by the Port of Rotterdam. See for Rijkswaterstaat: Computable, 'Rijkswaterstaat transformeert met eigen datalab' (Computable) <https://www.computable.nl/artikel/informatie/awards-nieuws/6174387/1853296/rijkswaterstaat-transformeert-met-eigen-datalab.html> accessed 13 July 2022. For ProRail: ProRail, 'ProRail DataLab: voorspellen is voorkomen' (ProRail, 6 June 2017) <https://www.prorail.nl/nieuws/prorail-datalab-voorspellen-is-voorkomen> accessed 18 May 2019. For SmartPort: SmartPort, 'About Us - SmartPort' <https://smartport.nl/en/over-ons/> accessed 13 July 2022. For Vitens' Innovation Playground: 'Vitens Innovation Playground' (Smart Water For Europe) <https://sw4eu.com/vitens/> accessed 13 July 2022.

[6] OECD, 'Data-Driven Innovation: Big Data for Growth and Well-Being' (OECD Publishing 2015) 17 <https://doi.org/10.1787/9789264229358-en>.growth and well-being. It aims to improve the evidence bases on the role of data-driven innovation (DDI

The incorporation of digital technologies and the growing reliance on data for the management of infrastructures in the utilities sector bring about changes in the way infrastructure managers have traditionally performed their tasks. Firstly, besides making investments to maintain and expand the physical networks, infrastructure managers need to invest in ICT solutions and expertise in data science. Secondly, becoming data-driven requires that infrastructure managers collect large amounts of (near-to-real-time) data from different sources, including data generated by consumers (e.g., by means of smart meters).

Considering that utilities are highly regulated sectors that were not data-driven from the outset, it can be questioned whether existing regulatory frameworks governing those sectors are still fit-for purpose, or if changes are necessary to deal with the new dynamics introduced by digitalization and data-driven innovation. While this question has been extensively investigated for the electricity sector,[7] there is, as of yet, a limited understanding of the implications of digitalization and data-driven innovation for the regulation of the drinking water sector. There are important differences between the electricity sector and the drinking water sector, for instance, in terms of market structure (drinking water is produced and supplied by vertically integrated water utilities, while in the electricity sector the production, transport and supply are unbundled), experience with adoption of digital technologies (lower in the drinking water sector compared to the electricity sector) and regulatory landscape (lower degree of EU harmonization in the drinking water sector compared to the electricity sector). Considering these factors, digitalization and data driven innovation may give rise to distinct regulatory challenges in the drinking water sector that deserve separate exploration.

### 1.1.2. Infrastructure managers meet the EU data economy

The increased availability of data enabled by digitalization in the utilities sector does not only present opportunities to improve the execution of the tasks of infrastructure managers. The data collected or produced by infrastructure managers for the purposes

[7] See e.g., Anna Butenko, 'Sharing Energy: Dealing with Regulatory Disconnection in Dutch Energy Law' (2016) 7 European Journal of Risk Regulation 701 <https://www.jstor.org/stable/24890928> accessed 12 July 2022; Saskia Lavrijssen and Arturo Carrillo Parra, 'Radical Prosumer Innovations in the Electricity Sector and the Impact on Prosumer Regulation' (2017) 9 Sustainability 1207 <https://www.mdpi.com/2071-1050/9/7/1207> accessed 8 October 2020; Saskia Lavrijssen, Anna Marhold and Ana Trias, 'The Changing World of the DSO in a Smart Energy System Environment: Key Issues and Policy Recommendations' (CERRE 2016) <https://cerre.eu/publications/changing-world-dso-smart-energy-system-environment/> accessed 12 July 2022; Nicolò Rosetto and Valerie Reif, 'Digitalization of the Electricity Infrastructure: A Key Enabler for the Decarbonization and Decentralization of the Power Sector' in Juan Montero and Matthias Finger (eds), A Modern Guide to the Digitalization of Infrastructure (Edward Elgar Publishing 2021) <https://doi.org/10.4337/9781839106057> accessed 28 January 2022.

of monitoring, operating, and maintaining their assets can also be used by third parties as input to develop or improve products or services. This derives from the fact that data are non-rivalrous (in the sense that multiple actors can hold the same dataset) and non-excludable by default (in the sense that data can be easily shared), and that once data have been obtained, the cost of their reproduction tends to be zero.[8]

For example, Distribution System Operators in the energy sector hold datasets comprising (smart) meter data, grid data and market data, which can be re-used by third parties to offer new energy services to consumers, develop new tools for grid management and facilitate the energy transition.[9] Given the strategic value of the data collected in the utilities sector, EU policymakers have started to show interest in stimulating (and sometimes mandating) the sharing of these data.

This is evidenced in particular by the adoption of the Open Data Directive and the Recast Electricity Directive in 2019. The Open Data Directive (Directive (EU) 2019/1024)[10] is a recast of the Directive 2003/98/EC on the re-use of public sector information (known as the 'PSI Directive').[11] The so-called 'PSI regime' contains minimum harmonizing rules facilitating the re-use of public sector information in the EU. One of the novelties of the Open Data Directive is that it brings data held by public undertakings active in the utilities sector[12] under the scope of the PSI regime.

The Directive (EU) 2019/944 on common rules for the internal market for electricity (known as 'the Recast Electricity Directive'),[13] introduced provisions that require parties responsible for managing consumer data (typically Distribution System Operators) to give access to these data to eligible parties (such as energy suppliers and providers of energy services), following the rules for data management and exchange that must be laid down by each Member State.

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[8] Luciano Floridi, Information: A Very Short Introduction (Oxford University Press 2010) 30 <http://ebookcentral.proquest.com/lib/uvtilburg-ebooks/detail.action?docID=737413> accessed 3 February 2020; Rob Kitchin, 'Conceptualising Data', The Data Revolution: Big Data, Open Data, Data Infrastructures & Their Consequences (SAGE Publications Ltd 2014) 10 <http://methods.sagepub.com/book/the-data-revolution> accessed 12 April 2019.

[9] See e.g., E.DSO, 'E.DSO Policy Brief on Open Data' (EDSO 2018) <https://www.edsoforsmartgrids.eu/wp-content/uploads/EDSO-Open-Data-Policy-Brief_1812_final-1.pdf> accessed 13 July 2022.

[10] Directive (EU) 2019/1024 of the European Parliament and of the Council of 20 June 2019 on open data and the re-use of public sector information (2019) OJ L 172, 56.

[11] Directive 2003/98/EC of the European Parliament and of the Council of 17 November 2003 on the re-use of public sector information (2003) OJ L 345, 90.

[12] Gas, heat, electricity, drinking water, as well as different kind of transport services and postal services. See Chapter 5 of this dissertation.

[13] Directive (EU) 2019/944 of the European Parliament and of the Council of 5 June 2019 on common rules for the internal market for electricity and amending Directive 2012/27/EU, OJ L 158, 125.

These two legal regimes that seek to promote access to and re-use of data from the utilities sector are part of the broader system of rules adopted with the ambition of fostering the data economy and creating a single market for data in the EU. The next section elaborates on this point.

*The growing interest in regulating data use and data sharing in the European Union*

The potential of data-driven innovation is not only visible in the utilities sector. There are many other sectors that have increasingly become digitalized and data-driven, starting from governments and other public authorities, as well as other sectors such as mobility, healthcare, agriculture, financial services, and manufacturing. Considering that data have become a crucial input for many (economic) activities, there is a growing interest of EU policymakers in regulating how data are used and shared.

Since 2014, the European Commission has set out to facilitate a data-driven economy in the EU.[14] To this end, the European Commission has launched several initiatives, with the ultimate goal of creating the conditions for a European single market for data, in which data can flow within and across sectors, while respecting "European rules and values, in particular personal data protection, consumer protection legislation and competition law".[15] From a legal perspective, the main goal of the Commission has been creating the appropriate regulatory environment for the data economy, by means of removing unnecessary legal barriers, updating outdated legal frameworks and enhancing trust by trying to reduce or eliminate legal uncertainty.

One of the landmarks of this effort was the adoption in 2016 of the General Data Protection Regulation ('GDPR'),[16] which overhauled the regime introduced by the 1995 Data Protection Directive. The legal basis of the GDPR is found in Article 16 of the Treaty on the Functioning of the European Union (TFEU). This Article "mandates the European Parliament and the Council to lay down the rules relating to the protection of natural persons with regard to the processing of personal data and the rules relating to the free movement of personal data."[17] Hence, the GDPR has a dual objective: safeguarding the right to protection of personal data (fundamental

[14] European Commission, 'Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions "Towards a Thriving Data-Driven Economy"' (European Commission 2014) COM/2014/0442 final.

[15] European Commission, 'Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions "A European Strategy for Data"' (European Commission 2020) COM/2020/66 final 5 <https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX%3A52020DC0066>.

[16] Regulation (EU) 2016/679 of the European Parliament and of the Council of 27 April 2016 on the protection of natural persons with regard to the processing of personal data and on the free movement of such data, and repealing Directive 95/46/EC (General Data Protection Regulation), OJ L 119, 1.

[17] Recital 12, GDPR.

right dimension), as well as facilitating the free movement of personal data (internal market dimension).[18]

The GDPR applies to the processing of personal data,[19] i.e., information relating to an identified or identifiable natural person (data subject),[20] in all sectors, unless explicitly excluded by the Regulation itself.[21] The GDPR introduces several obligations and principles that must be observed by data controllers and data processors[22] when processing personal data. In addition, the Regulation grants various rights to data subjects in respect of their personal data.

Within the broader aim of regulating how data can be used to the benefit of the economy and society, special attention has been given in EU law and policy to data sharing in recent years. **'Data sharing'** is understood in this dissertation as making data held by one or more organization(s) (the data holder(s)) "available for re-use by other parties outside that organization (data re-users); where re-use can be understood as the use of data for commercial or non-commercial purposes other than the initial purpose for which data were produced".[23] This is a broad notion of data sharing, that encompasses both voluntary data sharing and data sharing following a specific legal obligation (e.g., when the law grants a specific right to access and re-use data).

At the root of the growing interest in regulating data sharing is an issue of insufficient availability of data, which prevents that the full potential of the data economy can be reached in the EU.[24] To tackle this issue, the European Commission has put forward several communications and legislative proposals in order to enable and facilitate data sharing, and some of them have already resulted in adopted legislation.

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[18] See Hielke Hijmans, 'Article 1 Subject-Matter and Objectives' in Christopher Kuner, Lee A Bygrave and Christopher Docksey (eds), The EU General Data Protection Regulation (GDPR): A Commentary (Oxford University Press 2020) <https://oxford.universitypressscholarship.com/10.1093/oso/9780198826491.001.0001/isbn-9780198826491-book-part-3> accessed 24 May 2022.

[19] Processing personal data refers to any operations performed on personal data, including making personal data available to others (e.g., by transmission or dissemination). For the full definition of 'processing', see Article 4(2) GDPR.

[20] For the full definition of personal data, see Article 4(1) GDPR.

[21] See Article 2 of the GDPR for the material scope of the Regulation.

[22] For the legal definitions of 'controller' and 'processor', see Article 4(7) GDPR and Article 4(8) GDPR:.

[23] This definition appears originally in Brenda Espinosa Apráez, 'Reconsidering the Public-Private Data Dichotomy in the European Union's Data Sharing Policies' (2021) 12 European Journal of Law and Technology <https://ejlt.org/index.php/ejlt/article/view/825>. The article is reproduced in this dissertation in Chapter 5. See Chapter 5 for further details on the sources on which this definition of data sharing is based.

[24] In its 2020 Communication 'A European strategy for data', the European Commission highlighted that '[c]urrently there is not enough data available for innovative re-use, including for the development of artificial intelligence.' European Commission, 'A European Strategy for Data, COM/2020/66 Final' (n 15) 6.

In 2018, the Commission published its communication 'Towards a common European data space',[25] along with the proposal to review the abovementioned PSI Directive, and a Staff Working Document on "Guidance on sharing private sector data in the European data economy".[26] Later that same year, the European Parliament and the Council adopted Regulation (EU) 2018/1807 on a framework for the free flow of non-personal data in the European Union.[27]

In 2020, the European Commission published its Communication 'A European strategy for data',[28] announcing different initiatives to continue fostering data sharing to overcome the issues of insufficient data availability in the EU. The initiatives included legislative measures and the creation of "common European data spaces" in strategic sectors such as energy, mobility, manufacturing, health, financial services, and public administration,[29] which will have their own regulations.

As part of the legislative measures announced in the EU Data Strategy, in November 2020 the European Commission published a proposal for a Regulation on European data governance (known as the 'Data Governance Act').[30] The Data Governance Act (Regulation EU 2022/868)[31] was finally adopted on May 30, 2022, and it introduced rules applicable to the re-use of certain types of data held by public sector bodies normally not accessible due to confidentiality, intellectual property rights and personal data protection restrictions, as well as rules for providers of data intermediation services and data altruism.

In February 2022, a proposal for a Regulation on harmonized rules on fair access to and use of data (known as the 'Data Act') was put forward by the Commission.[32] The

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[25] European Commission, 'Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions "Towards a Common European Data Space"' (2018) COM(2018) 232 final <https://eur-lex.europa.eu/legal-content/en/TXT/?uri=CELEX%3A52018DC0232>.

[26] European Commission, 'Commission Staff Working Document "Guidance on Sharing Private Sector Data in the European Data Economy"' (2018) SWD(2018) 125 final <https://eur-lex.europa.eu/legal-content/EN/TXT/?qid=1539766272141&uri=CELEX%3A52018SC0125>.

[27] Regulation (EU) 2018/1807 of the European Parliament and of the Council of 14 November 2018 on a framework for the free flow of non-personal data in the European Union, OJ L 303, 59–68.

[28] European Commission, 'A European Strategy for Data, COM/2020/66 Final' (n 15).

[29] For the full list and a short description of each data space, see the EU Data Strategy, in particular its Appendix (p. 26 onwards).

[30] European Commission, 'Proposal for a Regulation of the European Parliament and of the Council on European Data Governance (Data Governance Act) COM/2020/767 Final' (2020) <https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX%3A52020PC0767>.

[31] Regulation (EU) 2022/868 of the European Parliament and of the Council of 30 May 2022 on European data governance and amending Regulation (EU) 2018/1724 (Data Governance Act) OJ L 152, 1–44.

[32] European Commission, 'Proposal for a Regulation of the European Parliament and of the Council on Harmonised Rules on Fair Access to and Use of Data (Data Act) COM(2022) 68 Final.' (2022) <https://eur-

proposed Data Act will introduce rules for the sharing of data held by businesses in three fronts: creating an obligation for manufacturers or providers of connected products and services that generate data to give access to such data to the user of the product or service (or to a third party as requested by the user); laying down the conditions that should be applied by data holders legally obliged to share data with others; introducing an obligation for data holders to make data available to public sector entities on the basis of an exceptional need.

In addition to legislation targeting data as the main object of regulation, rules concerning data sharing can also be found as part of sectoral market regulation, with the aim of enabling complementary services.[33] This is the case of the above referred Recast Electricity Directive, as well as other sectoral regimes for data sharing, e.g., in the automotive sector[34] and the financial sector.[35]

To summarize, there is a growing interest in stimulating data sharing to foster the data economy in the EU, and multiple legal frameworks have been enacted and proposed to this end. The resulting picture is that the norms applicable to data sharing in the EU are scattered in different legal frameworks, depending, among other factors, on the type of data at stake (e.g., personal and non-personal data) or the public or private nature of the data holder and data recipient. In addition, the legal regimes applicable to data sharing are encompassed by horizontal legal frameworks that have data as the object of regulation (such as the GDPR or the proposed DGA), as well as sectoral data sharing regimes that do not have data per se as their regulatory target, but create or specify data sharing obligations (e.g., the Recast Electricity Directive).

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lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:52022PC0068&from=EN> accessed 7 July 2022.

33 Inge Graef, Jasper van den Boom and Martin Husovec, 'Spill-Overs in Data Governance: Uncovering the Uneasy Relationship Between the GDPR's Right to Data Portability and EU Sector-Specific Data Access Regimes' (2020) 9 Journal of European Consumer and Market Law 3 <https://kluwerlawonline.com/journalarticle/Journal+of+European+Consumer+and+Market+Law/9.1/EuCML2020002>.

34 See in this regard Wolfgang Kerber, 'Data Governance in Connected Cars: The Problem of Access to In-Vehicle Data' (2019) 9 Journal of Intellectual Property, Information Technology and Electronic Commerce Law 310 <https://www.jipitec.eu/issues/jipitec-9-3-2018/4807> accessed 24 May 2022; Bertin Martens and Frank Mueller-Langer, 'Access to Digital Car Data and Competition in Aftermarket Maintenance Services' (2020) 16 Journal of Competition Law & Economics 116 <https://doi.org/10.1093/joclec/nhaa005> accessed 13 July 2022.

35 See Oscar Borgogno and Giuseppe Colangelo, 'Data, Innovation and Competition in Finance: The Case of the Access to Account Rule' (2020) 31 European Business Law Review <http://kluwerlawonline.com/JournalArticle/European+Business+Law+Review/31.4/EULR2020023> accessed 14 April 2022.

The regulation of data sharing has become a topical subject in legal scholarship, as evidenced by the publication of several journal articles,[36] books[37] and research reports[38] on this topic in recent years. Most of this scholarship addresses data sharing from the perspective of the regulation of digital markets, data protection law, competition law, or discussions on the need to create new rights to control and access data in the context of the data economy. In existing literature concerning the regulation of data sharing, little or superficial attention is given to the sharing of data from the utilities sector. There is limited understanding of the implications of the convergence of horizontal legal frameworks targeted primarily targeted primarily at regulating data and the sharing thereof, with the regimes for data sharing introduced as part of the market regulation of the utilities sector. In addition, there is a lack of literature that examines critically the implications of traditional distinctions between public and private sector data for the regulation of data sharing in sectors such as the utilities, where the presence of and interaction between public and private actors is particularly strong.

## 1.2. Research question and research scope

Summarizing the knowledge gaps identified in the previous section, on the one hand, there is a limited understanding of the regulatory challenges brought

[36] See e.g., the special issue on 'Governing Data as a Resource' published by the journal Technology and Regulation in 2020, in particular: Charlotte Ducuing, 'Beyond the Data Flow Paradigm': [2020] Technology and Regulation 57 <https://techreg.org/index.php/techreg/article/view/49>; Michael Madison, 'Tools for Data Governance' [2020] Technology and Regulation 29 <https://techreg.org/index.php/techreg/article/view/45>; Teresa Scassa, 'Designing Data Governance for Data Sharing': [2020] Technology and Regulation <https://techreg.org/index.php/techreg/article/view/51>. See also Heiko Richter and Peter R Slowinski, 'The Data Sharing Economy: On the Emergence of New Intermediaries' (2019) 50 IIC- International Review of Intellectual Property and Competition Law 4 <http://link.springer.com/10.1007/s40319-018-00777-7> accessed 7 May 2019.

[37] Thomas Tombal, Imposing Data Sharing Among Private Actors : A Tale of Evolving Balances (Kluwer Law International 2022) <https://search.ebscohost.com/login.aspx?direct=true&db=nlebk&AN=3166621&site=ehost-live>; Bundesministerium der Justiz und für Verbraucherschutz and Max-Planck-Institut für Innovation und Wettbewerb (eds), Data Access, Consumer Interests and Public Welfare (Nomos Verlagsgesellschaft mbH & Co KG 2021) <https://www.nomos-elibrary.de/index.php?doi=10.5771/9783748924999> accessed 10 May 2021; Sebastian Lohsse, Reiner Schulze and Dirk Staudenmayer, Trading Data in the Digital Economy: Legal Concepts and Tools (Nomos Verlagsgesellschaft 2017) <http://ebookcentral.proquest.com/lib/uvtilburg-ebooks/detail.action?docID=5519730> accessed 7 April 2020.

[38] See e.g., Richard Feasey and Alexandre de Streel, 'Data Sharing for Digital Markets Contestability: Towards a Governance Framework' (CERRE 2020) <https://cerre.eu/publications/data-sharing-digital-markets-competition-governance/> accessed 11 May 2022; Bertin Martens and others, 'Business-to-Business Data Sharing: An Economic and Legal Analysis' (European Commission 2020) JRC Technical Report JRC Digital Economy Working Paper 2020-05 <https://joint-research-centre.ec.europa.eu/system/files/2020-07/jrc121336.pdf> accessed 9 September 2020.

by digitalization in the utilities sector, in particular in the management of infrastructure in the drinking water sector. On the other hand, there is limited study and understanding of the challenges that result from the convergence between the rules that govern the utilities sector (market rules) and the rules that govern the use and flow of data applicable to, but not specifically designed for, the utilities sector.

Against this background, the research question that this dissertation sets out to address is the following: **What are the regulatory challenges of data-driven innovation and data sharing in the context of the digitalized utilities, and what are possible ways to deal with these challenges?**

*Two interrelated lines of inquiry*

To address the proposed research question, the research presented in this dissertation pursues two interrelated lines of inquiry. The first line of inquiry focuses on investigating the **regulatory challenges that arise from the growing collection and use of data by infrastructure managers in the utilities sector** owing to the implementation of technologies such as sensors, smart meters and data analytics techniques. The point of departure of this line of inquiry is that data-driven innovation changes significantly the way in which infrastructure managers have traditionally performed their tasks, bringing opportunities as well as risks.

The scope of this part of the research is twofold: on the one hand, it investigates what are the implications of data-driven innovation for infrastructure managers in the utilities sector, in terms of their roles and the legal frameworks they have to comply with. On the other hand, it investigates whether and why it might be necessary to revise, also in light of regulatory developments at the European level, the existing regulatory frameworks of the utilities sector, in order to deal with the new possibilities of action enabled by the increasing adoption of digital technologies and the collection and analysis of large amounts of data. The studies presented in **Chapters 2 and 3** of this dissertation develop this first line of inquiry.

The second, closely related, line of research focuses on **the challenges of regulating data sharing in the EU, following from an examination of the legal frameworks applicable to the sharing of data from the utilities sector.** This line of inquiry follows from the first one and builds upon the premise that data collected by infrastructure managers in the utilities sector to improve the execution of their tasks can also be reused by other actors for innovative purposes. This has been acknowledged and fostered by recent EU legislation, namely, the above-mentioned Recast Electricity Directive and the Open Data Directive, which introduced data sharing obligations and/or specific conditions that must be applied when sharing data from the utilities

sector. These two pieces of legislation are examined in this thesis as part of the broad and complex system of rules adopted and proposed to stimulate data sharing as a building block of the data economy in the EU. This system of rules is formed by horizontal and sectoral legal frameworks and differentiated regimes for data sharing depending on the public or private nature of data holders and re-users.

Against this background, the scope of this second line of inquiry is two-fold: firstly, it examines what challenges arise from regulating the sharing of data from the utilities sector with intersecting horizontal and sectoral legal frameworks. Secondly, it examines the challenges of regulating data sharing beyond strict distinctions between public and private sector data. The studies presented in **Chapters 4 and 5 develop** this second line of inquiry.

By pursuing these analytically distinct yet strongly related lines of inquiry, this dissertation provides a comprehensive analysis of legal frameworks that apply to infrastructure managers from the drinking water and electricity sectors, as well as to the data they collect. This analysis results in the identification of multiple challenges for infrastructure managers, EU and national policymakers and national supervisory authorities, as well as in the formulation of suggestions to tackle those challenges.

*Academic relevance*

The research presented in this dissertation relies on and contributes to two broad strands of research, namely, economic regulation studies and law and technology studies. Research on economic regulation examines whether and how regulation is or should be used as an instrument to intervene in economic activities to address market failures and achieve socially desirable outcomes.[39] Within the realm of economic regulation, my research pertains concretely to the prominent subfield of regulation of the utilities sector, also known as network industries.[40]

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[39] Decker (2014) defines 'economic regulation' as "interventions which, among other things, impact on the structure of an industry (for example, by restricting the number of firms that can be involved in the supply of a service, requiring separate entities to undertake different activities in a supply chain, o requiring that access to infrastructure facilities be provided to third parties), or which attempt to guide or control de behaviour of firms in terms of their decisions in respect of pricing, investment, quality and coverage of service, as well as the terms on which access is provided to other firms, including competitors". Christopher Decker, Modern Economic Regulation: An Introduction to Theory and Practice (Cambridge University Press 2014) <https://www.cambridge.org/core/books/modern-economic-regulation/2E685357F7A567D19B4F13EC71A0C2B8> at 1.1.

[40] See e.g. Leigh Hancher and Pierre Larouche, 'The Coming of Age of EU Regulation of Network Industries and Services of General Economic Interest' in Paul Craig and Gráinne De Búrca (eds), The evolution of EU law (Second edition, Oxford University Press 2011); Robert Baldwin, Martin Cave and Martin Lodge, Understanding Regulation: Theory, Strategy, and Practice (Oxford University Press, Incorporated 2012)

On the other hand, my research also builds upon law and technology scholarship. Recurrent themes in law and technology literature include investigating whether and why the emergence of new technologies requires changes in existing legal frameworks, as well as the (enabling or limiting) effects of law on technological innovation.[41] My research pertains in particular to the subfield of law and technology studies that examines how the law responds to the opportunities, risks and dilemmas created by the collection and use of unprecedented amounts of data. Certain authors have started to use the expression "Data Law" or "Big Data Law" to refer to this area of the law and the study thereof.[42] This is a relatively new field of law and legal research, that started to consolidate during the years of my PhD trajectory, following the adoption of multiple legal frameworks that have data (and the sharing thereof) as the main object of regulation, as summarized in section 1.1.2. My research contributes to open new frontiers in this emerging area, as will be explained next.

By investigating the regulatory challenges of data-driven innovation and data sharing in the digitalized utilities, my research advances economic regulation and law and technology scholarship in the following ways. Firstly, it develops new knowledge on the impact of digitalization on the regulation of the utilities sector. As noted in Section 1.1. of this Chapter, existing legal scholarship on this topic focuses mostly on the electricity sector. My research expands current knowledge by investigating the regulatory challenges that arise from the adoption of digital technologies in another key but understudied sector, namely, the drinking water sector. As noted above, this sector has its own market structure, regulations and sociotechnical context which give rise to distinct regulatory challenges that deserve separate investigation.

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<http://ebookcentral.proquest.com/lib/uvtilburg-ebooks/detail.action?docID=829488> accessed 6 July 2022; Decker (n 39); Wolf Sauter, Public Services in EU Law (Cambridge University Press 2014) <https://www.cambridge.org/core/books/public-services-in-eu-law/389513AE12521CB05824B0B372B26876>.

41 Roger Brownsword and Karen Yeung (eds), Regulating Technologies : Legal Futures, Regulatory Frames and Technological Fixes (Hart Publishing 2008) <https://www.bloomsburycollections.com/book/regulating-technologies-legal-futures-regulatory-frames-and-technological-fixes>; Morag Goodwin, Bert-Jaap Koops and Ronald Leenes, Dimensions of Technology Regulation (WLP 2010); Roger Brownsword, Eloise Scotford and Karen Yeung, 'Law, Regulation, and Technology' (The Oxford Handbook of Law, Regulation and Technology, 20 July 2017) <https://www-oxfordhandbooks-com.tilburguniversity.idm.oclc.org/view/10.1093/oxfordhb/9780199680832.001.0001/oxfordhb-9780199680832-e-1> accessed 25 March 2022; Ronald Leenes, 'Of Horses and Other Animals of Cyberspace: Editorial' (2019) 2019 Technology and Regulation 1 <https://techreg.org/article/view/10997> accessed 4 November 2022.

42 See Vanessa Mak, Eric Tjong Tjin Tai and Anna Berlee (eds), Research Handbook in Data Science and Law (Edward Elgar Publishing 2018) <http://search.ebscohost.com/login.aspx?direct=true&db=nlebk&AN=1982665&site=ehost-live>; Thomas Streinz, 'The Evolution of European Data Law', The Evolution of EU Law (3rd edn, Oxford University Press 2021) <https://oxford.universitypressscholarship.com/10.1093/oso/9780192846556.001.0001/oso-9780192846556-chapter-29> accessed 10 November 2021; Roland Vogl (ed), Research Handbook on Big Data Law (Edward Elgar Publishing 2021) <https://www-elgaronline-com.tilburguniversity.idm.oclc.org/view/edcoll/9781788972819/9781788972819.xml> accessed 9 November 2022.

Secondly, my research goes beyond the state of the art of legal research concerning the regulation of data. Existing scholarship in this area has so far focused predominantly on state actors (in areas such as law enforcement[43] or in the context of smart cities[44]), or private actors in sectors that are data-driven from the outset, such as digital platforms.[45] This dissertation expands current knowledge on the challenges that the growing 'datafication'[46] brings for the law, by studying and bringing insights from a sector that has thus far remained largely understudied in law and technology literature focusing on the regulation of data, namely, the utilities sector. In the utilities sector, public, semi-public and private actors are present and interact with each other. This raises new challenges, for instance, regarding the private or public nature of the data collected in the utilities sector and the consequences that this has in terms of the applicable legal frameworks for data sharing. As explained later in this dissertation, the lines between public and private sector data are becoming blurred and data sharing regulation in the EU has yet to acknowledge that.

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[43] See e.g., Rosamunde Van Brakel and Paul De Hert, 'Policing, Surveillance and Law in a Pre-Crime Society: Understanding the Consequences of Technology Based Strategies' (2011) 20 Technol. Led Policing 165; Orla Lynskey, 'Criminal Justice Profiling and EU Data Protection Law: Precarious Protection from Predictive Policing' (2019) 15 International Journal of Law in Context 162 <https://www.cambridge.org/core/journals/international-journal-of-law-in-context/article/criminal-justice-profiling-and-eu-data-protection-law-precarious-protection-from-predictive-policing/10FD4B64364191B619FBCB864CD40A7F> accessed 13 July 2022; Sascha van Schendel, 'The Challenges of Risk Profiling Used by Law Enforcement: Examining the Cases of COMPAS and SyRI' in Leonie Reins (ed), Regulating New Technologies in Uncertain Times (TMC Asser Press 2019) <https://doi.org/10.1007/978-94-6265-279-8_12> accessed 13 July 2022.

[44] See e.g., Sofia Ranchordás and Abram Klop, 'Data-Driven Regulation and Governance in Smart Cities' [2018] Research Handbook in Data Science and Law 245 <https://www.elgaronline.com/view/edcoll/9781788111294/9781788111294.00018.xml> accessed 13 July 2022; Sofia Ranchordás, 'Citizens as Consumers in the Data Economy: The Case of Smart Cities' (2018) 7 Journal of European Consumer and Market Law <https://kluwerlawonline-com.tilburguniversity.idm.oclc.org/journalarticle/Journal+of+European+Consumer+and+Market+Law/7.4/EuCML2018032> accessed 13 July 2022; Maša Galič, 'Surveillance and Privacy in Smart Cities and Living Labs: Conceptualising Privacy for Public Space' (Doctoral Thesis, Tilburg University 2019) <https://research.tilburguniversity.edu/en/publications/surveillance-and-privacy-in-smart-cities-and-living-labs-conceptu>

[45] See e.g., Inge Graef, EU Competition Law, Data Protection and Online Platforms : Data as Essential Facility (Wolters Kluwer 2016); Nicolas Petit, Big Tech and the Digital Economy: The Moligopoly Scenario (Oxford University Press 2020) <https://oxford.universitypressscholarship.com/10.1093/oso/9780198837701.001.0001/oso-9780198837701> accessed 13 July 2022; Björn Lundqvist, 'How Does the EU Protect Competition in the Digital Platform Economy?' in Antonina Bakardjieva Engelbrekt and others (eds), The European Union and the Technology Shift (Springer International Publishing 2021) <https://doi.org/10.1007/978-3-030-63672-2_5> accessed 27 June 2022.

[46] This term is used by Cukier and Mayer-Schoenberger to refer to the "ability to render into data many aspects of the world that have never been quantified before", Kenneth Cukier and Viktor Mayer-Schoenberger, 'The Rise of Big Data: How It's Changing the Way We Think about the World' (2013) 92 Foreign Affairs 28, 29 <https://heinonline.org/HOL/P?h=hein.journals/fora92&i=592> accessed 30 May 2022.

Finally, this dissertation presents a comprehensive overview and in-depth analysis of EU and Dutch legal frameworks that apply to the tasks performed by infrastructure managers in the drinking water and electricity sectors together with the legal frameworks governing the data collected in those sectors, identifying overlaps, gaps and uncertainties resulting from their interaction. The novelty of this approach is that it brings together two fields that are usually investigated separately: the regulation of network industries and the regulation of data. This dissertation shows how these two fields become interlinked as a consequence of digitalization in the utilities sector and the growing interest in stimulating access and re-use of data from these sectors in the context of the data economy. Moreover, this dissertation unveils the challenges that stem from this entwinement and the ways in which existing regulatory frameworks fall short when dealing with them and proposes ways to address such shortcomings.

## 1.3. Research setup

*The Longa Via Project*

The research presented in this thesis was carried out under the umbrella of the **LONGA VIA Project** (Legal & Organizational Network & Governance Aspects of Data-Driven Innovations in Infrastructure Management), funded by the Dutch Research Council (NWO) and the knowledge platform of Dutch infrastructure managers Next Generation Infrastructures (NGInfra).[47] The project was a collaboration between researchers from Tilburg Law School and Tilburg School of Economics and Management (TiSEM), and five Dutch infrastructure operators active in the drinking water, energy and transport sectors: the drinking water company Vitens, the regional distribution system operator Alliander, the Port Authority of the Port of Rotterdam, the executive agency for roads and waterways Rijkswaterstaat, and the manager of railway infrastructure ProRail. The LONGA VIA project aimed at investigating which legal and organizational factors affect the adoption of data-driven innovations in the Dutch infrastructure sector.

Two separate but interconnected PhD projects were set up to carry out the research. The legal part of the research corresponds to the PhD project presented in this thesis, and the organizational part of the research corresponds to the PhD project of Tom

[47] NWO, 'Legal & Organizational Network & Governance Aspects of Data-Driven Innovations in Infrastructure Management (LONGA VIA).' (NWO) <https://www.nwo.nl/en/projects/43916807> accessed 13 July 2022.

Aben, MSc (TiSEM).[48] Each PhD trajectory had its own research design, fitting their respective disciplines. The legal project had as its main object of study existing (and upcoming) legal frameworks applicable to the use and sharing of data in the utilities sector, in particular in the drinking water and electricity sectors. The organizational project had as its main object of study the organizations managing infrastructures in the transport and energy sectors, as well as their relationships with contractors and other actors in their network, and how they can more effectively utilize data and data-driven innovations.

The two PhD projects are complementary. The legal project adopted a macro-level perspective, examining the regulatory landscape as an important factor shaping how data are used and shared by infrastructure managers, especially considering that they operate in highly regulated sectors. The organizational project took micro-level perspective, investigating how to facilitate that infrastructure managers and actors in their network can design inter-organizational processes around data (sharing), digitalization and smart management and maintenance of infrastructures.

The fact that the legal and organizational projects took place in parallel and that both PhD researchers had regular contact made possible that the findings from each project could inform the findings from the other. My research informed the organizational project by identifying that there are multiple (overlapping) national and EU regulatory frameworks that affect the leeway that infrastructure managers have to take advantage of available data and data-driven innovations to achieve smarter management and maintenance of their infrastructure. Multiple legal frameworks apply to infrastructure managers and to the data they use, depending on factors such as their legal nature (public sector bodies or public undertakings), the type of data they process (personal or non-personal) and the economic sector in which they operate (drinking water, electricity, etc.). These regulatory frameworks encompass rules that in some cases enable or require, and in other cases limit or introduce conditions, for the collection and/or sharing of data. Hence, regulatory frameworks play an important role in the design of organizational processes to benefit from data driven innovation in the management of infrastructure.

Tom Aben's research for the organizational project informed my PhD project by providing insights on the importance of intra and interorganizational arrangements to facilitate the realization of public policy objectives.[49] Well-designed contracts between infrastructure managers and their contractors, as well as appropriate governance mechanisms between

[48] See Tom Aben's dissertation to be defended on December 2, 2022, Tom Antoon Elizabeth Aben, 'The (Long) Road towards Smart Management and Maintenance: Organising the Digital Transformation of Critical Infrastructures' (PhD Dissertation, Tilburg University 2022).

[49] See in particular Aben (n 48) Chapter 4.

infrastructure managers and other actors in their sectors are instrumental for the effective implementation of laws and policies stimulating data driven innovation and data sharing in the network industries. In addition, Tom's research brought interesting insights on how perceived legal barriers related to personal data protection rules affect how infrastructure managers make use of and share data.

*Cooperation with infrastructure managers*

The setup of the LONGA VIA project also made possible that I could cooperate and have regular contact with practitioners from the infrastructure managers acting as project partners, through exploratory (semi-structured) interviews, consortium meetings and other knowledge sharing activities. In addition, the infrastructure managers in the project provided access to their premises and to internal documents with the aim of supporting the research.

Although my research has as its main object of analysis and data source the legal frameworks that apply to the use and sharing of data in the selected sectors, the contact and cooperation with the LONGA VIA project partners played a fundamental role in delineating the scope of the research. It helped me to understand how data are being collected and used in the sectors under study, and the uncertainties and difficulties related to the use of data with which infrastructure managers have to deal in their daily practice. Each of the studies that form this dissertation was initially sparked by questions raised by the infrastructure managers in the project, as well as (legal) developments flagged by them as important in their respective sector. I used the topics raised by the project partners as the starting point to do a review of legal sources and literature that in turn allowed me to identify knowledge gaps in legal scholarship and formulate research questions for each of the studies that form this dissertation.

In addition, the contact and cooperation with the infrastructure operators allowed me to get rich insight into the roles they perform, how their respective sector is organized and regulated, and it helped me to identify other relevant actors in their sector (e.g., policymakers, supervisory authorities, consumers, other market parties). This allowed me to identify relevant regulatory frameworks to include in this study, and to get a sense of how those regulatory frameworks are applied in practice.

The LONGA VIA project started in the Spring of 2018 and ended in the Spring of 2022. The setup of the project significantly influenced the choice of the topics, legal frameworks and sectors that were investigated in my PhD trajectory, as will be explained in the following section.

## 1.4. Methodological approach

This dissertation is predominantly a work of legal scholarship. Legal scholarship is a field of research that has law (as a social domain or practice) as its subject matter.[50] To answer the research question that guides this dissertation, the methodological approach of doctrinal legal research was followed. In a nutshell, doctrinal legal research "provides a systematic overview of certain rules, analyses the relationships and coherence among rules, explains the law and its application, or evaluates rules by deducting their consequences."[51]

To be more specific, the studies that form this dissertation were conducted following the methodological approach of what certain scholars call doctrinal legal research "in a broad sense".[52] In a "narrow sense", doctrinal legal research (also known as traditional legal research) is limited to systematically describing and reconstructing positive law.[53] This entails, in the words of Smits, giving "a systematic exposition of the principles, rules and concepts governing a particular legal field or institution and [analyzing] the relationship between these principles, rules and concepts to solve unclarities and gaps in the existing law".[54] However, as acknowledged by Taekema, legal research is not only a descriptive discipline, but also a normative one.[55] This means that besides reconstructing the rules that govern a particular field, doctrinal legal research "in a broad sense" incorporates two additional objectives: evaluating existing legal frameworks and providing recommendations for legal reform.[56] All three aims of doctrinal legal research in a broad sense are present in my research, as will be shown throughout this dissertation.

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[50] Sanne Taekema, 'Relative Autonomy: A characterisation of the discipline of law.' in Bart van Klink and Sanne Taekema (eds), Law and method : interdisciplinary research into law (Mohr Siebeck 2011) 33.

[51] Geertrui Van Overwalle and Lina Kestemont, 'Science and Technology and Intellectual Property Research' in Irene Calboli and Maria Lillà Montagnani (eds), Handbook of Intellectual Property Research: Lenses, Methods, and Perspectives (Oxford University Press 2021) 447 <https://doi.org/10.1093/oso/9780198826743.003.0029> accessed 9 November 2022.

[52] Taekema (n 50) 34; Sanne Taekema and Wibren van der Burg, 'Introduction: The Incorporation Problem in Interdisciplinary Legal Research' [2015] Erasmus Law Review 39 <http://www.erasmuslawreview.nl/tijdschrift/ELR/2015/2/ELR-D-15-004_001> accessed 31 March 2022.

[53] Taekema and Burg (n 52) 39.

[54] Jan M Smits, 'What Is Legal Doctrine?: On The Aims and Methods of Legal-Dogmatic Research' in Edward L Rubin, Hans-W Micklitz and Rob van Gestel (eds), Rethinking Legal Scholarship: A Transatlantic Dialogue (Cambridge University Press 2017) 210 <https://www.cambridge.org/core/books/rethinking-legal-scholarship/what-is-legal-doctrine/D693F58F616ECA2F241ABA9B4BCB9518> accessed 13 July 2022.

[55] Taekema (n 50) 35.

[56] Taekema (n 50) 35.

As explained by van Hoecke, doctrinal legal research is an "empirical-hermeneutical discipline".[57] As such, this type of research consists in the interpretation of text and documents, mainly normative sources (legislation and other sources of law) and authoritative sources (e.g., case law and academic legal writings).[58] In this dissertation, these sources are analyzed following commonly used techniques of legal interpretation, namely textual, systematic (or contextual), teleological and historical interpretation. [59]

Considering the setup of the research and the proposed research question, in addition to legal sources and legal scholarship, this dissertation also relies on other sources, including academic literature from other disciplines, as well as non-academic documents published by relevant actors in the sectors under study. These sources are employed to explain what digitalization means, the technologies involved and their impact, and how data are collected and processed in the sectors under study, elements that are necessary to understand the sociotechnical context in which the legal frameworks (as main object of study) apply. The incorporation of extra-legal sources in this dissertation is justified because, as noted by Langbroek et al (2017), legal research requires not only knowledge about the traditional elements of the law, but also about other aspects, such as the (changing) societal and technological context.[60]

*Selection of Legal Sources*

As the reader will notice, each substantial chapter of this dissertation examines different legal sources. The main legal sources employed in this dissertation include EU and Dutch legislation and other legally binding instruments, preparatory documents and other public documents published by EU and Dutch policymakers and supervisory authorities, and a ruling from a Dutch court. There are chapters in which the focus lies mostly on EU legal sources (Chapters 2 and 5) and there are chapters that examine both Dutch and EU legal sources (Chapter 3 and 4). The choice of focusing in certain instances on the Dutch legal context relates to the setup in which my PhD trajectory took place, as part of the LONGA VIA project described above. The project was designed to conduct research in close cooperation with Dutch infrastructure managers, justifying the examination of Dutch legal frameworks. Nevertheless, in

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[57] Mark Van Hoecke, Methodologies of Legal Research: Which Kind of Method for What Kind of Discipline? (Bloomsbury Publishing Plc 2013) 3 <http://ebookcentral.proquest.com/lib/uvtilburg-ebooks/detail.action?docID=1772966> accessed 19 April 2021.

[58] Van Hoecke (n 57) 4,11.

[59] For further reading on legal interpretation techniques, see Lina Kestemont, Handbook on Legal Methodology: From Objective to Method (Intersentia 2018) <https://www.cambridge.org/core/books/handbook-on-legal-methodology/B957C53FFA068812AB435BD51890EDEC> accessed 9 November 2022.

[60] Philip Langbroek and others, 'Methodology of Legal Research: Challenges and Opportunities' (2017) 13 Utrecht Law Review 1, 1 <http://www.utrechtlawreview.org/articles/abstract/10.18352/ulr.411/> accessed 8 June 2022.

order to address the research question that guided this research, it was necessary to examine EU legislation and policy as well, because the regulation of data sharing is a topic that has an important EU law dimension, as discussed in section 1.1.2. of this Introduction. Each substantial chapter of this dissertation specifies the relevant legal sources and literature employed, and the steps taken to address the research question dealt with in each of the four studies here presented. Legal developments are followed up to October 31, 2022.

In this thesis, the analysis of legal frameworks applicable to the sharing of data from the utilities sector covers provisions applicable to the access and re-use of data for the purposes of commercial and non-commercial innovation. Obligations to provide information from these sectors to public authorities, among others, for the purposes of market supervision or law enforcement, are not covered in this dissertation.

*Selection of Sectors*

This thesis focuses on the digitalized utilities, in particular, the drinking water and electricity sectors. These two sectors are selected because they offer an interesting context to explore the regulatory challenges that arise from data-driven innovation and data sharing. Multiple legal frameworks are involved, starting with the sectoral market rules applicable to the provision of drinking water and electricity. In addition, since part of the data collected in the utilities sector can be traced back to natural persons (consumers), this triggers the application of personal data protection legislation. Lastly, it is often the case that drinking water and electricity are provided by public undertakings, and these entities have as of 2019 been included in the EU legislation for open data and the re-use of public sector information.

The multiple legal frameworks that must be taken into account when studying how data from the drinking water and electricity sectors should be used and shared results in a very complex regulatory landscape: the coexistence of different policy objectives, interaction of multiple actors with varying interests, multiple competent supervisory authorities with different perspectives and priorities, give rise to new and urgent questions for researchers, policymakers and infrastructure managers, as will be shown in this dissertation.

The choice of focusing on the drinking water and electricity sectors also responds to the setup of my PhD research as part of the LONGA VIA project. As previously mentioned, the LONGA VIA project involved cooperation with Dutch infrastructure managers from different sectors, including electricity and drinking water.

The first substantial chapters (2 and 3) are devoted to the drinking water sector, and Chapter 4 is devoted to the electricity sector. The choice to focus on the drinking water sector in the first two chapters, responds to the absence of research on the regulatory challenges of digitalization and data-driven innovation in that sector. This lack of research might be explained by the fact that, unlike in the electricity sector, in the drinking water sector there has not been an explicit legislative encouragement or mandate to embrace digitalization and rollout technologies such as smart meters. However, as will be shown in Chapters 2 and 3, there is a growing interest by water utilities to incorporate these smart water meters and other digital technologies, to tackle issues of water scarcity and improve the management of drinking water infrastructures. This offers room to investigate the implications of those technologies and the growing availability of data that they enable for the regulation of the drinking water sector.

As my PhD trajectory progressed, the regulation of data sharing became more important in my research due to the attention that this topic has received by EU policymakers (as explained in section 1.1.2.), and the interest that the topic of data sharing sparked amongst the infrastructure managers in the LONGA VIA project. The choice to focus on the electricity sector in Chapter 4 is justified because data sharing and the regulation thereof has, as of yet, a more prominent role in the electricity sector, compared to the drinking water sector. This might be explained by the different market structures of these two sectors. In the drinking water sector, the abstraction, treatment, and supply of drinking water are usually carried out by vertically integrated (local) water utilities. In addition, digitalization and value added services for consumers on the basis of smart meter data are less pervasive in the drinking water sector than in the electricity sector.[61]

In contrast, due to the market structure of the electricity sector shaped by unbundling requirements introduced by EU law, this sector encompasses multiple actors active in different parts of the value chain (generation, transmission, supply, added value services). In this context, the exchange of data between the different actors has a very important role to ensure the correct functioning of the market and to make possible the offer of new energy services to consumers.[62] This has been acknowledged by the Recast Electricity Directive adopted in 2019, which introduced provisions requiring Member States to lay down rules for access to consumer data. This offered an interesting

[61] See Chapter 2 of this thesis and Guido Cervigni and Pierre Larouche, 'Regulating Smart Metering in Europe: Technological, Economic and Legal Challenges' (CERRE 2014) Report of a CERRE project 20 <https://cerre.eu/wp-content/uploads/2020/07/140331_CERRE_SmartMetering_Final_0.pdf> accessed 11 October 2018.

[62] See Chapter 4 of this thesis.

scenario to examine the interplay between this sectoral data sharing regime and the GDPR as a horizontal legal framework having a direct impact on the sharing of consumers' personal data in the electricity sector (Chapter 4).

## 1.5. Societal relevance

The societal relevance of this research stems from both its aims and setup. Regarding the aims, being an exercise of doctrinal legal research 'in a broad sense', this research analyzes existing regulatory frameworks and identifies multiple challenges (in the form of gaps, overlaps, uncertainties and shortcomings) and offers suggestions to tackle those challenges, with the ultimate aim of contributing to develop more consistent and fit-for purpose (interpretations of) legal frameworks. Besides, due to the practice orientation that characterizes doctrinal legal research,[63] the questions here investigated are not only relevant from an academic perspective, but also have implications for the roles of policymakers, supervisory authorities and infrastructure managers in sectors of vital importance for society (drinking water and electricity).

Furthermore, this research delivered societal impact through the cooperation with the five infrastructure managers that participated in the LONGA VIA project. Findings were shared with them as the research progressed, mainly through consortium meetings that were held three to four times per year, as well as other knowledge dissemination activities organized by the researchers of the LONGA VIA team, the project partners and NGInfra. These knowledge dissemination activities helped to increase awareness among the infrastructure managers of the different legal frameworks that need to be observed when collecting and sharing data, as well as pinpointing certain misconceptions around legal concepts, such as "ownership" in respect of data.[64] The societal impact of the LONGA VIA project was acknowledged by its nomination to the Tilburg University Impact Award in 2021.

## 1.6. Outline of the thesis

This thesis consists of a collection of four separate but interrelated academic writings (one book chapter and three research articles) that were produced during my PhD trajectory (2018-2022). Each of them corresponds to one substantial chapter

[63] See among others, Taekema (n 50).

[64] See the article Brenda Espinosa Apráez and Saskia Lavrijssen, 'Van Wie Zijn Data Eigenlijk?' (2019) 2019 (3) NGinfra Magazine 44 <https://issuu.com/nginframagazine/docs/infra_03-2019_mr/44>.

of this thesis. Three of these four scholarly writings (corresponding to Chapters 2, 4 and 5) are single-authored and only one of them is co-authored. The latter refers to Chapter 3 of this dissertation, which corresponds to an article written together with one of my supervisors. I am the principal author of this article, and, for the sake of transparency, I proceed to specify the respective contributions of the co-authors: Saskia Lavrijssen and I contributed to the conceptualization (i.e., ideas and formulation of overarching research questions and aims) of the article. I was responsible for the methodology, investigation, analysis and writing of the original draft. The review and preparation of the article for publication were done by both co-authors. Saskia Lavrijssen was responsible for supervision and funding acquisition.

The writings mirrored in Chapters 2, 3 and 5 have been already published, while Chapter 4 corresponds to the manuscript of an article that has been accepted for publication in the Journal of Energy & Natural Resources Law (currently in press).[65] Chapters 1 and 6 (Introduction and Conclusions), are original text written for this dissertation. Except for minor linguistic or format editing, the text of the published articles and book chapter mirrored in Chapters 2, 3 and 5 has remained unaltered. In Chapter 5, a new section has been added to the original text of the published article with an update on relevant legislative developments and a reflection on their significance for the findings of that Chapter. In some cases, the citation style of the original published version has been changed, so that a single citation style (OSCOLA) is used in the thesis.

The remainder of this thesis is structured as follows. **Chapters 2 and 3** are focused on the first line of inquiry identified in section 1.2. of this Introduction, namely, the **regulatory challenges that arise from the growing collection and use of data by infrastructure managers in the utilities sector.** In particular, **Chapter 2** deals with digitalization and infrastructure management in the drinking water sector. It provides an overview of smart water technologies and investigates how they are changing the management of infrastructures in the drinking water sector. Furthermore, it explores what kinds of (legal) challenges arise from the growing digitalization of this sector and the roles of regulation and policy in this transformation. **Chapter 3** explores the regulatory challenges of introducing smart water meters in the Netherlands. Relying on law and technology literature, the Chapter explains why the introduction of smart water meters might require adjusting regulations of the Dutch drinking water sector to deal with the new possibilities of action enabled by this technology.

[65] Brenda Espinosa Apráez, 'The Challenges of Sharing Data at the Intersection of EU Data Protection and Electricity Market Legislation: Lessons from the Netherlands.' [Forthcoming] Journal of Energy & Natural Resources Law. Accepted on 31 October 2022. The published version includes minor revisions after peer review.

**Chapters 4 and 5** focus on the second line of inquiry, i.e., **the challenges of regulating data sharing in the EU, following from an examination of the legal frameworks applicable to the sharing of data from the utilities sector. Chapter 4** studies the interplay between the provisions for access to consumer data introduced by the Recast Electricity Directive and the General Data Protection Regulation (GDPR). In particular, this chapter analyzes a case from the Dutch electricity sector and extracts learnings that can help Member States to improve the substantive alignment between these two frameworks and enhance cooperation between energy regulators and data protection authorities. **Chapter 5** examines one of the dichotomies around which the European Commission has built its policies to facilitate and stimulate data sharing as a key element of a thriving data economy: the public-private sector data dichotomy. The chapter investigates the assumptions underlying this dichotomy and whether they still hold under the current dynamics of data production. Moreover, it proposes starting points to advance academic and policy debates on how to regulate data sharing beyond the limitations of this dichotomy.

**Chapter 6** presents the conclusions, academic and practical implications of this research, as well as avenues for further research.

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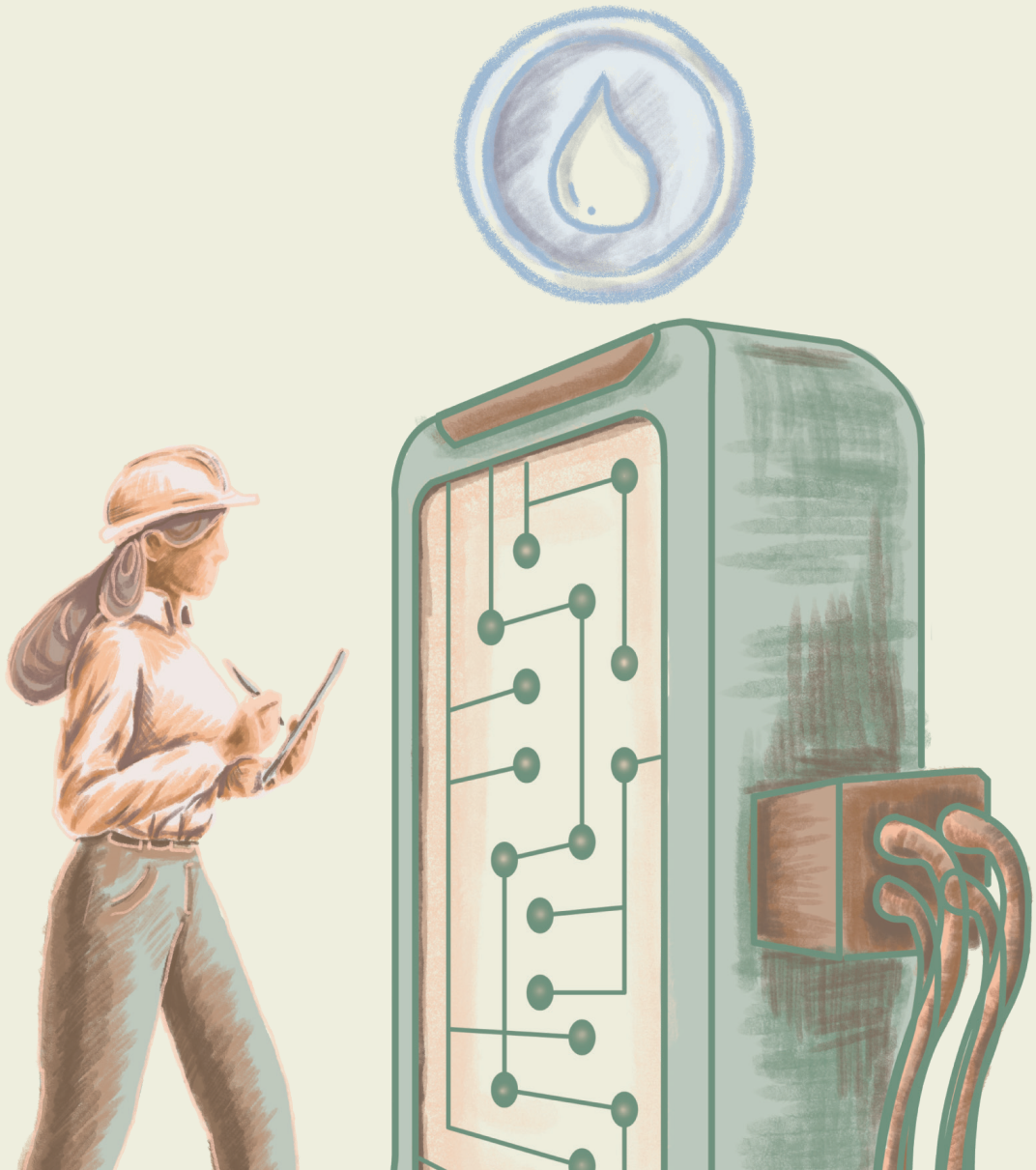

# CHAPTER 2

# Digitalization in the drinking water sector: Towards smart water supply

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## 2.1. Introduction

Water supply is one of the most critical network industries, given its direct link with basic human needs. As recognized by the General Assembly ofthe United Nations in 2010, the right to safe and clean drinking water (and sanitation) is "a human right that is essential for the full enjoyment of life and all human rights".[2] According to the Committee on Economic, Social and Cultural Rights of the United Nations, there are three basic factors that underlie the right to water that states should guarantee: availability, quality and accessibility.[3] Availability refers to the sufficient and continuous supply of water for personal and domestic uses. Quality entails that water should be free from micro-organisms, chemical substances and radiological hazards that threaten human health, and should be of an acceptable color, odor and taste. Accessibility means that water services should be accessible to everyone in four dimensions: physical accessibility, economic accessibility (affordability), non-discriminatory access, and information accessibility.[4]

Due to the indispensable nature of water services, ensuring availability and sustainable management of water and sanitation is one of the goals (number 6) on the UN 2030 Agenda for Sustainable Development.[5]Achieving this goal does not come without challenges, as there are certain contextual factors that increasingly compromise the availability, quality and accessibility of water. First, the steady growth in global population and extreme weather conditions as a result of climate change, are raising concernsregarding water scarcity.[6] In addition, water infrastructures are aging and will require rehabilitation or replacement in the coming decades. According to estimations included in a report published by K-water approximately €20 billion per year will be necessary to keep distribution networks in Europe in good condition, calling for prioritization and optimization of investments in the sector. [7] Moreover, pollution of ground and surface water sources as a result

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[2] United Nations, 'Resolution Adopted by the General Assembly on 28 July 2010 64/292. The Human Right to Water and Sanitation' (2010) A/RES/64/292 <https://undocs.org/en/A/RES/64/292> Article 1.

[3] CESCR, 'General Comment No. 15 (2002), The Right to Water (Arts. 11 and 12 of the International Covenant on Economic, Social and Cultural Rights)' (UN, 2002) <http://digitallibrary.un.org/record/486454>.

[4] CESCR (n 3) 5.

[5] United Nations, 'Transforming Our World: The 2030 Agenda for Sustainable Development' (2015) <https://sustainabledevelopment.un.org/content/documents/21252030%20Agenda%20for%20Sustainable%20Development%20web.pdf> accessed 3 February 2020.

[6] Thomas Boyle and others, 'Intelligent Metering for Urban Water: A Review' (2013) 5 Water 1052, 1053 <https://www.mdpi.com/2073-4441/5/3/1052> accessed 5 February 2020; David A Lloyd Owen, *Smart Water Technologies and Techniques: Data Capture and Analysis for Sustainable Water Management* (John Wiley & Sons, Incorporated 2018) <http://ebookcentral.proquest.com/lib/uvtilburg-ebooks/detail.action?docID=5296145> accessed 31 October 2019 Ch. 2.

[7] 'Smart Water Management: Case Study Report' (2018) 428 <https://www.iwra.org/swmreport/> accessed

of industrial and agricultural activities and inadequate sanitation are worsening the quality of water for human consumption.[8] Additionally, climate change has a negative impact on water quality, due to higher water temperatures and the pollution risks associated with flooding and drought.[9]



The provision of drinking water is carried out by public or private organizations known as "water utilities," which are in charge of abstracting, treating and distributing water for human consumption, and managing the infrastructures therein involved. The need to obtain more precise and timely informationto tackle the abovementioned challenges has motivated water utilities to embrace digitalization. This has been facilitated by the fact that advanced sensing tools and computing capabilities are increasingly available at a cost that, conversely, tends to decrease.[10]

This chapter outlines key aspects of the growing digitalization of the drinking water sector and discusses how this approach is changing the management of the infrastructures therein involved. Furthermore, it explores the challenges that accompany this transformation, and the roles of regulation and policy as enablers of or obstacles to digitalization. The remainder of this chapter is organized as follows: Section 2.2 provides an overview of the technologies behind the digitalization of the drinking water sector. Section 2.3 discusses the impact of digitalization on the management of drinking water infrastructures and other aspects of drinking water supply. Section 2.4 is dedicated to exploring possible changes in market structure in the sector under study as a result of digitalization. Section 2.5 refers to the challenges brought about by digitalization, in particular those relevant from a policy perspective. Section 2.6 discusses the role of regulation and other policies in the path toward digitalization of the drinking water sector. The conclusions of this chapter are presented in Section 2.7.

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28 January 2020.

8 See Nandita Singh, 'Introduction' in Nandita Singh (ed), *The Human Right to Water: From Concept to Reality* (Springer International Publishing 2016) 4 <https://doi.org/10.1007/978-3-319-40286-4_1> accessed 5 October 2020; United Nations, 'SDG 6 Synthesis Report 2018 on Water and Sanitation' (United Nations 2018) 141 <https://www.unwater.org/publications/highlights-sdg-6-synthesis-report-2018-on-water-and-sanitation-2/> accessed 5 October 2020.

9 UNESCO World Water Assessment Programme, 'The United Nations World Water Development Report 2020: Water and Climate Change - UNESCO Digital Library' (UNESCO 2020) 1 <https://unesdoc.unesco.org/ark:/48223/pf0000372985.locale=en> accessed 5 October 2020.

10 Sven Eggimann and others, 'The Potential of Knowing More: A Review of Data-Driven Urban Water Management' (2017) 51 Environmental Science & Technology 2538, 5 <https://pubs.acs.org/doi/10.1021/acs.est.6b04267> accessed 20 January 2020; Lloyd Owen (n 6) 76; Khoi A Nguyen and others, 'Re-Engineering Traditional Urban Water Management Practices with Smart Metering and Informatics' (2018) 101 Environmental Modelling & Software 256, 257 <http://www.sciencedirect.com/science/article/pii/S1364815217305893> accessed 30 January 2020.

## 2.2. The technologies behind digitalization in the drinking water sector

The term "smart water management" is commonly used to encapsulate the digitalization of the drinking water sector.[11] Therefore, this expression will be used interchangeably with 'digitalization' in the remainder of this chapter. Smart water management is understood as the use or integration of information communication technologies (ICT) in water management.[12] As noted by a report from the International Telecommunication Union (ITU), smart water management encompasses an array of technologies that allow for data acquisition and integration, modeling and analytics, data dissemination, data processing and storage, management and control, and visualization and decision support.[13]

In its 2014 report, ITU classifies smart water management tools in six main categories, with possible overlapping areas. These categories are shown in Table 1.

**Table 1 Types of smart water management tools**

| Category | Examples |
|---|---|
| Data acquisition and integration | Sensor networks, smart pipes, smart meters |
| Modeling and analytics | "MikeURBAN" |
| Data dissemination | Radio transmitters, WiFi, Internet |
| Data processing and storage | Cloud computing |
| Management and control | SCADA, optimization tools |
| Visualization and decision support | Web-based communication tools |

Source: the author, based on International Telecommunication Union (2014, p. 4).

It is beyond the scope of this chapter to provide a detailed description of all the technologies used for smart water management, but the most commonly cited examples will be outlined.

[11] See e.g. K-water (n 7); Lloyd Owen (n 6).

[12] Gye Woon Choi and others, 'SWMI: New Paradigm of Water Resources Management for SDGs' (2016) 1 Smart Water 1, 2 <https://doi.org/10.1186/s40713-016-0002-6> accessed 8 November 2019; International Telecommunication Union, 'Partnering for Solutions: ICTs in Smart Water Management' (2014) 4 <https://www.itu.int/dms_pub/itu-t/oth/0b/11/T0B110000253301PDFE.pdf> accessed 3 February 2020; K-water (n 7) 25.

[13] International Telecommunication Union (n 12) 4.

### 2.2.1. Smart Water Metering

Smart water meters are the most obvious and intuitive example of digitalization in the drinking water sector. This is not surprising because they are the technology that people (consumers of drinking water) are most likely to encounter.[14] Smart meters are not only used in the water sector. In fact, their use is more prevalent in the energy sector (electricity and gas). In Europe, this is due largely to the existence of European Union legislation that mandates the roll-out of smart meters in the energy sector.[15] In contrast, there are no European Union-wide policies that explicitly encourage a broad adoption of smart meters by water utilities.

Although there is no agreed definition for this type of technology, in general terms, smart meters are "a component of the smart grid that allows a utility to obtain meter readings on demand (daily, hourly or more frequently) without the need of manual meter readers to transmit information".[16] Smart water meters differ greatly from so-called "dumb" (mechanical accumulation) meters. While the latter require manual readings taken usually once or twice per year, smart water meters allow for more frequent, higher resolution and remotely accessible (consumption) data.[17]

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[14] Lloyd Owen (n 6) 86.

[15] For the electricity sector, this was first introduced by Directive 2009/72/ EC of The European Parliament and of The Council of 13 July 2009 (Annex 1, para- graph 2). The 2009 Directive was recast in 2019 by Directive (EU) 2019/944 of the European Parliament and of the Council of 5 June 2019 on common rules for the internal market for electricity and amending Directive 2012/27/EU. The provisions concerning the deployment of smart metering can be found mainly in Articles 19–21 and Annex II.

[16] Elio Arniella, 'Evaluation of Smart Water Infrastructure Technologies (SWIT)' (Inter-American Development Bank 2017) 15 <https://publications.iadb.org/publications/english/document/Evaluation-of-Smart-Water-Infrastructure-Technologies-(SWIT).pdf> accessed 5 February 2020.

[17] Boyle and others (n 6); Hug March and others, 'Household Smart Water Metering in Spain: Insights from the Experience of Remote Meter Reading in Alicante' (2017) 9 Sustainability 2 <https://www.mdpi.com/2071-1050/9/4/582> accessed 5 February 2020.

The possibilities enabled by smart water meters are summarized by Espinosa Apráez and Lavrijssen (2018, p. 162)[18] as follows:

- precise consumption measurement, reducing billing errors and disputes with consumers;
- monitoring the water system in a timely manner;
- easing and lowering the cost of meter reading (avoiding manual reading);
- providing precise data to balance water demand;
- facilitating prompt leak detection in consumer premises or other parts of the network (e.g., analyzing information generated from a building or a block);
- prompt detection of theft or other causes of water loss;
- creating awareness about water conservation and facilitating enforcement of local water restrictions;
- applying dynamic prices; and
- additional features may also enable to measure water quality parameters, such as temperature or pressure.

The literature usually distinguishes between two types of smart meters: (1) automated meter reading (AMR), and (2) automated or advanced metering infrastructure (AMI).[19] AMR was the first approach to make water meters smarter. Mechanical ("dumb") meters were "complemented with a system with datalogger and communication equipment, which allows readings to be taken using portable equipment (walk-by) or using vehicles (drive-by) which circulate through the streets of a city, scanning the nearby meters".[20] AMI goes one step further and allows for two-way communication between the meter and the utility, making possible meter readings that are sent directly to the utility.[21] Some authors report that only AMI can be truly considered smart metering, to the extent that what makes metering "smart" is the connection of the meter to the communication network.[22] Other authors consider as true smart metering only the evolved versions of AMI, which allow for real-time communication using private communication networks combined with a new generation of meters, so-called interval water meters.[23]

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[18] Brenda Espinosa Apráez and Saskia Lavrijssen, 'Exploring the Regulatory Challenges of a Possible Rollout of Smart Water Meters in the Netherlands' (2018) 19 Competition and Regulation in Network Industries 159, 162 <https://doi.org/10.1177/1783591719829421>.

[19] See e.g. Arniella (n 16); Boyle and others (n 6); Lloyd Owen (n 6).

[20] Víctor Sempere-Payá, David Todolí-Ferrandis and Salvador Santonja-Climent, 'ICT as an Enabler to Smart Water Management' in Subhas C Mukhopadhyay and Alex Mason (eds), *Smart Sensors for Real-Time Water Quality Monitoring*, vol 4 (Springer Berlin Heidelberg 2013) 248–249 <http://link.springer.com/10.1007/978-3-642-37006-9_11> accessed 8 November 2019.

[21] Arniella (n 16) 15; Sempere-Payá, Todolí-Ferrandis and Santonja-Climent (n 20) 249.

[22] Boyle and others (n 6); Lloyd Owen (n 6).

[23] Sempere-Payá, Todolí-Ferrandis and Santonja-Climent (n 20) 249.

### 2.2.2. Sensor Networks

As mentioned in the Introduction to this chapter, guaranteeing the quality of drinking water is a paramount obligation of states and water utilities. Drinking water quality is assessed against certain standards related, e.g., to microbiological, chemical and organoleptic parameters. Globally, the best-known standards are the guidelines prepared by the World Health Organization.[24] In the European Union, drinking quality standards are set by Council Directive 98/83/EC on the quality of water intended for human consumption,[25] known as the Drinking Water Directive. The monitoring of water quality has been traditionally carried out by collecting samples at given points of the network with a certain periodicity, which are then analyzed in a laboratory to assess whether they meet the relevant standards. This approach has its limitations: it does not allow for real-time monitoring of the quality of water (i.e., there is a time gap between sampling and detection of contamination), the samples are taken at a small number of locations, and it is labor-intensive.[26]

Sensor networks can contribute to mitigate these limitations. They entail the installation of different types of wireless sensors inside the water pipes, to measure in real-time parameters such as temperature, conductivity, pH, pressure, turbidity, dissolved oxygen, etc.[27] The data collected by these sensors are sent to the utility which then can take prompt action if there is a threat of contamination. The data can also be used to create models to predict changes in the water quality and/or the need of pipe maintenance, and to optimize water treatment processes.[28]

### 2.2.3. District Metered Areas

District metered areas (DMAs) are a method of measuring water loss that consists in dividing the water distribution network into several subsystems, where water

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[24] The latest (and fourth) edition of the Guidelines for Drinking Water Quality (GDWQ) was officially adopted in 2011, but there is a version published in 2017 that incorporates an addendum to the fourth edition World Health Organization, 'Guidelines for Drinking-Water Quality, 4th Edition, Incorporating the 1st Addendum' (World Health Organization 2017) <https://apps.who.int/iris/bitstream/handle/10665/254637/9789241549950-eng.pdf;jsessionid=0510CD20281F394CE4FBFB99C0A7A9E3?sequence=1> accessed 5 October 2020.

[25] Council Directive 98/83/EC of 3 November 1998 on the quality of water intended for human consumption, OJ L 330, pp. 32–54. Note after publication of the book chapter mirrored here: Directive 98/83/EC will be repealed and replaced by Directive (EU) 2020/2184 on the quality of water intended for human consumption (recast), OJ L 435, pp. 1–62, with effect from 13 January 2023.

[26] Theofanis P Lambrou and others, 'A Low-Cost Sensor Network for Real-Time Monitoring and Contamination Detection in Drinking Water Distribution Systems' (2014) 14 IEEE Sensors Journal 2765, 2765.

[27] Marco Carminati and others, 'A Self-Powered Wireless Water Quality Sensing Network Enabling Smart Monitoring of Biological and Chemical Stability in Supply Systems' (2020) 20 Sensors 1125 <https://www.mdpi.com/1424-8220/20/4/1125> accessed 5 October 2020; Lambrou and others (n 26).

[28] Carminati and others (n 27) 4.

supply and consumption are measured individually from the rest of the system.[29] A combination of several tools is employed (hardware and software), including (smart) water meters, geographical information systems, different types of sensors (pressure, temperature, etc.), hydraulic models and algorithms.

DMAs can be used to identify deviations from normal flows and pressures, enhancing pressure management and pinpointing of leakages along the distribution network.[30] Some reports refer to further subdivisions within DMAs, which, with the help of smart meter data, can help to find leakage points, not only in the distribution network but also at the home of the consumer.[31]

### 2.2.4. Modeling

Developing models and algorithms based on the data collected with smart meters and other sensing technologies can help water utilities on several fronts. For example, hydraulic modeling can be used for pipe network analysis, which is useful in planning future infrastructure expansion and validating the design of new or rehabilitated pipelines.[32] Modeling can be also used to predict changes in water quality in the distribution network, caused by different factors (chemical or biological, loss of system integrity, etc.).[33] Another use of modeling in the management of drinking water infrastructure is forecasting water demand, which is often a difficult task considering that water demand is subject to daily, weekly and seasonal variations, and in addition is affected by external factors (e.g., socio-economic and meteorological).[34]

### 2.2.5. Supervisory Control and Data Acquisition

Supervisory control and data acquisition (SCADA) is a technology that enables the remote monitoring of a system or parts of it and, by means of processing information, it can generate reports or alarms useful for operation and maintenance.[35] In the management of water systems, and with the help of sensors and other data-collecting devices, SCADA can monitor and control various assets and processes from source to tap.[36]

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[29] Arniella (n 16) 18.

[30] Arniella (n 16) 20.

[31] K-water (n 7) 93.

[32] Arniella (n 16) 28.

[33] Arniella (n 16) 29.

[34] Michele Romano and Zoran Kapelan, 'Adaptive Water Demand Forecasting for near Real-Time Management of Smart Water Distribution Systems' (2014) 60 Environmental Modelling & Software 265, 265 <http://www.sciencedirect.com/science/article/pii/S1364815214001819> accessed 6 February 2020.

[35] J Temido, J Sousa and R Malheiro, 'SCADA and Smart Metering Systems in Water Companies. A Perspective Based on the Value Creation Analysis' (2014) 70 Procedia Engineering 1629, 1631 <http://www.sciencedirect.com/science/article/pii/S1877705814001829> accessed 6 February 2020.

[36] Arniella (n 16) 27; Temido, Sousa and Malheiro (n 35) 1634.

The previous paragraphs have provided a brief description of some of the most common technologies used for smart water management in the drinking water sector. The list is far from exhaustive, since there are many other technologies such as geographic information systems or visualization technologies (e.g., digital twins) that have been and continue to be developed. All these technologies have in common that they allow for obtaining better-quality data about the condition and functioning of infrastructures and the quality of the drinking water. Having more accurate and (near-to) real-time data allows infrastructure managers to perform better assessments of the present situation, minimizing service disruptions and damage to the infrastructures, as well as predicting and preparing for future scenarios.

## 2.3. The impacts of digitalization in the drinking water sector

Specific figures that reflect widespread cost savings or efficiency increases as a consequence of digitalization in the drinking water sector are scarce and scattered in academic literature. In a 2017 literature review of data-driven urban water management, Eggiman et al. (2017) note that "clear evidence for a beneficial cost-benefit ratio that would justify widespread implementation of a more data-driven [urban water management] is generally missing." [37] However, in "gray literature" such as industry reports or handbooks it is possible to find references to successful case studies.[38]

This lack of substantial evidence in academic literature is explained by different factors. Firstly, it might be too soon to evaluate the actual impact of digitalization on the management of drinking water infrastructure. On the one hand, some sources note that even if digitalization is growing in the water sector, the level of maturity is still low regarding "the integration and standardization of ICT solutions, their business processes and the related implementation in the legislative framework".[39] Moreover, the degree of openness to innovation is lower in this sector, compared to energy or telecommunications.[40] This is partly motivated by the risk aversion and institutionally conservative approach that characterize the water sector, rooted in the public health and environmental concerns linked to the provision of drinking water.[41]

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[37] Eggimann and others (n 10) 33.

[38] See e.g., K-water (n 7); Lloyd Owen (n 6).

[39] Gabriel Amilcar Anzaldi Varas and ICT4Water, 'Digital Single Market for Water Services Action Plan' (European Commission 2018) 34 <https://www.ict4water.eu/wp-content/uploads/2019/04/ict4wateractionplan2018.pdf> accessed 7 February 2020.

[40] Lloyd Owen (n 6) 58.

[41] Lloyd Owen (n 6) 9.

On the other hand, the benefits of smart water management usually become visible after several years and many projects are still ongoing or were recently completed. For example, in a case study of smart water management in the city of Seosan (South Korea), a smart metering program was put in place in June 2016 and projections indicate that net benefits will become visible after about four years.[42] Another factor that explains the absence of clear figures regarding the impact of digitalization in the sector under study is that the benefits of more data are difficult to foresee and improvements such as greater flexibility are hard to measure.[43] Even if more evidence of the specific impact of adopting smart water management technologies has yet to come, there are already sources that report on the potential of digitalization to transform and improve the management of drinking water infrastructure and drinking water supply, as will be shown in the following paragraphs.

### 2.3.1. Impact on Design of Infrastructures

Improved water consumption data, obtained primarily with smart water meters, can help utilities to design and plan the upgrading of their infrastructures in a way that reflects the actual needs of the system. Daily demand profiles and peaking factors (e.g., peak hour and peak day) are necessary information to plan and design infrastructures such as pumps, pipes and storage reservoirs.[44] While traditional methods to obtain such variables usually rely on assumptions and outdated information resulting in infrastructure that is overdesigned, smart water metering allows for high resolution and up-to-date data that can be used to model water demand more accurately.[45] For example, in a study carried out by Gurung et al. (2014), the peak day consumption modeled using smart meter data was 12 percent lower than the one assumed by the water utility.[46]

More accurate information about the actual needs of the system prevents unnecessary overdesign of infrastructure and upgrades or expansion can be avoided or delayed if full capacity has not yet been reached.

### 2.3.2. Impact on the Monitoring and Maintenance of Infrastructures

Digitalization has also the potential of transforming the maintenance of the drinking water infrastructure. Water utilities face an important challenge, considering that a large part of their assets is located underground, making the monitoring more

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[42] K-water (n 7) 102.

[43] Eggimann and others (n 10) 30.

[44] Thulo Ram Gurung and others, 'Smart Meters for Enhanced Water Supply Network Modelling and Infrastructure Planning' (2014) 90 Resources, Conservation and Recycling 34, 34 <http://www.sciencedirect.com/science/article/pii/S0921344914001347> accessed 6 February 2020; Nguyen and others (n 10) 258.

[45] Gurung and others (n 44) 34.

[46] Gurung and others (n 44).

difficult and expensive. Adopting smart water management approaches can help drinking water utilities to tackle that challenge in a number of ways. For example, the use of smart water metering and (sub)DMAs helps to pinpoint leakages in the water mains and also at the home of the customer (see Section 2.2.3). Remote acoustic sensing is another technique that helps in detecting leaks, thereby avoiding manual inspections which are more labor-intensive and usually less timely.[47] With the use of these technologies, water utilities can find and address leakages faster, reducing service disruptions and non-revenue water (i.e., water that is put into the water network but does not reach the customer and thus is not billed).[48]

Smart water management techniques can also help infrastructure managers in determining more accurately when their assets require maintenance or replacement. In traditional approaches, infrastructures are managed following assumed operating lifetimes, rather than on the basis of their actual condition.[49] The advent of digitalization and more data-driven approaches have made possible the development of models that allow the prediction of failures in the water infrastructure, such as pipe deterioration.[50] This opens the door to abandon corrective or preventive maintenance methods and move toward more condition-based or even predictive maintenance approaches.

In sum, digitalization allows for better monitoring and timelier (not-too-soon, not-too-late) maintenance of drinking water infrastructure. As a result, major disruptions can be prevented and investments in rehabilitation or replacement can be avoided or deferred.

### 2.3.3. Impact on Water Demand Management

Water demand management is an approach to managing water resources that aims to "develop and implement strategies to manage supply more efficiently, as well as enact water conservation measures and drought response plans when

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[47] Lloyd Owen (n 6) 130.

[48] Rudolf Frauendorfer and Roland Liemberger, 'The Issues and Challenges of Reducing Non-Revenue Water' (Asian Development Bank 2010) 5 <https://www.adb.org/sites/default/files/publication/27473/reducing-nonrevenue-water.pdf>.

[49] Lloyd Owen (n 6) 50.

[50] Zhidong Li and Yang Wang, 'Domain Knowledge in Predictive Maintenance for Water Pipe Failures' in Jianlong Zhou and Fang Chen (eds), *Human and Machine Learning: Visible, Explainable, Trustworthy and Transparent* (Springer International Publishing 2018) <https://doi.org/10.1007/978-3-319-90403-0_21> accessed 9 February 2020; Daniel Winkler and others, 'Pipe Failure Modelling for Water Distribution Networks Using Boosted Decision Trees' (2018) 14 Structure and Infrastructure Engineering 1402 <https://doi.org/10.1080/15732479.2018.1443145> accessed 9 February 2020.

needed".[51] Considering the increase in population and the risks of water scarcity exacerbated by climate change, water demand management policies are becoming increasingly relevant to secure sufficient availability of drinking water. Water demand management includes several aspects, such as engineering, economic and other types of incentives, enforcement and education.[52] Smart water technologies play an important role in making water demand management possible and effective.

For example, with the help of smart metering, water utilities can have more detailed insights into water consumption trends. This information can be also shared with customers by means of visualization tools, in order to increase awareness and stimulate water savings, especially in peak hours or during dry periods.[53] Smart meters are also crucial in implementing dynamic pricing or time-of-use tariffs as economic incentives to implement water demand management policies. Examples of application of such incentives are imposing penalty fees for exceeding a certain threshold of water consumption, especially during dry seasons, or providing periodic incentives to lower consumption during peak hour.[54]

### 2.3.4. Other Impacts of Digitalization

So far, this section has discussed and provided examples of the impact of digitalization on the management of drinking water infrastructure in three main fronts: design of infrastructures, monitoring and maintenance of infrastructures, and management of water demand. However, there are other areas that can be also (positively) affected by digitalization in the drinking water sector. For example, smart water management approaches can contribute to save energy costs in the production and distribution of drinking water. [55] In this respect, Lloyd Owen refers to the possibility of optimizing the operation of pumps with the use of sensors that transmit pressure data and algorithms that determine in real time the required pressure within the distribution network at any given time.[56] Since pumps account for the largest share of energy consumption in a water distribution system, this form of pressure management helps to use pumps more efficiently thereby contributing to saving energy costs.

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[51] Nguyen and others (n 10) 256.

[52] Nguyen and others (n 10) 256.

[53] Temido, Sousa and Malheiro (n 35) 1637.

[54] Graham Cole and Rodney A Stewart, 'Smart Meter Enabled Disaggregation of Urban Peak Water Demand: Precursor to Effective Urban Water Planning' (2013) 10 Urban Water Journal 174, 193 <https://doi.org/10.1080/1573062X.2012.716446> accessed 21 January 2020; Nguyen and others (n 10) 258.

[55] Jiada Li, Xiafei Yang and Robert Sitzenfrei, 'Rethinking the Framework of Smart Water System: A Review' (2020) 12 Water 412, 14 <https://www.mdpi.com/2073-4441/12/2/412> accessed 8 October 2020.

[56] Lloyd Owen (n 6) 133.

Digitalization can also contribute to better monitoring of drinking water quality, as exemplified by the sensor networks discussed in section 2.2.2. Among others, real-time monitoring of water quality helps utilities to avoid over-using substances for treatment (e.g., chlorine), which improves the taste of the water and saves chemical costs.[57]

Finally, yet importantly, digitalization can enhance customer service and satisfaction.[58] For instance, as discussed throughout this chapter, smart water technologies can help utilities to detect and react more quickly to adverse events, thereby minimizing service disruption. In addition, as discussed in section 2.2.3, the use of DMAs and smart water metering allows internal leaks at consumers' homes to be pinpointed, which can be proactively notified by the utilities. Lastly, smart water metering allows for less disturbance of consumers (they do not need to be present for water meter readings or do not have to send the readings manually); and more detailed consumption information, which translates into more accurate billing and the possibility of adjusting water consumption to save on utility expenses.[59]

## 2.4. Possible changes in market structure (?)

One of the consequences of digitalization of network industries is the emergence of new actors in the market structure of each sector. A prominent example of these new actors are online platforms that enable coordination among different market players, as illustrated by Montero and Finger in their analysis of platformization in the telecommunications, transport and energy sectors.[60] In the electricity sector, new actors have emerged as a consequence of digitalization and decentralization.[61] A key example of this are "prosumers" (or active customers), which were included in the recently adopted Directive (EU) 2019/944 on common rules for the internal market for electricity. Active customers are defined by the said Directive as final customers that consume, store or sell self-generated electricity and/or participate in flexibility or energy efficiency schemes (Art. 2 (8)).

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[57] Lloyd Owen (n 6) 134.

[58] International Telecommunication Union (n 12) 13.

[59] Li, Yang and Sitzenfrei (n 55) 15.

[60] Juan José Montero and Matthias Finger, 'Platformed! Network Industries and the New Digital Paradigm' (2017) 18 Competition and Regulation in Network Industries 217 <https://doi.org/10.1177/1783591718782310> accessed 8 October 2020.

[61] See Saskia Lavrijssen and Arturo Carrillo Parra, 'Radical Prosumer Innovations in the Electricity Sector and the Impact on Prosumer Regulation' (2017) 9 Sustainability 1207 <https://www.mdpi.com/2071-1050/9/7/1207> accessed 8 October 2020.

Comparable significant changes in market structure are not evidenced in the drinking water sector. This might be related to the fact that, unlike in the case of other network industries, the provision of drinking water is usually vertically integrated, i.e., the abstraction, treatment and distribution of water to consumers are carried out by one water utility. In addition, it is unlikely that there will be prosumers in the drinking water sector due to health and water quality reasons and other resource-related limitations that make self-production of water much more difficult than self-production of electricity, for example. These characteristics of the drinking water sector leave little room for the emergence of new market actors as a result of digitalization.

What is feasible is the creation or expansion of markets for services based on the growing amount of data that water utilities collect with the help of smart technologies. As mentioned earlier, owing to digitalization, more data on water consumption and on the functioning and condition of infrastructures become available. Such data can be used by the utilities themselves to improve their processes, but the data can also be used to develop new products or services either by the same water utilities or by other service providers.

Examples of this are applications that help consumers to have better insight into their water consumption, save water, or adjust their consumption to benefit from time-of-use tariffs (see section 2.3.3). Another possibility enabled by digitalization in the drinking water sector and other sectors (e.g., energy, health and safety), is the development of smart home systems.[62] Smart home technologies "comprise sensors, monitors, interfaces, appliances and devices networked together to enable automation as well as localised and remote control of the domestic environment".[63] Providers of smart home solutions take advantage of the ICT embedded in home appliances (such as TVs, fridges, lighting and washing machines) and take it one step further to make the home as a whole "smart" and "link these smart homes into the meters, wires and pipes of the utility networks", [64] including water supply.

Another possible development that relies on the combination of data from water and other utilities is the advent of a so-called "digital multi-utility service

[62] OECD, *Enhancing Water Use Efficiency in Korea* (IWA Publishing 2017) 114 <http://ebookcentral.proquest.com/lib/uvtilburg-ebooks/detail.action?docID=5188255> accessed 17 July 2019.

[63] Tom Hargreaves and Charlie Wilson, 'Introduction: Smart Homes and Their Users' in Tom Hargreaves and Charlie Wilson (eds), *Smart Homes and Their Users* (Springer International Publishing 2017) 1 <https://doi.org/10.1007/978-3-319-68018-7_1>.

[64] Hargreaves and Wilson (n 63) 1.

provider".[65] This idea is still in an early phase of research, but it is interesting to examine it as a possible outlook of digitalization in the drinking water sector and other utilities. Digital multi-utility service providers would "collect a customers' medium-high resolution water, electricity and gas demand data and provide user-friendly platforms to feed this information back to customers and supply/distribution utility organisations".[66] With this combination of different streams of data, "digital multi-utilities" can harness the water–energy nexus. The "water–energy nexus" refers to the link between consumption of water and energy (electricity and gas). In domestic utilities consumption, this is evidenced, for example, in the use of energy for water heating.[67] The combination of data from different utilities would allow "digital multi-utilities" to create innovative tariff structures and tailored resource conservation products and rebates, and also manage peak demand in the different utilities, among other things.[68]



## 2.5. New challenges

Digitalization brings interesting opportunities to improve the processes involved in the provision of drinking water, but at the same time, it comes with challenges. Some of the most relevant challenges are discussed below.

### 2.5.1. Financial Challenges

Even if the cost of smart water technologies tends to decrease over time, the initial investments required to fully digitalize the management of drinking water infrastructures are high compared to less "smart" approaches. For example, deploying smart meters is more costly than traditional meters, not only because the metering devices are more expensive, but also because smart metering requires a communications infrastructure to operate.[69] Moreover, on top of the traditional investments for construction and maintenance of physical infrastructure, smart water management approaches require investing in technologies for the collection, communication, analysis and storage of data, which require upgrading and maintenance themselves.

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[65] Nguyen and others (n 10) 265; Rodney A Stewart and others, 'Integrated Intelligent Water-Energy Metering Systems and Informatics: Visioning a Digital Multi-Utility Service Provider' (2018) 105 Environmental Modelling & Software 94, 96 <http://www.sciencedirect.com/science/article/pii/S1364815217311271> accessed 5 June 2020.

[66] Nguyen and others (n 10) 265.

[67] Lloyd Owen (n 6) 94.

[68] Nguyen and others (n 10) 256; Stewart and others (n 65) 96.

[69] K-water (n 7) 99; Lloyd Owen (n 6) 87.

The higher costs involved, together with the fact that the expected benefits are often difficult to quantify or realize in the short term,[70] are still factors that prevent a broader uptake of digitalization in the drinking water sector. This is more challenging when utilities are only financed by the tariffs they charge to consumers, and the price of water is rather low.[71] Against that background, access to additional sources of financing, in particular public funding, seems to be very important to spur digitalization in the drinking water sector.[72]

### 2.5.2. Personal Data Protection and Privacy

As explained earlier, more accurate and near to real-time consumption data provided by smart meters are a key component of smart water management. At the same time, since smart meters are installed at the home of consumers and taking into account that the data they capture qualify as personal data, water utilities must pay close attention to the limitations and requirements arising from data protection and privacy legal regimes[73] (see in this regard Espinosa Apráez and Lavrijssen (2018))[74]. In the European Union, the most comprehensive legal framework concerning data protection (and to a lesser extent privacy), is the General Data Protection Regulation (EU) 2016/679 (known as the "GDPR"). This legislation establishes a set of requirements and principles that must be followed when personal data are processed.

Following the GDPR, "personal data" means "any information relating to an identified or identifiable natural person" (Art. 4 (1)).[75] Data generated by smart meters qualify as personal data to the extent that they contain information relating to an identifiable person. According to an opinion issued by the Article 29 Data Protection Working Party (a former European Union data protection advisory body), this is usually the case because data generated by smart meters are associated to unique identifiers,

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[70] Eggimann and others (n 10) 30.

[71] K-water (n 7) 99.

[72] K-water (n 7) 459–460.

[73] Although often used interchangeably, privacy and data protection are two different rights, at least in the European Union legal system. As explained by Dalla Corte (2018, p. 135), while privacy has a substantive nature (protecting private and family life, home and correspondence) data protection has a more formal nature (dictating rules and procedures for data processing to protect certain underlying rights), Lorenzo Dalla Corte, 'The European Right to Data Protection in Relation to Open Data' in Bastiaan van Loenen, Glenn Vancauwenberghe and Joep Crompvoets (eds), *Open Data Exposed* (TMC Asser Press 2018) 135 <https://doi.org/10.1007/978-94-6265-261-3_7>. Moreover, while the scope of data protection is limited to the processing of personal data, privacy covers broader aspects, as here mentioned. For further explanation of the scope of both rights and their somewhat blurry relationship, see Dalla Corte (2018).

[74] Espinosa Apráez and Lavrijssen (n 18).

[75] An identifiable natural person is someone "who can be identified, directly or indirectly, in particular by reference to an identifier such as a name, an identification number, location data, an online identifier or to one or more factors specific to the physical, physiological, genetic, mental, economic, cultural or social identity of that natural person" (Art. 4 (1) of the GDPR).

such as the meter identification number.[76] This number is "inextricably linked with the living individual who is responsible for the account," and thus allows him/her to be singled out from other consumers.[77] In addition, the data collected relate to the consumer's utility use profile and are used to take decisions that directly affect the consumer (e.g., billing purposes).[78]



Considering that smart meter data qualify as personal data, water utilities in the European Union will have to comply with the provisions of the GDPR. In practice, this means that water utilities (in their role of data controllers[79]) will have to take technical and organizational measures to ensure, among other things, that:

- The processing of personal data is carried out in observance of the principles of (a) lawfulness, fairness and transparency, (b) purpose limitation, (c) data minimization, (d) accuracy, (e) storage limitation, (f) integrity and confidentiality and (g) accountability (Art. 5 of the GDPR).
- The processing of personal data is based on at least one of the grounds for lawful data processing in Article 6 of the GDPR, namely: (a) consent given by the data subject, (b) necessity for the performance of a contract, (c) compliance with a legal obligation, (d) necessity for the protection of vital interests of the data subject or other natural person, (e) necessity for the performance of a task in the public interest, and (f) necessity for legitimate interests pursued by the controller or a third party.
- The processing of personal data is carried out in compliance with the rules in the GDPR by design and by default (Art. 25 of the GDPR).
- There will be a record of the data processing activities under the responsibility of the controller (Art. 30 of the GDPR).
- The level of security of the data processing activities is appropriate to the risks involved (Art. 33 of the GDPR).

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[76] Article 29 Data Protection Working Party, 'Opinion 12/2011 on Smart Metering' (2011) WP 183 8 <https://ec.europa.eu/justice/article-29/documentation/opinion-recommendation/files/2011/wp183_en.pdf> accessed 11 May 2022.

[77] Article 29 Data Protection Working Party (n 76) 8.

[78] The opinion issued by the Article 29 Data Protection Working Party was prepared having in mind energy smart meters, but the same analysis can be applied to smart water meters.

[79] A data controller is defined by Article 4 (7) of the GDPR as "the natural or legal person, public authority, agency or other body which, alone or jointly with others, determines the purposes and means of the processing of personal data; where the purposes and means of such processing are determined by Union or Member State law, the controller or the specific criteria for its nomination may be provided for by Union or Member State law."

Compliance with the GDPR is not always a very straightforward exercise if we consider, for example, that some of the principles seem to "clash" at first sight with core ideas behind big data analytics from which smart water management benefits. For instance, the principle of data minimization might be challenging to reconcile with the need to process large amounts of data to obtain better insights into consumption patterns and the functioning of infrastructures.

Beyond compliance with the GDPR, it is important to consider the limitations arising from the right to privacy, especially when smart water metering is enshrined in legislation or other forms of national regulation. Cuijpers and Koops (2013) analyzed the debates concerning privacy during the preparation of the rules that govern the rollout of smart energy meters in the Netherlands.[80] They highlight the following aspects as having a major role in the initial rejection of the smart metering bills in the Netherlands:

- The very detailed level (in terms of frequency) of the readings transmitted to the energy utilities.
- The compulsory nature of the smart metering rollout (consumers could not refuse the installation of the meter).
- Insufficient substantiation concerning the necessity of interfering with consumers' privacy and the compulsory acceptance of the meter.
- The combination of different functionalities in one meter involved new risks and made the justification of the necessity of the meters less clear.

This issues can also play a role in the case of smart meter metering in the drinking water sector and should be considered when thinking about regulating it.

To summarize, the digitalization of the drinking water sector is accompanied by the challenges of applying and complying with substantial and procedural requirements enshrined in data protection and privacy legal regimes.

### 2.5.3. Cybersecurity

The increased connectivity and reliance on ICT that come hand in hand with digitalization, create or worsen exposure to cyberattacks. While this is a concern that affects any kind of organization making use of ICT, cybersecurity becomes even more crucial when the infrastructures employed to provide essential services are involved.

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[80] Colette Cuijpers and Bert-Jaap Koops, 'Smart Metering and Privacy in Europe: Lessons from the Dutch Case' in Serge Gutwirth and others (eds), *European Data Protection: Coming of Age* (Springer Netherlands 2013) <https://doi.org/10.1007/978-94-007-5170-5_12>.

Cybersecurity can be defined as:

> *"[T]he proactive and reactive processes working toward the ideal of being free from threats to the confidentiality, integrity, or availability of the computers, networks, and information that form part of, and together constitute, cyberspace – the conceptual space that affords digitised and networked human and organisational activities".*[81]

The triad "confidentiality–integrity–availability" is at the core of cybersecurity. As explained by Rasekh et al. (2016), in (commercial) IT environments, the most prioritized aspect is "confidentiality"; but in systems such as water infrastructures, the order of the priorities changes and "availability" becomes a more crucial aspect.[82] This is because of the great negative impact that an outage of water could cause. When using ICT to monitor but also to remotely operate drinking water infrastructure, the unavailability of such systems can lead to the unavailability of the water supply, with disastrous consequences for people.

Horizontal legislation to tackle cybersecurity issues in critical sectors (including the supply of drinking water) was adopted for the first time in the European Union in 2016, with Directive EU 2016/1148 (known as the "NIS Directive"). The goal of the NIS Directive is to lay down "measures with a view to achieving a high common level of security of network and information systems within the Union so as to improve the functioning of the internal market" (Art. 1 of the NIS Directive). The NIS Directive is primarily addressed to Member States, who should adopt a national strategy on the security of network and information systems, but it is also addressed to operators of essential services (and digital service providers).

Suppliers and distributors of drinking water (both public and private) are considered operators of essential services under the NIS Directive (see Annex II, number 6 of the NIS Directive), when they: (a) provide a service "which is essential for the maintenance of critical societal and/or economic activities"; (b) "the provision of that service depends on network and information systems", and (c) "an incident would have significant disruptive effects on the provision of that service" (Art. 5 (2) of the NIS Directive).[83]

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[81] Samantha A Adams and others, 'The Governance of Cybersecurity: A Comparative Quick Scan of Approaches in Canada, Estonia, Germany, the Netherlands and the UK' (Tilburg Institute for Law, Technology and Society 2015) 26 <https://www.wodc.nl/binaries/2484-volledige-tekst_tcm28-73672.pdf>.

[82] Rasekh Amin and others, 'Smart Water Networks and Cyber Security' (2016) 142 Journal of Water Resources Planning and Management 01816004 <https://ascelibrary.org/doi/10.1061/%28ASCE%29WR.1943-5452.0000646> accessed 4 June 2020.

[83] The NIS Directive defines "incident" as "any event having an actual adverse effect on the security of network and information systems" (Art. 4 (7)).

Article 14 of the Directive introduces two main obligations for operators of essential services, namely security requirements and incident notification. Regarding security requirements, when transposing the Directive into national law, Member States must ensure that operators of essential services take "appropriate and proportionate technical and organisational measures to manage the risks posed to the security of network and information systems which they use in their operations," having in mind the state of the art (Art. 14 (1)). In addition, Member States must ensure that operators of essential services "take appropriate measures to prevent and minimise the impact of incidents affecting the security of the network and information systems used for the provision of such essential services, with a view to ensuring the continuity of those services" (Art. 14 (2)). The incident notification obligation entails that operators of essential services should notify "incidents having a significant impact on the continuity of the essential services they provide" to the competent authority or the designated computer security incident response teams (Art. 14 (3)).

Thus, digitalization of drinking water infrastructures comes hand in hand with additional exposure to cyberattacks that compromise the availability, confidentiality and integrity of the data and the infrastructures used to process data, which in turn can compromise the availability of the drinking water supply. In view of such risks, water utilities will have to put in place technical and organizational measures to prevent and effectively overcome cybersecurity incidents.

### 2.5.4. Interoperability and (Data) Standardization

Another challenge that comes with digitalization is ensuring that the different components of the smart water system are interoperable and that data from different internal and external sources can be combined and used properly. Several sources report that the level of interoperability and standardization for smart water management remains low compared to the telecommunications and electricity sector.[84] The lack of system interoperability, common data standards and data processing protocols stands in the way of achieving the potential of digitalization of drinking water utilities. Furthermore, it hinders collaboration among utilities and between utilities and other actors of the broader water sector by means of data sharing.[85]

[84] See e.g., Anzaldi Varas and ICT4Water (n 39) 34; International Telecommunication Union (n 12) 40; Lloyd Owen (n 6) 215.

[85] Lloyd Owen (n 6) 215.

## 2.6. Digitalization and the role of regulations and other public policies



The provision of drinking water is a highly regulated activity. Regulation and supervision are necessary in this sector to ensure the quality, availability and accessibility of drinking water. Quality is ensured by means of mandating the monitoring of microbiological, chemical and organoleptic parameters on a regular basis, as exemplified by the Drinking Water Directive in the European Union. Concerning availability of drinking water, Espinosa Apráez and Lavrijssen (2018) refer to an example of a regulatory instrument used to guarantee this requirement in the Netherlands.[86] Dutch drinking water companies are legally obliged to submit before the sector's supervisory authority a "delivery plan" which explains "how they will ensure the adequate and sufficient supply of drinking water and how they will address any possible disruptions," and includes the investment plans to improve infrastructures.[87] Finally, yet importantly, policymakers usually safeguard accessibility by creating universal (non-discriminatory) provision obligations and by setting or limiting the tariffs that can be charged by water utilities.

Regulations and other public policies can affect directly or indirectly, positively and negatively, the development and uptake of smart water technologies in the drinking water sector. Lloyd Owen (2018) provides examples of direct and indirect interventions or incentives that favor the digitalization of the drinking water sector:

> *Direct policy interventions include cases where governments have specified that a smart water approach should be adopted, such as smart water meters. Indirect policy incentives include tariff policies that encourage demand management along with water and wastewater quality and service delivery standards that are most effectively met through realtime monitoring and management.*[88]

A concrete and often cited example of direct policy intervention that stimulated the adoption of smart water technologies is the national smart utility metering plan in Malta, which involved the rollout of smart water (and electricity) meters to address issues of water availability and high water operating costs.[89] More recently, in the United Kingdom, as part of a strategy to tackle water shortage issues, the National Infrastructure Commission recommended that the government amend regulations and require drinking water companies "to consider systematic roll out of smart

[86] Espinosa Apráez and Lavrijssen (n 18).
[87] Espinosa Apráez and Lavrijssen (n 18) 168.
[88] Lloyd Owen (n 6) 200.
[89] OECD (n 62) 108.

meters as a first step in a concerted campaign to improve water efficiency".[90] The National Infrastructure Commission also suggested another policy intervention that can indirectly stimulate digitalization of the drinking water sector in the United Kingdom, namely, setting a target for the water industry to halve leakages by 2050. [91]

Another example of a policy intervention that can indirectly encourage further digitalization of the drinking water sector in the European Union is the review of the Drinking Water Directive. It is likely that the new Directive will introduce stricter requirements on the quality of water and on the information that should be provided to consumers,[92] which might indirectly stimulate the adoption of smart water technologies.

Conversely, digitalization in the drinking water sector might be hindered by existing regulations if they do not account for the possibilities enabled by new technologies. For example, the original provisions of the Drinking Water Directive (enacted in 1998), required that the monitoring of the quality of drinking water had to be conducted by (manually) taking samples at certain compliance points. This ruled out the possibility of using other ways of monitoring water quality, such as remote sensing techniques. The specifications of the quality monitoring programs had to be updated by Commission Directive (EU) 2015/1787 "in the light of scientific and technical progress" (Recital 2), to allow for alternative ways of monitoring, such as measurements recorded by a continuous monitoring process or inspections of records of the functionality and maintenance status of equipment.[93]

Some sources report that existing regulatory instruments in the sector might be ill equipped to enable and facilitate digitalization and innovation. For instance, a report recently published by EurEau suggests that the difficulties experienced by utilities in European Union countries in accessing and implementing innovative solutions do not lie in the lack of technological solutions, but rather on the policies that regulate "the capacity of water utilities to invest (time and money) in innovation".[94] Similarly, in their analysis of the Dutch regulatory instrument for the drinking water sector

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[90] National Infrastructure Commission, 'Preparing for a Drier Future: England's Water Infrastructure Needs' (2018) 3 <https://nic.org.uk/app/uploads/NIC-Preparing-for-a-Drier-Future-26-April-2018.pdf>.

[91] National Infrastructure Commission (n 90) 3.

[92] See European Commission, 'Drinking Water Legislation' (*Enivronment - Water - Drinking Water - Legislation*, 8 July 2019) <https://ec.europa.eu/environment/water/water-drink/legislation_en.html> accessed 4 February 2020.

[93] Annex II, Part A, par. 2 as amended by Commission Directive EU 2015/1787.

[94] EurEau, 'Innovating for a Greener Future: European Water Service Priorities' (EurEau 2020) 3 <http://www.eureau.org/resources/publications/4988-innovating-for-a-greener-future-european-water-service-priorities/file>.

known as "benchmark,"[95] de Goede et al. (2016) suggest that such an instrument might obstruct innovation. This is the case because the regulatory system and institutional interactions force drinking water companies to value financial aspects as very severe, and, in such a context, benchmarking "rewards the reproduction of the known," hampering innovation.[96]



Public policies and regulations have an important impact on digitalization in the drinking water sector. This has been confirmed by, among others, the case study report published by K-water in 2018, which surveyed ten smart water management projects in both developed and developing regions.[97] One of the main conclusions of this report is that policy support and regulations "are a major driver for [smart water management] implementation" and that successful adoption is much easier when smart water management is prioritized in the agenda of governments.[98]

## 2.7. Conclusions

This chapter has presented several aspects of digitalization in the drinking water sector, with special focus on the impact of smart water technologies on the management of infrastructures. As discussed, smart water technologies have the potential to improve the design, monitoring and maintenance of infra structures, as well as enhancing water demand management, water quality, energy efficiency and customer service.

In addition to the opportunities offered by digitalization in the drinking water sector, this chapter also discussed the challenges that come with the use of smart water technologies. The chapter explored issues related to financial aspects, cybersecurity, data protection and privacy, and interoperability, which should be considered and addressed when embracing digitalization in the drinking water sector. Finally, the chapter discussed the role of regulations and policies in stimulating or hampering digitalization in the drinking water sector. Digitalization in the supply of drinking water is still less pervasive than in other network industries. Although there is already

[95] For an explanation of this regulatory instrument used in the Netherlands, see Saskia Lavrijssen and Blanka Vitez, 'Principles of Good Supervision and the Regulation of the Dutch Drinking Water Sector': [2015] Competition and Regulation in Network Industries <https://journals.sagepub.com/doi/10.1177/178359171501600302> accessed 8 October 2020; Espinosa Apráez and Lavrijssen (n 18).

[96] Marieke de Goede and others, 'Drivers for Performance Improvement Originating from the Dutch Drinking Water Benchmark' (2016) 18 Water Policy 1247, 1259 <https://iwaponline.com/wp/article/18/5/1247/20240/Drivers-for-performance-improvement-originating> accessed 8 October 2020.

[97] K-water (n 7).

[98] K-water (n 7) 471.

a significant amount of research on the technical feasibility and opportunities of digitalization in this sector, it seems that broader adoption of smart technologies by drinking water utilities has yet to come. This is motivated by factors such as the risk averseness of water utilities, financial challenges and the vertically integrated market structure prevalent in the sector (which makes coordination between different actors less indispensable than in other sectors).

Nevertheless, it is expected that digitalization in the drinking water sector will keep growing. Smart water technologies offer more efficient ways to deal with the challenges posed by water scarcity, water pollution and aging infra structure, compared to non-digitalized approaches. In addition, it is expected that the price of smart water technologies will decrease as their development and use becomes more widespread. Finally, yet importantly, smart water management is getting higher in the agenda of national and supranational policymakers, as a key strategy to tackle the threats to sufficient and safe supply of water, contributing to the achievement of the UN's Sustainable Development Goals.

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Directive (EU) 2016/1148 of the European Parliament and of the Council of 6 July 2016 concerning measures for a high common level of security of network and information systems across the Union, OJ L 194, pp. 1–30.

Directive (EU) 2019/944 of the European Parliament and of the Council of 5 June 2019 on common rules for the internal market for electricity and amending Directive2012/27/EU, OJ L 158, pp. 125–99.

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Regulation (EU) 2016/679 of the European Parliament and of the Council of 27 April 2016 on the protection of natural persons with regard to the processing of personal data and on the free movement of such data, and repealing Directive 95/46/EC (General Data Protection Regulation), OJ L 119, pp. 1–88.

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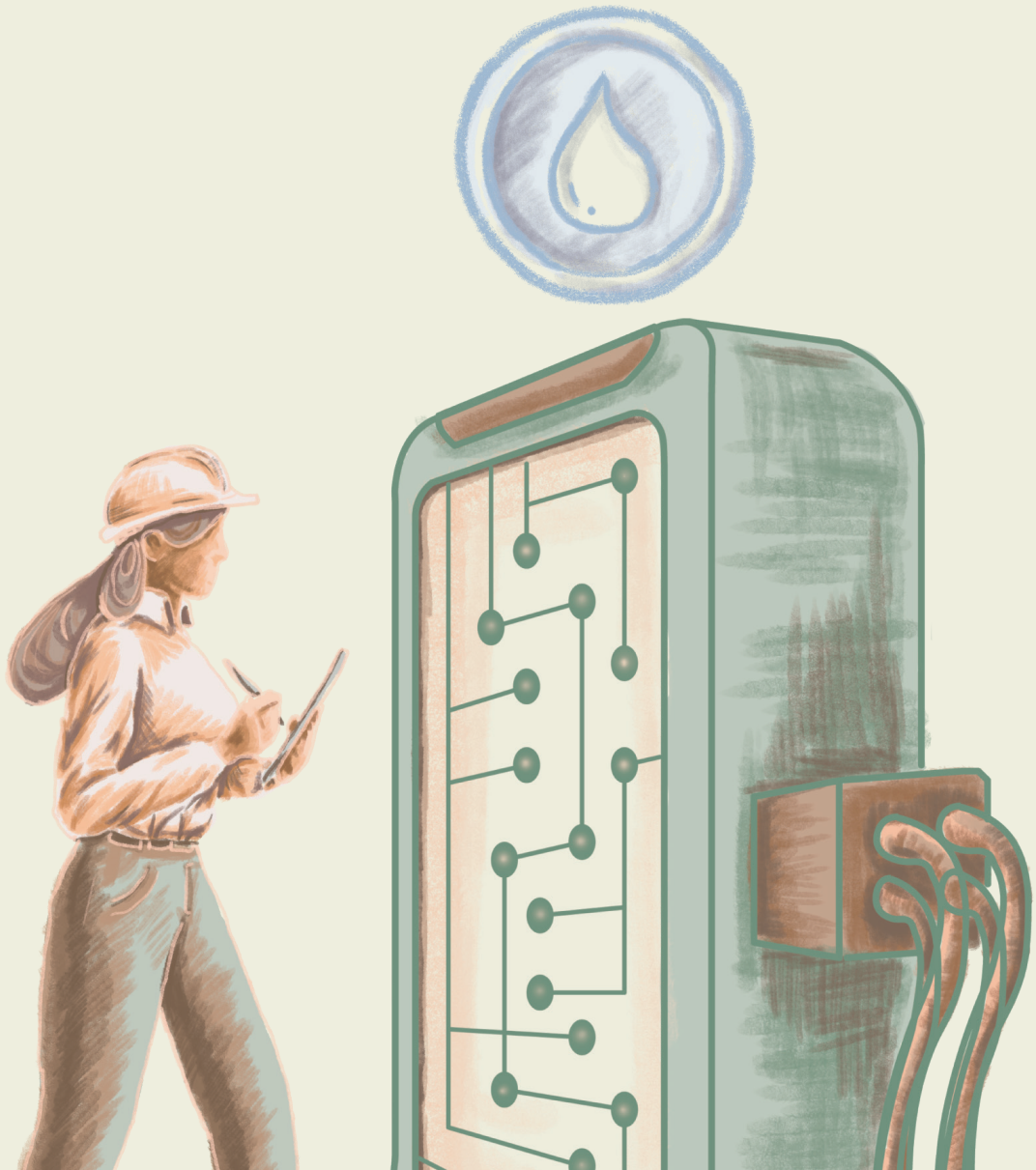

# CHAPTER 3

# Exploring the regulatory challenges of a possible rollout of smart water meters in the Netherlands

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## 3.1. Introduction

Big data have become an important driver for innovation with the potential of having a positive impact on economic and social challenges.[2] This so-called rise of big data might be explained by two principal factors: on the one hand, the increasing availability of large volumes of data at a low cost, facilitated by information and communication technologies (ICTs); and, perhaps more importantly, the increasing ability of firms and governments to analyze and extract value from the generated data.[3] Against this background, the OECD issued a report in 2015 in which the term data-driven innovation (DDI) was introduced to refer to "[t]he use of data and analytics to improve or foster new products, processes, organisational methods and markets".[4]

Infrastructure is one of the multiple sectors that may benefit from DDI. Employing DDI for the management of infrastructure "enables analysis at unprecedented depth and granularity, as well as targeted interventions in and better management of urban systems".[5] With the help of technological developments like smart metering, smart grids, sensors, and data analytics techniques, infrastructure operators can obtain improved and (near-to) real-time information about the condition and operation of the networks they manage. This "smartification" has the potential to facilitate more targeted interventions, reducing expenditures in time and costs, ensuring safer, more resilient and sustainable infrastructure, and delivering better quality service to the general public.[6]

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[2] European Commission, 'Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions "Towards a Common European Data Space"' (2018) COM(2018) 232 final <https://eur-lex.europa.eu/legal-content/en/TXT/?uri=CELEX%3A52018DC0232>; OECD, 'Data-Driven Innovation: Big Data for Growth and Well-Being' (OECD Publishing 2015) <https://doi.org/10.1787/9789264229358-en>.

[3] Kenneth Cukier and Viktor Mayer-Schoenberger, 'The Rise of Big Data: How It's Changing the Way We Think about the World' (2013) 92 Foreign Affairs 28 <https://heinonline.org/HOL/P?h=hein.journals/fora92&i=592> accessed 30 May 2022 as cited in; Jens Prüfer and Christoph Schottmüller, 'Competing with Big Data' <https://papers.ssrn.com/abstract=2918726> accessed 1 December 2018.

[4] OECD (n 2) 17.

[5] OECD (n 2) 382.

[6] Robert Ighodaro Ogie, Pascal Perez and Virginia Dignum, 'Smart Infrastructure: An Emerging Frontier for Multidisciplinary Research' (2017) 170 Proceedings of the Institution of Civil Engineers - Smart Infrastructure and Construction 8 <https://www.icevirtuallibrary.com/doi/10.1680/jsmic.16.00002> accessed 1 December 2018.

For example, smart sensors and big data infrastructure enhance the use of maintenance techniques such as data-driven condition-based maintenance or risk-based maintenance[7] and might even enable predictive maintenance.[8] The result is a more targeted and timelier ("not too early, not too late") infrastructure maintenance that can lead to an "improved availability of installations, reduction of failure costs and lower costs over the entire life cycle".[9]



As infrastructure managers increasingly rely on data to obtain better information about networks, certain changes arise in the way they perform their tasks. Firstly, implementing DDI requires that infrastructure managers have sufficient resources to collect, transmit, store, and analyze large data sets. That means that in addition to investments in traditional physical infrastructure, or "burying copper in the ground",[10] infrastructure managers must now invest in ICT and other less conventional resources, including "smart devices" and specialized expertise in ICT and data science. Secondly, to improve their processes through DDI, infrastructure managers require data from an array of different sources, which include their own systems but also government data and data generated by the consumers[11] of services provided through infrastructure (see OECD, 2015, Chapter 9). Considering that infrastructure managers usually operate in highly regulated sectors (section 3.2.3. of this chapter), it might be questioned whether the regulatory frameworks[12] that govern their tasks are still able to cope with the new possibilities of action enabled by the increasing use of DDI or whether they should be revised.

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7 Henk Akkermans and others, 'Smart Moves for Smart Maintenance: Findings from a Delphi Study on "Maintenance Innovation Priorities" for the Netherlands' (World Class Maintenance 2016) <https://www.worldclassmaintenance.com/publicaties/boeken/smart-moves-for-smart-maintenance/> accessed 1 December 2018.

8 Mainnovation and PwC, 'Predictive Maintenance 4.0: Predict the Unpredictable' (PwC 2017) <https://www.pwc.nl/en/publicaties/predictive-maintenance-40-predict-the-unpredictable.html> accessed 1 December 2018.

9 Feng Fang, Roland van de Kerkhof and L Lamper, 'De waarde van Smart Maintenance voor de Nederlandse Infrastructuur' (Wolrd Class Maintenance 2018) 9 <https://www.worldclassmaintenance.com/publicaties/boeken/de-waarde-van-smart-maintenance-voor-de-nederlandse-infrastructuur/> accessed 1 December 2018.

10 See Marga Edens, 'Public Value Tensions for Dutch DSOs in Times of Energy Transition: A Legal Approach' (2017) 18 Competition and Regulation in Network Industries 132, 134 <http://journals.sagepub.com/doi/10.1177/1783591717734807> accessed 2 May 2019.

11 The term "consumer" is used in this contribution to refer exclusively to natural persons who purchase service s such as energy and drinking water, acting outside the scope of an economic activity. See Library of the European Parliament, 'The Notion of "consumer" in EU Law' (Library of the European Parliament 2013) Library Briefing <https://www.europarl.europa.eu/RegData/bibliotheque/briefing/2013/130477/LDM_BRI(2013)130477_REV1_EN.pdf> accessed 1 December 2018.

12 The term "regulation" is employed in this chapter in a broad sense, as the diverse set of instruments by which governments set requirements on enterprises and citizens [including] laws, formal and informal orders and subordinate rules issued by all levels of government, and rules issued by nongovernmental or self-regulatory bodies to whom governments have delegated regulatory powers. (OECD, 1997, p. 6).

Smart meters are an example of technology that can facilitate the implementation of DDI in the management of utility networks. These meters not only provide more accurate information regarding the consumption of water, electricity, gas, or heating, they also generate information about the functioning of the networks. For example, smart meter data can help to pinpoint failures such as outages or leakages and can also give insights regarding the quality of the service in question.[13]

In the European Union context, a great deal of attention has been paid to the rollout of smart meters for small consumers in the energy sector (electricity and gas), but considerably less attention has been given to smart metering in the drinking water sector. While energy meters are explicitly mentioned in European Union legislation aiming to promote energy efficiency,[14] legislation applicable to drinking water[15] contains no mentions of any comparable technology. The same situation occurs at the national level in the Netherlands: While a large-scale rollout is taking place with specific regulations for energy smart meters,[16] no national rollout of smart water meters (SWM) is being carried out and no rules have yet been devised regarding the use of this technology.

Nevertheless, some Dutch drinking water companies are already conducting pilots to explore the viability of implementing SWM for household consumers. This

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[13] Elio Arniella, 'Evaluation of Smart Water Infrastructure Technologies (SWIT)' (Inter-American Development Bank 2017) <https://publications.iadb.org/publications/english/document/Evaluation-of-Smart-Water-Infrastructure-Technologies-(SWIT).pdf> accessed 5 February 2020; Guido Cervigni and Pierre Larouche, 'Regulating Smart Metering in Europe: Technological, Economic and Legal Challenges' (CERRE 2014) Report of a CERRE project <https://cerre.eu/wp-content/uploads/2020/07/140331_CERRE_SmartMetering_Final_0.pdf> accessed 11 October 2018; Yan He, Nick Jenkins and Jianzhong Wu, 'Smart Metering for Outage Management of Electric Power Distribution Networks' (2016) 103 Renewable Energy Integration with Mini/Microgrid – Proceedings of REM2016 159 <https://www.sciencedirect.com/science/article/pii/S187661021631476X>.

[14] Article 13, section 1 of the Directive 2006/32/EC of The European Parliament and of the Council of 5 April 2006 (the "Energy Efficiency Directive"), required for the first time "competitively priced individual meters that accurately reflect the final customer's actual energy consumption and that provide information on actual time of use." This Directive was later repealed by the Directive 2012/27/EU of The European Parliament and of The Council of 25 October 2012, where smart metering is mentioned in Articles 9 to 11. However, it was the Directive 2009/72/ EC of The European Parliament and of The Council of 13 July 2009 (the "Electricity Directive") which prescribed that Member States should ensure the implementation of smart meters, subject to a national positive cost-benefit analysis which had to be performed by September 3, 2012. (Annex I, section 2).

[15] In particular Council Directive 98/83/EC of 3 November 1998 on the quality of water intended for human consumption.

[16] For electricity, see the Dutch Electricity Act (*Elektriciteitswet*) of July 2, 1998, in particular, Article 16; Article 26(ac); and Article 95(la). For gas, see the Dutch Gas Act (*Gaswet*) of June 22, 2000, in particular: Article 10 (5); section 2.2a (Measuring devices and measurement data) and Article 42a. More specific provisions applicable to smart meters in both sectors are contained in the Order in Council of October 27, 2011, on remote-readable measuring devices (*Besluit op afstand uitleesbare meetinrichtingen*).

provides a good opportunity to start exploring what kinds of regulatory challenges would arise if a rollout of SWM is to be carried out in the Netherlands. To the best of our knowledge, there are no previous studies on this subject. Therefore, this chapter aims to start a discussion on the implications of increasing digitalization of infrastructures, vis-`a-vis the regulatory framework applicable to the Dutch drinking water sector.



In terms of approach, this research looks at the introduction of SWM as a technological development that brings changes to the management of drinking water networks in the Netherlands, in the sense that it enables new possibilities compared to traditional water meters. From that perspective, the research explores whether such changes may require revisiting existing regulations that are in place, both at the microlevel (specific rules applicable to the metering activity) and at the macrolevel (general rules applicable to the drinking water sector).

The method employed for this research combines a review of literature regarding smart (water) meters, DDI, law, regulation and technology, and regulation of network industries, together with an analysis of Dutch and European Union regulations, policy documents, and reports related to the drinking water sector.

The rest of this chapter is structured as follows: section 3.2. will be dedicated to a review of relevant literature; section 3.3. includes the aspects of the current Dutch regulatory framework considered in this study; the section 3.4. contains the specific analysis of the regulatory challenges of implementing smart metering for drinking water in the Netherlands. The final section (3.5.) presents the main conclusions of this research.

## 3.2. Literature review

This part will introduce the main concepts, as well as the theoretical and contextual background that are employed in this study. It will start by describing the main features of smart meters, their possible uses in the management of water infrastructure, and the current situation in the Netherlands. It will then refer to the possible need to revise regulatory frameworks as a result of technological change as explained by literature on law, regulation, and technology. Finally, it concludes with a discussion of some particular features of the network industries, like the provision of drinking water, which characterize them as highly regulated sectors.

### 3.2.1. Smart water meters

Smart meters in general can be defined as "a component of the smart grid that allows a utility to obtain meter readings on demand (daily, hourly or more frequently) without the need of manual meter readers to transmit information".[17] They are commonly used for utilities such as electricity, gas, and drinking water.

Although the specific functionalities of SWM vary according to the particular configuration of the system, they can be summarized in three main aspects. Firstly, SWM provide high resolution data that allow sampling water consumption on sub-daily basis.[18] Secondly, SWM are connected to a communication system that allows meter data to be remotely accessible. Thirdly, SWM can provide information about the functioning of the system and eventually the quality of the water itself. These features enable a number of possibilities, such as[19]

- precise consumption measurement, reducing billing errors and disputes with consumers;
- monitoring the water system in a timely manner;
- easing and lowering the cost of meter reading (avoiding manual reading);
- providing precise data to balance water demand;
- facilitating prompt leak detection in consumer premises or other parts of the network (e.g. analyzing information generated from a building or a block);
- prompt detection of theft or other causes of water loss;
- creating awareness about water conservation and facilitating enforcement of local water restrictions;
- applying dynamic prices; and
- additional features may also enable to measure water quality parameters, such as temperature or pressure.

In addition to the opportunities that SWM enable, it is also relevant to mention the main concerns related to this technology. From a legal perspective, the most recurrent concerns related to smart meters are the challenges that they may create

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[17] Arniella (n 13) 15.

[18] A Cominola and others, 'Benefits and Challenges of Using Smart Meters for Advancing Residential Water Demand Modeling and Management: A Review' (2015) 72 Environmental Modelling & Software 198 <http://www.sciencedirect.com/science/article/pii/S1364815215300177> accessed 21 January 2020.

[19] Summarized from Arniella (n 13); Energistyrelsen, 'Dansk afklaring om fjernaflæsning i forhold til databeskyttelsesforordningen' (Energistyrelsen 2018) <https://ens.dk/sites/ens.dk/files/Forsyning/fjernaflaesning.pdf> accessed 11 October 2018; Oracle, 'Smart Metering for Water Utilities' (Oracle 2009) <http://www.oracle.com/us/industries/utilities/046596.pdf> accessed 11 October 2018; Joost van Summeren and others, 'Analyse van slimme meter-data voor het in kaart brengen van hotspots in het distributienet' (KWR 2017) KWR 2017.059 <https://library.kwrwater.nl/publication/55511533/> accessed 11 October 2018.

for the protection of privacy and personal data.[20] This can be the case because smart meters are installed at the homes of consumers and generate information which can give insights about their private and family life, including behavior, habits, or preferences, which in turn might result in unintended consequences such as profiling or tracking.



### Current status in the Netherlands

Unlike network operators in the Dutch energy sector (gas and electricity), Dutch drinking water companies are not obliged to carry out a national rollout of smart meters, and at the moment there are no government-lead initiatives, policies, or studies conducive to a nation-wide implementation of SWM in the Netherlands. Therefore, there is no particular framework that provides guidance to the drinking water companies regarding the implementation of this technology.

Regarding the reasons why there is no large rollout of SWM in the Netherlands yet, it seems that the cost–benefit analysis is not positive at the moment. Firstly, it appears that the cost of implementing this technology national-wide is too high for the time being.[21] Secondly, as previously mentioned, there is no national or European Union policy mandating or at least facilitating the implementation of SWM, in contrast with the situation of the same technology in the energy sector. In addition, the price of water in the Netherlands is rather cheap compared, for instance, to electricity, and this may also decrease the interest of consumers in obtaining better insights of their water consumption.[22] Finally, the country is not facing serious threats of water scarcity at the moment.[23]

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[20] See regarding smart energy meters Max Baumgart and Rafael Leal-Arcas, 'A (Legal) Challenge to Privacy: On the Implementation of Smart Meters in the EU and the US' in Jan Wouter (ed), *Research Handbook on EU Energy Law and Policy* (Edward Elgar Publishing 2017) <https://doi.org/10.4337/9781786431059>; Colette Cuijpers and Bert-Jaap Koops, 'Smart Metering and Privacy in Europe: Lessons from the Dutch Case' in Serge Gutwirth and others (eds), *European Data Protection: Coming of Age* (Springer Netherlands 2013) <https://doi.org/10.1007/978-94-007-5170-5_12>; Vagelis Papakonstantinou and Dariusz Kloza, 'Legal Protection of Personal Data in Smart Grid and Smart Metering Systems from the European Perspective' in Sanjay Goel and others (eds), *Smart Grid Security* (Springer 2015) <https://doi.org/10.1007/978-1-4471-6663-4_2> accessed 31 May 2021.

[21] Jean Quist, 'Waterbedrijven krijgen meer interesse voor slimme meter' (*Cobouw*, 6 March 2013) <https://www.cobouw.nl/175019/waterbedrijven-krijgen-meer-interesse-voor-slimme-meter> accessed 11 October 2018.

[22] Quist (n 21).

[23] P Geudens and J van Grootveld, 'Dutch Drinking Water Statistics 2017' (Vewin 2017) <https://www.vewin.nl/SiteCollectionDocuments/Publicaties/Cijfers/Drinkwaterstatistieken-2017-EN.pdf> accessed 10 November 2018; OECD, *Enhancing Water Use Efficiency in Korea* (IWA Publishing 2017) <http://ebookcentral.proquest.com/lib/uvtilburg-ebooks/detail.action?docID=5188255> accessed 17 July 2019; 'Waterbeschikbaarheid En de Waterketen' (*De staat van ons water*, 2018) <http://www.destaatvanonswater.nl/waterbeschikbaarheid-en-de-waterketen> accessed 11 October 2018.

However, the availability of fresh water sources may be endangered by extreme climate, like the climate experienced during the spring and summer of 2018, which were registered as the driest ever, breaking a record from 1976.[24] This could be a game changer which, together with the additional opportunities that SWM brings for a smarter management of the drinking water network, may eventually lead to a systematic rollout, especially if the technology becomes more affordable overtime. According to publicly available information, at least 3 of the 10 Dutch drinking water companies, namely Vitens,[25] Oasen,[26] and Brabant Water,[27] have each started pilots to explore the viability of such technology, mainly for the following purposes: to improve the monitoring of the network, especially leak detection;[28] to increase consumption awareness and stimulate rational use; and to measure factors affecting the quality of the water, such as temperature or pressure.

### 3.2.2. Technological change and regulation

The introduction of new possibilities of action as a result of technological change[29] can reveal the need to revisit regulations in place and eventually adjust them to deal with new practices and their positive and negative consequences. As explained by Bennett Moses (2013), regulations are designed to operate in an assumed (explicit or

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[24] 'Voorjaar en zomer van 2018 tot nu toe de droogste ooit gemeten' (*RTL Nieuws*, 24 July 2018) <https://www.rtlnieuws.nl/nieuws/nederland/artikel/4303756/voorjaar-en-zomer-van-2018-tot-nu-toe-de-droogste-ooit-gemeten> accessed 11 October 2018; 'Waterbeschikbaarheid En de Waterketen' (n 23).

[25] See Tim Koorn, 'Vitens Zet Gaming in Om Waterbewustzijn Te Vergroten' (*H2O/Waternetwerk*) <https://www.h2owaternetwerk.nl/h2o-actueel/vitens-zet-gaming-in-om-waterbewustzijn-te-vergroten> accessed 11 October 2018; Sensus, 'Sensus FlexNet Communication Network to Remotely Read Hard-to-Reach Water Meters Successfully Tested by Vitens' (*Sensus*) <https://sensus.com/news-events/news-releases/sensus-flexnet-communication-network-remotely-read-hard-reach-water-meters-successfully-tested-vitens/> accessed 11 October 2018..

[26] See Janneke Moors, Jurjen den Besten and Peter Mense, 'Eerste Resultaat Met DMA Behaald: Verborgen Lekkage Efficiënt Opgespoord' (H2O Online 2016) <https://www.h2owaternetwerk.nl/images/H2O-Online_1602-06_Lekzoeken_DMA-Moors_et_al.pdf> accessed 11 October 2018; Zewei Chen, 'The Smart Water Meter: A New Method to Monitor Fouling Issue' (Delft University of Technology 2016) <https://repository.tudelft.nl/islandora/object/uuid%3A2c9e9905-c35a-4749-9b9f-c92362384979> accessed 11 October 2018.

[27] See van Summeren and others (n 19).

[28] In combination with district metered areas, which entail dividing the water system into several sub-metered areas, in a way that the water supply and consumption can be measured individually from the rest of the system. See Arniella (n 13).

[29] It is important to note that the emphasis is not in technology in itself, but in the new dynamics that technology creates. In this sense, as explained by Bennett Moses, technology in itself does not amount as a rationale for regulation or as a regulatory target, but the "sociotechnical change" resulting from the introduction of new technologies or new uses of existing technologies might very well call for a regulatory response. Lyria Bennett Moses, 'Regulating in the Face of Sociotechnical Change' in Roger Brownsword, Eloise Scotford and Karen Yeung (eds), *The Oxford Handbook of Law, Regulation and Technology* (Oxford University Press 2017) <https://www.oxfordhandbooks.com/view/10.1093/oxfordhb/9780199680832.001.0001/oxfordhb-9780199680832-e-49>.

implicit) socio-technical landscape. [30] In that sense, to the extent that technological change may enable practices that were previously unknown or irrelevant, such change is at least potentially problematic vis-`a-vis the regulations in place.[31]

The same author introduced a classification of the main legal issues that may follow technological change, namely:

> *(1) the potential need for laws to ban, restrict, or, alternatively, encourage a new technology; (2) uncertainty in the application of existing legal rules to new practices; (3) the possible overinclusiveness or under-inclusiveness of existing legal rules as applied to new practices; and (4) alleged obsolescence of existing legal rules.32*

The same or similar "typologies" are followed in subsequent literature, such as Marchant[33] and Butenko and Larouche.[34] The first issue refers to the fact that new practices may enable new social dynamics with associated benefits and risks that are not adequately addressed in already existing regulations, revealing a regulatory gap. In this case, the creation of new rules is deemed necessary to limit possible harms and/or to take advantage of technologies that are perceived as beneficial for society.[35]

In the second scenario, there is no immediate need for new rules, to the extent that there are certain rules that should be in principle applicable, but the new context gives rise to uncertainty regarding the application of such rules. The core of the problem lies in the fact that the permissibility of the newly enabled conducts is generally determined by legal categories and concepts which determine what kinds of actions fall within the scope of a certain rule.[36] Thus, the emergence of new possibilities of

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[30] Lyria Bennett Moses, 'How to Think about Law, Regulation and Technology: Problems with "Technology" as a Regulatory Target' (2013) 5 Law, Innovation and Technology 1, 18 <https://doi.org/10.5235/17579961.5.1.1> accessed 11 October 2018.

[31] Bennett Moses, 'How to Think about Law, Regulation and Technology' (n 30) 18.

[32] Lyria Bennett Moses, 'Recurring Dilemmas: The Law's Race to Keep up with Technological Change' (2007) 2007 University of Illinois Journal of Law, Technology & Policy 239, 243 <http://illinoisjltp.com/journal/wp-content/uploads/2013/10/05-05-08_Moses_AHW_Formatted_FINAL.pdf> accessed 11 October 2018.

[33] Gary E Marchant, 'The Growing Gap Between Emerging Technologies and the Law' in Gary E Marchant, Braden R Allenby and Joseph R Herkert (eds), *The Growing Gap Between Emerging Technologies and Legal-Ethical Oversight: The Pacing Problem* (Springer Netherlands 2011) <https://doi.org/10.1007/978-94-007-1356-7_2>.

[34] Anna Butenko and Pierre Larouche, 'Regulation for Innovativeness or Regulation of Innovation?' (2015) 7 Law, Innovation and Technology 52 <https://doi.org/10.1080/17579961.2015.1052643> accessed 11 October 2018.

[35] Bennett Moses, 'Recurring Dilemmas' (n 32); Butenko and Larouche (n 34); Gary E Marchant, 'Addressing the Pacing Problem' in Gary E Marchant, Braden R Allenby and Joseph R Herkert (eds), *The Growing Gap Between Emerging Technologies and Legal-Ethical Oversight: The Pacing Problem* (Springer Netherlands 2011) <https://doi.org/10.1007/978-94-007-1356-7_13>.

[36] Bennett Moses, 'Recurring Dilemmas' (n 32); Gregory N Mandel, 'Legal Evolution in Response to Technological Change' in Roger Brownsword, Eloise Scotford and Karen Yeung (eds), *The Oxford Handbook of Law, Regulation and Technology* (Oxford University Press 2017) <https://www.oxfordhandbooks.com/

action enabled by technology may create challenges regarding preexisting categories, in some cases because new practices may not fit neatly in already existing "legal boxes,"[37] and in some other cases because the category in itself becomes contestable.[38]

A third issue that might become evident as the result of technological change is a mismatch between the content and scope of a rule and the goal that such rule intended to achieve.[39] The mismatch will result in over-inclusiveness when a certain rule regulates behavior that should not be subject to control or will result in under-inclusiveness when a conduct or situation that should be controlled escapes constraint.[40]

Finally, technological change may render existing rules obsolete in different ways: Technological change may reduce or eliminate the importance of the regulated conduct; the reasons to regulate a certain conduct may disappear as a result of technological change; and technological change may reduce the cost-effectiveness of a certain rule and therefore its enforcement turns prohibitively expensive.[41]

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view/10.1093/oxfordhb/9780199680832.001.0001/oxfordhb-9780199680832-e-45>.

37 Robert Baldwin, Martin Cave and Martin Lodge, *Understanding Regulation: Theory, Strategy, and Practice* (Oxford University Press, Incorporated 2012) <http://ebookcentral.proquest.com/lib/uvtilburg-ebooks/detail.action?docID=829488> accessed 6 July 2022.Consider for example the case of Uber and particularly the ruling of the Court of Justice of the European Union in 2017 (Asociación Profesional Elite Taxi v Uber Systems Spain SL, C-434/15). In the context of a reference from a preliminary ruling requested by a Spanish judge, the Court had to decide whether Uber (a platform that connects nonprofessional drivers with people who need to commute) ought to be classified as a transport service, information society service, or a combination of both. The main implication of the decision was that, if the platform falls within the category of transport services, then Uber Systems Spain was obliged to comply with the Spanish regulations for such services, including the obligation of obtaining prior administrative authorization to operate. In the end, the Court ruled that Uber "must be regarded as being inherently linked to a transport service and, accordingly, must be classified as 'a service in the field of transport'" within the meaning of European Union law (Asociación Profesional Elite Taxi v Uber Systems Spain SL, 2017).

38 Consider the example brought by Bennett Moses: while some decades ago, the scope of the concept of "mother" was undisputable, as a result of in vitro fertilization and surrogacy it is in principle not obvious anymore who should be considered "mother" for legal purposes.Bennett Moses, 'Recurring Dilemmas' (n 32) 257.

39 Bennett Moses, 'Recurring Dilemmas' (n 32).

40 One example of poor targeting as the result of technological change may be found in the occupancy tax or hotel tax as a result of the apparition of Airbnb (see e.g., Daniel Guttentag, 'Airbnb: Disruptive Innovation and the Rise of an Informal Tourism Accommodation Sector' (2015) 18 Current Issues in Tourism 1192 <https://doi.org/10.1080/13683500.2013.827159> accessed 11 October 2018.). These taxes are usually related to tourism uses and are directed to guests making use of accommodation facilities, namely hotels. Although not being a hotel, Airbnb hosts provide the same kind of service to travelers (accommodation). This resulted, at least at the beginning, in Airbnb users escaping the tax, and Airbnb obtaining an economic advantage over the traditional industry (Guttentag, 2013, p. 1201). Therefore, the introduction of this online platform affected the targeting of existing regulations, rendering them underinclusive.

41 Bennett Moses, 'Recurring Dilemmas' (n 32) 265–269.

The four regulatory issues just described illustrate that technological change can reveal the need to revisit the regulations in place, either because there are no rules to deal with the new possibilities of action (with their associated benefits and concerns) or because the existent rules do not operate as effectively as in the past given the new reality. The importance of addressing such challenges and trying to keep a good connection between practice and the relevant regulatory frameworks relates to the roles of regulation in respect of innovation, which can be summarized in maximizing its benefits (ensuring that there is an adequate regulatory environment for innovation to flourish and steering it in the "right" direction) while reducing possible or actual negative consequences (by prohibiting undesirable innovations or stablishing limitations to the use of innovation).[42]



### 3.2.3. Managing infrastructures in the context of heavily regulated sectors

Water, energy, transport, or telecommunications are considered network sectors characterized by the use of infrastructure such as wires, cables, pipes, roads or railways, or junctions through which such services are offered.[43] According to Bauer (as cited in Knops (2008)[44]), some of the most salient features of network industries are high capital intensity and high investment requirements; the vital importance of the services provided by the network industries for individuals and businesses; their strategic value in terms of economic growth and national security; and the indispensability and non-substitutability of the services provided by network industries.

The key value of network industries for society explains why they were initially directly controlled by the state.[45] However, early experiences in the 1980s in the United States and the United Kingdom led many to embrace the idea that dismantling the state monopoly in the provision of network-based services and opening such services to the market would increase efficiency, which in turn gave rise to processes of

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[42] Bennett Moses, 'Recurring Dilemmas' (n 32); Roger Brownsword and Han Somsen, 'Law, Innovation and Technology: Before We Fast Forward—A Forum for Debate' (2009) 1 Law, Innovation and Technology 1 <https://doi.org/10.1080/17579961.2009.11428364> accessed 10 November 2018; Butenko and Larouche (n 34).

[43] Adrie Dumaij, Alex van Heezik and Flóra Felsö, *Regulation and Performance in Dutch Network Sectors: An Empirical Analysis of Relationships between Regulation and Productivity Development from 1985 to 2012* (TU Delft, IPSE Studies 2014) 15 <https://www.researchgate.net/publication/261211790_Regulation_and_performance_in_Dutch_network_sectors_An_empirical_analysis_of_relationships_between_regulation_and_productivity_development_from_1985_to_2012> accessed 11 October 2018.

[44] Hamilcar Pieter Anton Knops, *A Functional Legal Design for Reliable Electricity Supply: How Technology Affects Law* (Intersentia 2008) 2.

[45] Hans De Bruijn and Willemijn Dicke, 'Strategies for Safeguarding Public Values in Liberalized Utility Sectors' (2006) 84 Public Administration 717, 718 <https://onlinelibrary.wiley.com/doi/abs/10.1111/j.1467-9299.2006.00609.x> accessed 24 June 2019; Baldwin, Cave and Lodge (n 37) 443; Dumaij, van Heezik and Felsö (n 43) 15.

liberalization and privatization.[46] The loss of direct control by the state suggested, in principle, that there would be more freedom in the market and less subjection to regulations. However, as explained by Vogel, the introduction of more competition is not necessarily accompanied by deregulation, indeed on the contrary, in many cases, the result has been "freer markets and more rules".[47]

Adding to this, while certain parts of the value chain of network industries might be open to competition (e.g., supplying the end customer in the energy sector), the management of distribution networks is usually carried out by natural monopolies[48] because it would be extremely costly if every new market entrant would have to stablish an entire network from scratch.[49]

To control possible monopolistic behavior (e.g., limiting output or quality and setting profit maximizing prices) and/or to simulate actual competition at the network management level, different sector specific regulatory instruments, such as economic regulation (e.g., rate of return, price-cap or yardstick regulation) or rules of third-party access, are used.[50] In addition, sector-specific regulations require that infrastructure managers ensure that public values such as universal access, safety, reliability, affordability, and sustainability can be achieved.[51]

In addition, a complex network of public authorities, including, among others, legislators, ministries, regulatory agencies, regional, and local authorities, is in charge of the creation and enforcement of rules governing the management of infrastructure.[52] In some cases, such a network can be expanded in scope as a result

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[46] Mark de Bruijne, 'Networked Reliability. Institutional Fragmentation and the Reliability of Service Provision in Critical Infrastructures' (PhD Dissertation, Delft University of Technology 2006) 42 <http://rgdoi.net/10.13140/RG.2.1.2970.9046> accessed 10 November 2018; Dumaij, van Heezik and Felsö (n 43) 15.

[47] Steven K Vogel, *Freer Markets, More Rules: Regulatory Reform in Advanced Industrial Countries* (Peter J Katzenstein ed, Cornell University Press 1996) 3 <https://www.jstor.org/stable/10.7591/j.ctv1nhm3h> accessed 11 October 2018.

[48] A natural monopoly entails that "the market is served most cheaply by a single firm, rather than by a multiplicity of competing firms", Baldwin, Cave and Lodge (n 37) 444.

[49] Baldwin, Cave and Lodge (n 37) 443–444; Dumaij, van Heezik and Felsö (n 43) 15.

[50] Dumaij, van Heezik and Felsö (n 43) 20–22.

[51] In this regard, seeBruijn and Dicke (n 45); de Bruijne (n 46); Dumaij, van Heezik and Felsö (n 43); Marga Edens and Saskia Lavrijssen, 'Balancing Public Values During the Energy Transition - How Can German and Dutch DSOs Safeguard Sustainability?' (Tilburg University 2018) TILEC Discussion Paper No. 2018-015 <https://papers.ssrn.com/abstract=3179372> accessed 1 December 2018; Bauke Steenhuisen, 'Competing Public Values: Coping Strategies in Heavily Regulated Utility Industries' (PhD Dissertation, Delft University of Technology 2009) <https://repository.tudelft.nl/islandora/object/uuid%3A3257cd11-13ad-4636-8074-32b2dd5276e2> accessed 11 October 2018; Wijnand Veeneman, Willemijn Dicke and Mark Bruijne, 'From Clouds to Hailstorms: A Policy and Administrative Science Perspective on Safeguarding Public Values in Networked Infrastructures' (2009) 4 International Journal of Public Policy 414.

[52] Steenhuisen (n 51) 2–3.

of the internationalization of its governance, as it is the case within the European Union.[53] Furthermore, other stakeholders can play a role in terms of oversight of infrastructure sectors, such as the public or private shareholders of infrastructure managers (when the latter are organized as companies) and private actors like consumer organizations. The result of this complex system is "an increasingly packed oversight environment surrounding the network-based utility industries".[54]



In sum, infrastructure managers operate in highly regulated sectors. This suggests that infrastructure managers may face more constraints than other actors in less regulated markets. For example, while less regulated organizations may freely decide whether and how to invest in innovative solutions, network operators are compelled to follow the priorities and policy goals established by national (and supranational) rule-makers. While less regulated market actors may diversify their businesses and even try to tap new markets,[55] network operators are limited to performing the activities assigned to them by the regulations that govern their sector. While less regulated organizations have more freedom to stablish the prices they charge for their products and services to maximize their profits, network managers are usually subject to different types of economic regulation and/or regulated network tariffs, as set by independent authorities intending to ensure that the public values related to the service in question will not be sacrificed to profitability.[56] This is usually accompanied by regulatory requirements to apply tariffs that are cost-oriented, reasonable, transparent, and nondiscriminatory.[57]

The previous examples illustrate that, given the highly regulated context in which infrastructure managers operate, they are likely to face more legal constraints in their possibilities of using innovative solutions than less regulated organizations. In this sense, the need to maintain a good connection between what is possible in practice and the existing regulatory frameworks (section 3.2.2.) becomes even more relevant.

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[53] Martijn LP Groenleer, 'Redundancy in Multilevel Energy Governance: Why (and When) Regulatory Overlap Can Be Valuable' <https://papers.ssrn.com/abstract=2865683> accessed 10 November 2018; Saskia Lavrijssen and Thomas Kohlbacher, 'EU Electricity Network Codes: Good Governance in a Network of Networks' <https://papers.ssrn.com/abstract=3098081> accessed 6 July 2022.

[54] Steenhuisen (n 51) 3.

[55] See regarding digital platforms, Prüfer and Schottmüller (n 3).

[56] Annetje Ottow and Saskia Lavrijssen, 'Independent Supervisory Authorities: A Fragile Concept' (2012) 39 Legal Issues of European integration 419 <http://dspace.library.uu.nl/handle/1874/275264> accessed 11 October 2018.

[57] Saskia Lavrijssen and Blanka Vitez, 'The Principles of Good Regulation in the Water Sector' <https://papers.ssrn.com/abstract=2552036> accessed 11 October 2018; Edens and Lavrijssen (n 51) 9.

## 3.3. The relevant regulatory framework for drinking water in the Netherlands

This section will outline the aspects of the Dutch regulatory framework for drinking water that are relevant for the analysis in section 3.4.1. It will start with a reference to the main legislative and regulatory provisions of the sector and will continue with the current regulations applicable specifically to the metering.

### 3.3.1. General regulatory framework

The general regulatory framework for the drinking water sector[58] in the Netherlands is mainly provided by the Drinking Water Act (*Drinkwaterwet* in Dutch) of July 18, 2009; the Drinking Water Regulation (*Drinkwaterregeling*) of June 14, 2011; and the Drinking Water Decree (*Drinkwaterbesluit*) of May 23, 2011. Of relevance is also the Policy Note (*Beleidsnota* in Dutch), a document adopted at least every 6 years by the Minister of Infrastructure and Water Management, which contains the guidelines and principles of the drinking water supply policy that the Dutch government will follow.[59] The most recent Policy Note was issued in 2014. As it will be shown in this section, the Dutch drinking water sector is subject to tight regulations.

According to this framework, 10 drinking water companies (*drinkwaterbedrijven*)[60] are in charge of producing, distributing, and supplying drinking water in the Netherlands. As part of their legal obligations, these companies are tasked with establishing and maintaining the infrastructure necessary for the production and distribution of drinking water.[61] As such, these companies are the network operators in this sector. They are incorporated as public limited companies with municipalities and provinces as their shareholders, with the exception of one organization, which has the legal form of a foundation. Only public entities or companies controlled by legal entities subject to public law can be the shareholders of drinking water companies.[62]

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[58] Drinking water is defined in Article 1(1) of the Dutch Drinking Water Act as the "water intended or intended to be used for drinking, cooking or preparing food or for other household purposes, with the exception of domestic hot water, which is made available to consumers or other customers by means of pipes." (free translation).

[59] Article 6, Drinking Water Act.

[60] The 10 drinking water companies currently operating in the Netherlands are Brabant Water, Dunea, Evides, Waterbedrijf Groningen, Oasen, PWN Waterleidingbedrijf Noord-Holland, Vitens, Stichting Waternet Amsterdam, Waterleidingmaatschappij Drenthe and Waterleiding Maatschappij Limburg (Drinking Water Regulation, Appendix 1, belonging to Article 4).

[61] Article 7, Drinking Water Act.

[62] Articles 1 and 15, Drinking Water Act.

These drinking water companies operate as monopolies within the distribution areas assigned to each of them by the Ministry of Infrastructure and Water Management.[63] As a consequence, consumers cannot freely choose or change their water supplier, and they are "tied" to the drinking water company that operates in their area of residence. As such, drinking water consumers are captive consumers.[64]



The oversight of the drinking water sector in the Netherlands is mainly the responsibility of the Inspectorate of Human Environment and Transport (*Inspectie Leefomgeving en Transport*—ILT), an authority belonging to the Ministry of Infrastructure and Water Management,[65] which also takes part in the oversight of the sector.

In addition, the Authority for Consumers and Markets (ACM) fulfils an advisory role, mainly assisting the ILT in its tariff monitoring task,[66] as well as the Ministry in determining the weighted average cost of capital (WACC) that the drinking water companies must observe,[67] as it will be discussed below.

There are three major regulatory instruments in place in the Dutch drinking water sector.[68] The first one is the performance comparison (*prestatievergelijking*), also known as "benchmark".[69] This benchmark is performed triennially by the ILT and compares the 10 drinking water companies on 5 main points: the quality of supplied water, the environmental aspects of the drinking water supply, customer service, cost efficiency, and research and development.[70] Within 6 months of the delivery of the ILT report, the drinking water companies must inform the Ministry in writing how they will improve their performance, information which will be also shared with both Houses of the States General.[71]

The second regulatory instrument entails financial oversight coupled with tariff monitoring. In the Netherlands, the costs involved in the supply of drinking water are exclusively covered by the tariff charged by the drinking water companies.[72]

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[63] Drinking Water Regulation, Appendix 1, belonging to Article 4.

[64] Lavrijssen and Vitez (n 57) 12–13.

[65] Article 48, Drinking Water Act.

[66] Article 8a, paragraph 2 of the Drinking Water Decree.

[67] Article 8a, paragraph 1(b) of the Drinking Water Decree.

[68] Andersson Elffers Felix, 'Eindrapport Evaluatie Doelmatigheid Drinkwaterwet' (Andersson Elffers Felix 2017) <https://zoek.officielebekendmakingen.nl/blg-824138.pdf> accessed 11 October 2018.

[69] Lavrijssen and Vitez (n 57).

[70] Article 39, Dutch Drinking Water Act

[71] Article 44, Drinking Water Act.

[72] Jos Blank and Alex van Heezik, *Productiviteit van overheidsbeleid; Deel IV, De Nederlandse netwerksectoren 1980-2015* (IPSE Studies 2017) 42 <https://repository.tudelft.nl/islandora/object/uuid%3Acc1802a9-c38e-4529-

However, the drinking water companies are not entirely free to decide what tariffs they will apply. Any costs of capital that they want to pass on to the tariff are limited by the WACC that is predetermined by the Ministry of Infrastructure and Water Management with the advice of ACM.[73] If the profit earned by the drinking water companies exceeds the WACC, they must compensate this excess in the tariff for the following calendar year.[74] In addition, the ILT (advised by ACM) monitors compliance with the requirements laid down in Article 11(1) of the Drinking Water Act, according to which the tariffs must be cost-effective, transparent, and nondiscriminatory.

The third way of exercising control over drinking water companies relates to their task of investing in infrastructure improvements. As part of their legal obligations, drinking water companies must submit to the ILT a "delivery plan" stating how they will ensure the adequate and sufficient supply of drinking water and how they will address any possible disruptions.[75] The delivery plan must consider the Policy Note prepared by the Ministry of Infrastructure and Water Management.[76] Furthermore, the plan must contain multiyear investment plans to improve the drinking water infrastructure, which in turn require the approval of the licensing department of the ILT, thereby allowing authorities to monitor the planned investments of the drinking water companies.[77] In addition, these infrastructure improvement investments are also used as an indicator assessed by the ILT when conducting the abovementioned benchmark.[78]

### 3.3.2. Specific regulations for metering

In addition to the general regulatory framework, it is relevant to explain how metering is currently regulated in the Dutch drinking water sector.[79] The first observation is that this activity is not explicitly mentioned in any of the legal or regulatory texts above mentioned. In fact, in the Netherlands, the metering is governed by the general conditions of drinking water supply published and applied by the drinking water companies, which form part of their contracts with consumers. In theory, each of the companies may draft its own general conditions, but in practice they replicate the conditions included in a model prepared by Vewin (the Dutch association of water companies), in consultation with the Dutch Consumers

b03f-b1f602fbc0bd> accessed 11 October 2018.

[73] Article 10, Drinking Water Act; Article 6, Drinking Water Regulation.

[74] Article 12(3) Drinking Water Act; Lavrijssen and Vitez (n 57).

[75] Article 37, Drinking Water Act.

[76] Article 37, paragraph 2 of the Drinking Water Act.

[77] Andersson Elffers Felix (n 68).

[78] Andersson Elffers Felix (n 68).

[79] It is worth noting that this study does not focus on the regulation of technical aspects but on the rules that assign responsibilities and rights regarding the installation and operation of water meters.

Association (*Consumentenbond*), a practice established since 1979. For this reason, the latest model published by Vewin in 2012 (hereinafter "the Vewin model")[80] will be used in this contribution as the specific regulatory framework for the metering activity.

The measuring device (water meter) is defined in the Vewin model as the equipment used by the drinking water company to determine the quantity of the drinking water supplied, which generates the data deemed necessary for invoicing and monitoring consumption.[81] The specific provisions related to metering are mainly found in Articles 10 to 13 of the Vewin model. The relevant aspects of these provisions are:

- The drinking water company decides how the consumption is measured. It is the choice of the company whether to employ a measuring device (water meter) or not. When this is the case, the readings of the water meter are (as a general rule) binding for the company and the consumer.
- The use of the water meter is only oriented to determine the consumption of drinking water.
- The measuring device is installed and maintained by or on behalf of the company and at its own expense, unless the device gets lost or damaged by the consumer.
- At least once a year the consumer must record the position of the measuring device and inform it to the drinking water company in the way and term specified by the latter. However, the companies have the right to take the readings themselves.
- If the consumer does not inform the meter readings to the drinking water company, the company may make an estimation of the water consumed for billing purposes.
- The consumer must ensure that the measuring device is always accessible and can be properly read. In addition, the consumer must protect the device against damage, breaking of the seal, and must prevent frost damage.

## 3.4. Analysis

This section brings together the aspects discussed in sections 3.2. and 3.3. to explore what kinds of regulatory challenges may become evident if SWM is to be introduced in the Netherlands. The analysis is divided in two parts: The first part refers to the specific rules concerning the metering activity (microlevel). The second part refers to possible implications of SWM in the context of the general regulatory framework (macrolevel).

[80] Vewin, 'Model Algemene Voorwaarden Drinkwater 2012' (Vewin 2012) <https://www.vewin.nl/SiteCollectionDocuments/Publicaties/Overige%20Vewin%20publicaties/Model_algemene_voorwaarden_Vewin_2012.pdf> accessed 11 October 2018.

[81] Article 1, Vewin model.

### 3.4.1. Microlevel

At the microlevel, the specific rules applicable to the metering in the Dutch drinking water sector will clearly require adaptations or additions to deal with both the opportunities and concerns of SWM. Under the current framework (see section 3.3.2.), the only use of water meters is to determine the consumption of water, mainly for billing purposes. The additional possibilities enabled by SWM which can improve the managing of the drinking water network (section 3.2.1.) are not yet accounted for in the current rules applicable to the use of meter devices.

The adaptations will entail among others: introducing a new definition of the measuring device that includes the additional purposes for which SWM can be used; adjusting the frequency of the meter readings to attain the proposed goals; and eliminating the consumer obligation of manually sending the readings to the drinking water company.

In addition, since the current rules were drafted for traditional meters, they do not contemplate possible concerns regarding privacy that SWM may introduce as a result of more frequent measurements of water consumption (section 3.2.1.).

The privacy concerns related to smart meters caused great debate in the Netherlands when the legislation to support the rollout of electricity smart meters was being drafted.[82] The initial proposal presented by the Dutch government to the Parliament in 2008 included, among others, that the installation of the meter was mandatory (refusal by the consumer constituted an economic offence) and that the meter readings would be sent to the Distribution System Operator every 15 minutes.[83] This proposal was rejected by the Parliament. The concerns were mainly related to the mandatory approach taken by the government, and the high frequency of the reading intervals, because, according to a study commissioned by the Dutch Consumers' Association, these features were not considered necessary in a democratic society and thus, could not withstand the "privacy test" laid down in Article 8 of the European Convention of Human Rights.[84] The negative reactions forced the Dutch government to adjust the proposed legislation using a less stringent approach (voluntary installation and the possibility to choose between different reading frequencies).

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[82] For a detailed analysis of this issue, see Cuijpers and Koops (n 20); Robin Anna Hoenkamp, 'Safeguarding EU Policy Aims and Requirements in Smart Grid Standardization' (PhD Dissertation, University of Amsterdam 2015) <https://pure.uva.nl/ws/files/2491454/158793_Hoenkamp_Thesis_complete_.pdf> accessed 10 October 2018 section 2.4.

[83] Cuijpers and Koops (n 20).

[84] Colette Cuijpers and Bert-Jaap Koops, 'The "Smart Meters" Bill: A Privacy Test Based on Article 8 of the ECHR' (Tilburg University 2008) Study commissioned by the Dutch Consumers' Association <https://skyvisionsolutions.files.wordpress.com/2014/11/dutch-smart-meters-report-tilt-october-2008-english-version.pdf> accessed 11 October 2018.

Against this background, introducing SWM in the Netherlands would require additional rules that deal properly with the challenges that such technology creates vis-`a-vis the protection of consumer privacy. As explained by Cuijpers and Koops (2013), a major aspect to consider is that more intrusive approaches (e.g., mandatory installation of SWM and high frequency measurements and readings by the utility company) require more substantiation and empirical evidence to justify the interference with the right to privacy.[85]



An additional issue relates to the protection of personal data. Since the data generated by SWM can be traced back to an identifiable natural person (the consumer), it qualifies in principle as personal data under the meaning of the General Data Protection Regulation (known as the "GDPR")[86] in force in the European Union since May 2018. Among other aspects, the GDPR requires that all processing of personal data should be based on a lawful ground.[87] Since the metering currently serves the purposes of performing the contract of supply of drinking water concluded between the drinking water company and the consumer, it is likely that the current legal basis for the processing of such personal data is the performance of a contract.[88] However, some of the additional possibilities enabled by SWM may not have a direct link with the performance of the contract but serve other purposes (e.g., leak detection, better monitoring of the network). Therefore, a different basis for the processing of such data will probably be required.[89]

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[85] Cuijpers and Koops (n 20). For example, pressing social needs like water shortage might justify a mandatory installation of smart water meters (SWM), as occurs in the United Kingdom in certain areas considered as "water scarce", OECD (n 23) 110. In fact, the British government is already studying the possibility of enabling mandatory rollout of SWM also in areas without water stress, as part of a long-term plan to fight water scarcity in the country, National Infrastructure Commission, 'National Infrastructure Assessment' (National Infrastructure Commission 2018) <https://nic.org.uk/app/uploads/CCS001_CCS0618917350-001_NIC-NIA_Accessible-1.pdf> accessed 10 November 2018.

[86] Regulation (EU) 2016/679 of the European Parliament and of the Council of 27 April 2016 on the protection of natural persons with regard to the processing of personal data and on the free movement of such data, and repealing Directive 95/46/EC (General Data Protection Regulation), OJ L 119, 1.

[87] See Article 5, paragraph 1(a); and Article 6 of the GDPR.

[88] Article 6, 1(b), GDPR.

[89] For example, the Danish Energy Agency (Energistyrelsen) issued a communication in January of 2018 according to which the processing of personal data carried out via devices which allow for remote readings of water and heating utilities (smart meters) may have as legal basis the provisions in Article 6, paragraph 1, points (e) and (f) of the GDPR, that is, respectively, that the processing is necessary for the performance of a task carried out in the public interest and that the processing is necessary for the purposes of the legitimate interests pursued by the controller or by a third party, Energistyrelsen (n 19).

### 3.4.2. Macrolevel

As noted earlier (section 3.3.2.) at the moment, there are no specific legal or regulatory provisions that instruct the drinking water companies on how they should carry out the metering, even with traditional meters. Again, a reasonable explanation for this seems to be that the metering is nowadays used mainly for contractual purposes, thus, the metering is not seen as a means to achieve policy goals or public values of the drinking water sector.[90]

Although the lack of such provisions does not automatically mean that drinking water companies cannot rollout SWM, their existence could help to provide certainty to the drinking water companies that implementing this technology is allowed under the regulations of the sector (sections 3.2.3. and 3.3.1.).[91]

In addition to connecting the possibilities of SWM with the policy goals of the sector, adjusting the national regulatory framework might be also relevant to provide certainty regarding the scope of the responsibilities and rights of the different stakeholders involved. Firstly, to give some guidance regarding the goals that are intended to be achieved via the SWM (e.g., prompt leak detection, better monitoring of the network, consumption awareness, water conservation, etc.) and how these goals should be reflected in the technical aspects of the SWM. As explained by Hoenkamp (2015) in the context of electricity smart meters, the functionalities of such devices (determined via standards) ought to be coherent with the goals they are intended to serve.[92] In her

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[90] The possibilities enabled by SWM can be linked to the public values that according to the Dutch legislation must be safeguarded in the drinking water sector. For example, using SMW to facilitate leak detection and calculating water demand, may contribute to the continuity of the service or security of supply (Chapter IV of the Drinking Water Act; on security of supply see also Lavrijssen and Vitez (n 57) 13; Monika Ambrus, Herman Kasper Gilissen and Jasper van Kempen, 'Public Values in Water Law: A Case of Substantive Fragmentation?' (2014) 10 Utrecht Law Review 8, 28 <http://www.utrechtlawreview.org/articles/abstract/10.18352/ulr.266/> accessed 11 October 2018.). In addition, Dutch water companies are obliged to operate efficiently (Chapter V, Drinking Water Act). As explained earlier in this contribution, the efficiency in the drinking water sector is assessed by means of a benchmark, which specifically includes as indicators the control of leaks, meter reading, accuracy of the billing, and the elimination of disruptions (Chapter V of the Dutch Water Act and Chapter VI of the Dutch Drinking Water Decree, in particular, Article 57, both referring to the efficiency of the public drinking water supply), aspects which can be improved by using SWM. Moreover, SWM provides better insights on water consumption, which helps to create awareness among the consumers and promote rational use of drinking water, another public value related to this service, (Ambrus, Gilissen and Kempen 28).

[91] In the United Kingdom, for example, some policy documents have been published by the government giving a clear signal that smart metering, together with improvements in the infrastructure and other measures, will contribute to manage the water supply more effectively and reduce the risks of drought. National Infrastructure Commission (n 85); National Infrastructure Commission, 'Preparing for a Drier Future: England's Water Infrastructure Needs' (2018) <https://nic.org.uk/app/uploads/NIC-Preparing-for-a-Drier-Future-26-April-2018.pdf>.

[92] Hoenkamp (n 82).

analysis of the rollout of electricity smart meters in the Netherlands, she explains that the functionalities initially established for the electricity smart meters did not allow to materialize the European Union policy aim of encouraging end-user energy efficiency, which was supposed to be the main motivation behind the rollout of the smart meters. This was the case because the adopted technical standard did not include functionalities (e.g., a display) to increase the consumption awareness of consumers. [93]



In addition, a clear indication of the goals to be pursued with SWM is necessary to exclude unwanted functionalities.[94] In this sense, additional rules at the macrolevel could contribute to steer the rollout of SWM in a way that the benefits are maximized (section 3.2.2.).

Second, macrolevel rules could also provide guidance regarding the way the goals of SWM ought to be balanced against the rights to privacy and protection of personal data of the consumers. As explained earlier, certain approaches (e.g., mandatory rollout, sub-hour reading frequency) might be more intrusive for the private life of the consumers and therefore would require more justification of their proportionality and necessity in a democratic society.[95] Given that the Dutch state has the positive obligation of ensuring effective respect of private and family life laid down in Article 8 of the ECHR,[96] some guidance might be necessary to ensure that the rollout of SWM does not constitute an illegitimate interference with the right to privacy of the consumers, especially considering that they are "captive" consumers.

Similar considerations apply for the protection of personal data. Guidelines regarding the legal grounds for processing and what kind of purposes are considered necessary to attain the goals of using SWM would contribute to provide certainty to the drinking water companies regarding their possibilities of action and at the same time contribute to the protection of consumers' personal data. In this respect, additions to the national regulatory framework might be necessary to limit the new harms or risks introduced with SWM (section 3.2.2.).

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[93] Hoenkamp (n 82) 31.

[94] Vlaamse Milieumaatschappij, 'Verkennend Onderzoek "Slimme Watermeters"' (Vlaamse Milieumaatschappij 2017) <https://www.vmm.be/publicaties/verkennend-onderzoek-slimme-watermeters> accessed 11 October 2018.

[95] Cuijpers and Koops (n 84).

[96] Council of Europe/European Court of Human Rights, 'Guide on Article 8 of the European Convention on Human Rights' (Council of Europe/European Court of Human Rights 2018) 8 <https://rm.coe.int/guide-on-article-8-of-the-european-convention-on-human-rights/16808e67cb> accessed 10 November 2018.

Finally, macrolevel rules could also help to adequately plan the rollout of SWM, bearing in mind that implementing SWM may involve high investments[97] and the costs of the drinking water sector are currently covered by the tariff charged to the consumers (sections 3.2.2. and 3.3.1.). Macrolevel rules may contribute to structure the rollout in a way that the affordability of drinking water in the Netherlands is not endangered, while giving the drinking water companies enough room to make the necessary investments to implement SWM. The latter may require aligning or giving certain flexibility to the current regulatory instruments in place, described in section 3.3.1.

Interestingly, recent research carried out in the Netherlands suggests that some of the regulatory instruments of the sector above explained might require certain improvement. A 2016 study that surveyed seven of the Dutch drinking water companies about the sector's benchmark found that according to these companies, "the current regulatory system and institutional interactions force them to value the financial aspect as very severe".[98] According to the study, when the financial pressure is high, benchmarking might obstruct innovation in the sector, because the comparison exercise "rewards the reproduction of the known," reducing the learning effect of the regulatory instrument.[99]

Furthermore, the evaluation of the efficiency of the Drinking Water Act commissioned by the Ministry of Infrastructure and Water Management (published in August 2017) also concluded that there is room for improvement of the current regulatory instruments, and recommended, among others, investigating possible undesirable effects of the WACC as it is currently being determined by the Ministry, and carrying out periodical independent research into the efficiency and investment task.[100]

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[97] Arniella (n 13); Hug March and others, 'Household Smart Water Metering in Spain: Insights from the Experience of Remote Meter Reading in Alicante' (2017) 9 Sustainability <https://www.mdpi.com/2071-1050/9/4/582> accessed 5 February 2020.

[98] Marieke de Goede and others, 'Drivers for Performance Improvement Originating from the Dutch Drinking Water Benchmark' (2016) 18 Water Policy 1247, 12 <https://iwaponline.com/wp/article/18/5/1247/20240/Drivers-for-performance-improvement-originating> accessed 8 October 2020.

[99] de Goede and others (n 98) 12.

[100] Andersson Elffers Felix (n 68).

## 3.5. Conclusions

This study is a first exploration of possible regulatory challenges of introducing SWM in the Netherlands. The most important observation resulting from this study is that the current regulatory frameworks of the drinking water sector are still based on the assumption that metering only serves for the purposes of determining the consumption of water, as part of the performance of the supply contracts between drinking water companies and consumers. The additional uses of smart metering as a valuable source of data for the management of the network are not yet present in the current rules, nor the challenges that the use of SWM can create for the protection of privacy and personal data of consumers.

The need to revisit the existing rules to implement SWM is easier to pinpoint at the microlevel (rules governing the metering) than at the macrolevel (general rules of the drinking water sector), but that does not mean that the latter requires less attention. Dutch drinking water companies operate in a highly regulated sector and as such their possibilities of action are largely determined by the regulations in place, including the supervisory instruments. These circumstances may create challenges for the implementation of SWM that are less explicit but nevertheless relevant.

More empirical research is necessary to assess to which extent the national regulatory framework in place in the Dutch drinking water sector facilitates or hinders the implementation of SWM. Further research would be also required to investigate more specific regulatory challenges of implementing SWM, such as the governance of the system, in terms of who ought to be responsible for the installation and operation of the SWM, and the processing of the collected data. In this regard, some questions to consider are: should this be a task carried out by the drinking water companies or should there be a separate organization in charge of this? Who should be entitled to access SWM data and for which purposes? Will there be room for the creation of additional services for the water consumers based on the data generated by SWM? If so, who should be allowed to provide such services and under what conditions?

With this exploratory study, we also aim to start a discussion at a broader level, regarding the regulatory challenges that appear as a result of the increasing digitalization of infrastructure in the drinking water sector.

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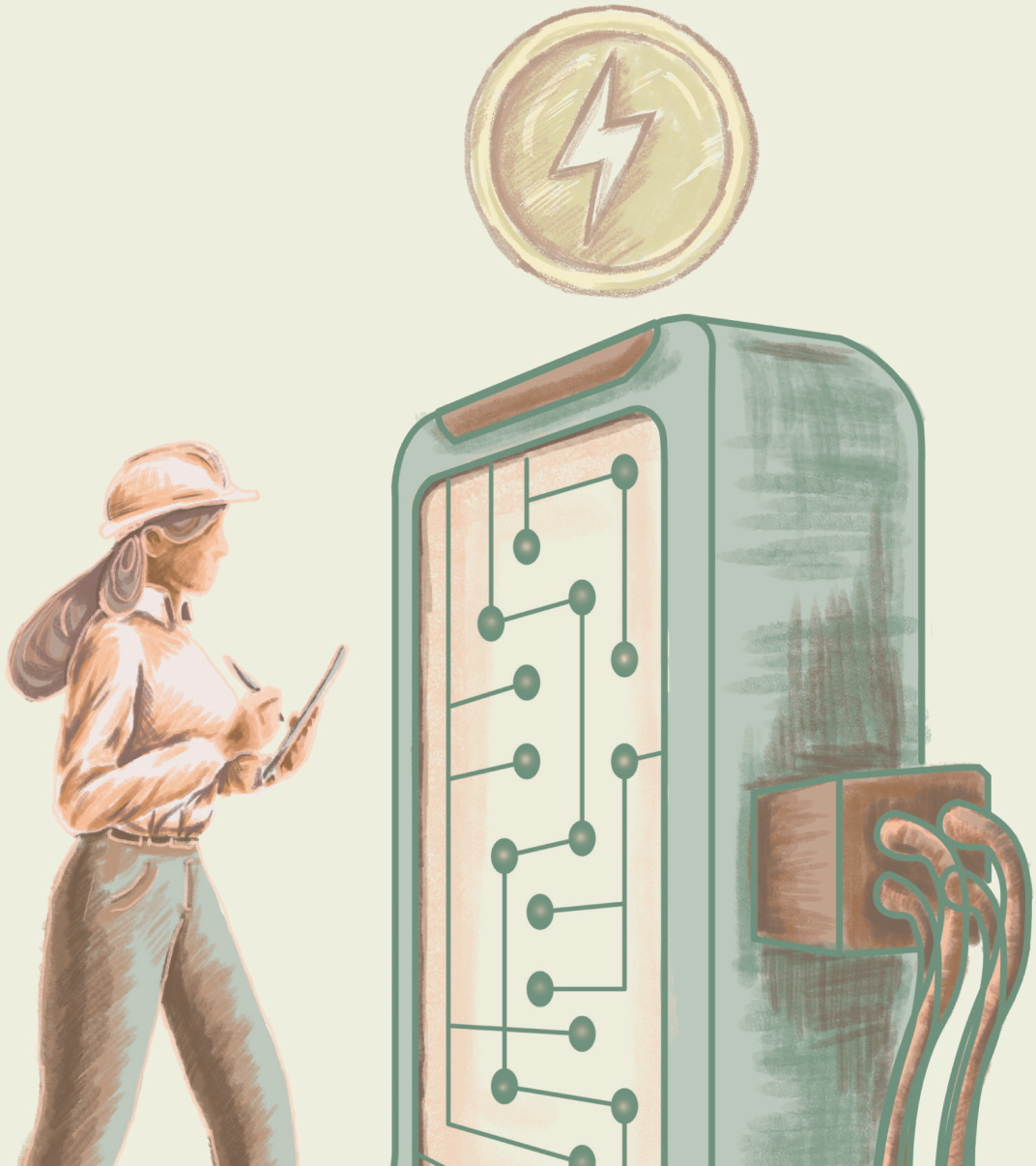
'Voorjaar en zomer van 2018 tot nu toe de droogste ooit gemeten' (RTL Nieuws, 24 July 2018) <https://www.rtlnieuws.nl/nieuws/nederland/artikel/4303756/voorjaar-en-zomer-van-2018-tot-nu-toe-de-droogste-ooit-gemeten> accessed 11 October 2018

'Waterbeschikbaarheid En de Waterketen' (De staat van ons water, 2018) <http://www.destaatvanonswater.nl/waterbeschikbaarheid-en-de-waterketen> accessed 11 October 2018



# CHAPTER 4

# The challenges of sharing data at the intersection of EU data protection and electricity legislation: Lessons from the Netherlands. *

**Original manuscript of the article:*

Brenda Espinosa Apráez, 'The Challenges of Sharing Data at the Intersection of EU Data Protection and Electricity Market Legislation: Lessons from the Netherlands.' [Forthcoming] Journal of Energy & Natural Resources Law.

## 4.1 Introduction

As a result of the increasing digitalization of the electricity sector[1] in the European Union (EU) and the crucial role of energy data in the EU Data Strategy,[2] there is a growing interest in access to consumer data in the electricity sector and beyond. Different actors require access to consumer data for different purposes. On the one hand, access to consumer data is necessary for the correct functioning of the electricity systems and to secure the supply of electricity. Actors such as Distribution System Operators (DSOs) and energy suppliers must collect and exchange consumer data to fulfil the regulatory obligations introduced by EU and national law to ensure the reliable, affordable, and sustainable supply of electricity. On the other hand, access to consumer data is becoming crucial to enable new energy services which go beyond the mere supply of electricity, such as personalized offers, demand response programs or energy management systems. These services allow consumers to manage their energy use and be more active in the electricity market and the energy transition.[3] There is also potential to enable services across different economic sectors (e.g., the financial sector) on the basis of energy data.[4] To be able to offer these services to the consumers, service providers need access to consumer data.

The growing importance of access to consumer data is acknowledged by the Directive (EU) 2019/944 (hereinafter the 'Recast Electricity Directive'). This legislation requires Member States to lay down rules regarding data management and exchange,[5] in

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1 On the digitalization of the electricity sector, see Nicolò Rosetto and Valerie Reif, 'Digitalization of the Electricity Infrastructure: A Key Enabler for the Decarbonization and Decentralization of the Power Sector' in Juan Montero and Matthias Finger (eds), *A Modern Guide to the Digitalization of Infrastructure* (Edward Elgar Publishing 2021) <https://doi.org/10.4337/9781839106057> accessed 28 January 2022.

2 European Commission, 'Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions "A European Strategy for Data"' (European Commission 2020) COM/2020/66 final <https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX%3A52020DC0066>. One of the initiatives proposed by the European Commission in this strategy is the creation of "common European data spaces" in strategic sectors, including the energy sector. The energy data space is aimed at promoting "stronger availability and cross-sector sharing of data, in a customer-centric, secure and trustworthy manner, as this would facilitate innovative solutions and support the decarbonisation of the energy system" (p. 22). For further reading on the concept and state of play of the common European data spaces in early 2022, see European Commission, 'Commission Staff Working Document on Common European Data Spaces' (2022) SWD(2022) 45 final <https://digital-strategy.ec.europa.eu/en/library/staff-working-document-data-spaces> accessed 1 April 2022.

3 See Recital 5 of the Directive (EU) 2019/944 of the European Parliament and of the Council of 5 June 2019 on common rules for the internal market for electricity and amending Directive 2012/27/EU, OJ L158/125 (hereinafter, the "Recast Electricity Directive").

4 See e.g., the Green Loans initiative in the Netherlands in Data Sharing Coalition, 'Green Loans' (*Data Sharing Coalition*) <https://datasharingcoalition.eu/use-cases/sharing-energy-information-with-mortgage-providers-to-include-in-mortgage-applications/> accessed 4 January 2022.

5 Article 23, Recast Electricity Directive.

particular, rules on access to data of the consumer,[6] which include "metering and consumption data as well as data required for customer switching, demand response and other services".[7]

The Recast Electricity Directive also requires Member States to "organise the management of data in order to ensure efficient and secure data access and exchange, as well as data protection and data security".[8] Concerning data protection, the Directive stipulates that when personal data are processed (including giving or obtaining access to personal data), this should be done in compliance with Regulation (EU) 2016/679,[9] known as the General Data Protection Regulation (GDPR).[10] Against this backdrop, the sharing of consumer data in the electricity sector is to be governed by two simultaneously applicable regimes: on the one hand, the sectoral rules laid down by Member States in transposition of the Recast Electricity Directive; and on the other hand, the general framework for personal data processing enshrined in the GDPR.



These two frameworks have different scopes, legal bases in EU law, policy objectives, levels of implementation and supervisory authorities.[11] Moreover, each of these two legal frameworks defines different roles, obligations, and rights that apply simultaneously to the same actors. For example, electricity consumers whose data are accessed are also data subjects, and as such, are entitled to the protection and rights arising from both the Recast Electricity Directive and the GDPR. Parties

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[6] Article 23 of the Recast Electricity Directive does not use the term 'consumer' but 'final customer'. 'Final customer' is a broad notion encompassing both natural and legal persons, defined in the Directive as 'a customer who purchases electricity for own use' (Article 2(1), Directive (EU) 2019/944). The term 'consumer' will be used in this contribution instead of 'final customer' for practical reasons. Firstly, even if the Recast Electricity Directive does not list 'consumer' as one of the definitions in Article 2, it does use the expression throughout its text. In fact, Article 23 is under Chapter III of the Directive, entitled "CONSUMER EMPOWERMENT AND PROTECTION". Secondly, the term 'consumer' is defined in EU legislation on consumer protection as any *natural person* acting for purposes outside their trade, business, craft or profession (see e.g., Directive 2005/29/EC concerning unfair business-to-consumer commercial practices in the internal market and Directive 2011/83/EU on consumer rights). This research focuses on the interplay between electricity market legislation and personal data protection legislation, the latter applicable to the processing of data relating to *natural persons*. Hence, the term 'consumer' seems more precise and suitable than that of 'final customer' for the purposes of this contribution.

[7] Article 23, par. 1, Recast Electricity Directive.

[8] Article 23, par. 2, Recast Electricity Directive.

[9] Article 23, par. 3, Recast Electricity Directive.

[10] Regulation (EU) 2016/679 of the European Parliament and of the Council of 27 April 2016 on the protection of natural persons with regard to the processing of personal data and on the free movement of such data, and repealing Directive 95/46/EC (General Data Protection Regulation), OJ L119/1.

[11] In this regard, see Saskia Lavrijssen, Brenda Espinosa Apráez and Thijs ten Caten, 'The Legal Complexities of Processing and Protecting Personal Data in the Electricity Sector' (2022) 15 Energies 1088 <https://www.mdpi.com/1996-1073/15/3/1088> accessed 1 April 2022.

responsible for data management (hereinafter 'data managers') can also qualify as data controllers or data processors and have to comply with the correlative obligations under the GDPR, in addition to their obligations as managers of energy data. The parallel application of these two legal frameworks raises questions, as noted by emerging legal scholarship on this topic.

Huhta (2020) explores how the objectives of both regimes can be reconciled through legal interpretation, even if they seem to embody opposing interests: on the one hand, the extensive use of smart meter data encouraged by the Recast Electricity Directive, and on the other hand, the view of processing and transferring personal data as a potential threat to the right to data protection, embedded in the GDPR.[12] The core of her analysis, however, focuses on possible grounds for personal data processing in the context of smart metering, without delving into questions related to access to consumer data.

The work of Graef, Husovec & van den Boom (2020) does study the provisions for access to consumer data in the Recast Electricity Directive (as well other sectoral data access regimes in EU legislation), but focuses specifically on exploring the spillovers that may result from its interaction with the right to data portability introduced by the GDPR.[13] They find that the interplay between these frameworks can affect how they are interpreted, in the sense that the reach of the provisions of one framework may expand or contract when read together with the other framework.

A recent study by Lavrijssen, Espinosa Apráez and ten Caten (2022) also looks at the interplay between the GDPR and the Recast Electricity Directive. Their contribution provides an overview of the different actors, principles and obligations arising from each legal regime, and identifies three possible tensions between the two frameworks.[14] These tensions, however, are not fully developed in that study, leaving room for further exploration.

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[12] Kaisa Huhta, 'Smartening up While Keeping Safe? Advances in Smart Metering and Data Protection under EU Law' (2020) 38 Journal of Energy & Natural Resources Law 5 <https://doi.org/10.1080/02646811.2019.1622244>.

[13] Inge Graef, Jasper van den Boom and Martin Husovec, 'Spill-Overs in Data Governance: Uncovering the Uneasy Relationship Between the GDPR's Right to Data Portability and EU Sector-Specific Data Access Regimes' (2020) 9 Journal of European Consumer and Market Law 3 <https://kluwerlawonline.com/journalarticle/Journal+of+European+Consumer+and+Market+Law/9.1/EuCML2020002>.

[14] "The first tension lies in the fact that some of the innovations facilitated by smart metering in the energy sector rely on technologies that might not be entirely compatible with the GDPR. A second tension follows from the existence of separate but interrelated regimes for access to data of the consumer/data subject in the two legal instruments here analysed. The third tension relates to a possible overlap of competences between the supervisory authorities of both regimes." Lavrijssen, Espinosa Apráez and ten Caten (n 11) 1.

The aforementioned studies analyze the interplay between the GDPR and the provisions concerning data access in the Recast Electricity Directive, but do so *in abstracto*. With the aim of expanding the body of knowledge on the challenges of applying these two frameworks simultaneously, this research brings insights from practice, by examining a case from the Dutch electricity sector (hereinafter, 'the Personalized Offer case').

The 'Personalized Offer case' is constructed around the context, content and consequences of a ruling issued by a Dutch Court, the Trade and Industry Appeals Tribunal (in Dutch: *College van Beroep voor het Bedrijfsleven*, hereinafter 'CBb') in early 2020.[15] The ruling put forward an interpretation concerning one of the lawful grounds for personal data processing under the GDPR (necessity to comply with a legal obligation), that led Dutch Distribution System Operators (DSOs) to stop giving energy suppliers access to consumer data to prepare personalized offers.[16]

Even though the case took place before the adoption of the Recast Electricity Directive, its analysis is still relevant. Firstly, because it refers to the interaction between the GDPR and the sectoral rules for access to consumer data in force in the Netherlands at the time of the events, providing rich insight into the challenges of applying horizontal and sectoral frameworks regulating data sharing. Secondly, and more importantly, the issues arising from the case are not addressed by the Recast Electricity Directive.

The question that underlies this research is the following: what lessons can be drawn from the Personalized Offer case regarding the interplay of the GDPR and the rules for access to consumer data in the electricity sector? The aim of this chapter is twofold. Firstly, this chapter reflects on what ocurred in the Dutch case and shows that the lack of alignment between the legal regime for access to consumer data in the electricity sector and data protection legislation might end up hindering data sharing in the electricity sector and/or jeopardizing the protection of personal data. Secondly, the article posits that Member States have an important role to play in contributing to the consistent application of the two legal frameworks, and introduces a number of suggestions in that regard, focusing on two main issues: ensuring substantive legal alignment between the two legal frameworks, and the importance of having clear cooperation mechanisms between the energy regulators and the data protection authorities.[17]

[15] *College van Beroep voor het Bedrijfsleven*, ruling of 14 January 2020, cases 18/2783 and 18/2846, NJB 2020/245, ECLI:NL:CBB:2020:3, available online https://uitspraken.rechtspraak.nl/inziendocument?id=ECLI:NL:CBB:2020:3. Hereinafter, 'CBb ruling'.

[16] See section 4.3.1. of this chapter for further explanation of what a 'personalized offer' entails.

[17] For further explanation, see section 4.4 of this chapter.

This research is carried out following the methodological approach of doctrinal legal research, based on an analysis of EU and Dutch legal sources (specified throughout the article), as well as legal scholarship on data protection and access to consumer data in the electricity sector.

The chapter is structured as follows: Part 4.2 will provide an overview of the provisions governing access to consumer data in the Recast Electricity Directive and will elaborate on their relationship with the GDPR. Part 4.3 describes the facts of the Personalized Offer case. Part 4.4 will identify the learnings from the case, as well as suggestions to enhance the alignment between the two legal regimes here studied. Part 4.5 concludes.

## 4.2. The regime for access to consumer data under the Recast Electricity Directive and its relationship with the GDPR.

### 4.2.1 Access to consumer data under the Recast Electricity Directive

In the electricity sector a distinction is usually made between access to data necessary to fulfil regulatory obligations, and access to data necessary for additional energy services.[18] The first category refers to the exchange of data for processes that are necessary for the correct functioning of the electricity systems and the continuous supply of electricity. For example, energy suppliers need access to consumer data, among others, for billing purposes and for switching (i.e., when the consumer wants to change supplier). These are traditional processes involved in the supply of electricity and have been regulated for a long time.

The increased availability of consumer data, owing in particular to the rollout of smart metering systems,[19] has enabled the emergence of new energy services that help consumers in "monitoring their consumption patterns, consuming green energy, activating their flexibility, generating energy locally, driving electric vehicles, etc."[20] To be able to offer these services to the consumers, service providers need

[18] See e.g., Copenhagen Economics and VVA Europe, 'Impact Assessment Support Study on: "Policies for DSOs, Distribution Tariffs and Data Handling"' (Publications Office of the European Union 2016) 37–38 <https://ec.europa.eu/energy/sites/ener/files/documents/ce_vva_dso_final_report_vf.pdf> accessed 10 May 2022; EURELECTRIC, 'The Power Sector Goes Digital - Next Generation Data Management for Energy Consumers' (EURELECTRIC 2016) 8 <https://www.eurelectric.org/media/2029/joint_retail_dso_data_report_final_11may_as-2016-030-0258-01-e.pdf> accessed 10 May 2022.(p. 37-38).

[19] Art. 2 (23) Recast Electricity Directive: "'smart metering system' means an electronic system that is capable of measuring electricity fed into the grid or electricity consumed from the grid, providing more information than a conventional meter, and that is capable of transmitting and receiving data for information, monitoring and control purposes, using a form of electronic communication".

[20] Council of European Energy Regulators, 'CEER Report on Innovative Business Models and Consumer

access to consumer data, especially smart meter data, which in the EU are typically managed by or on behalf of DSOs.[21] This new use of data reflects the growing impact of the data economy in the electricity sector, and it is gaining momentum in EU policy, both in the Digital agenda and in the Energy agenda.[22]

Acknowledging the importance of consumer data, the Recast Electricity Directive explicitly requires Member States to lay down rules for access to these data by eligible parties and sets a number of requirements that those rules must meet.[23] Such emphasis on access to consumer data was absent in the preceding legislation adopted under the Third Energy Package. Directive 2009/72/EC[24] (hereinafter 'Electricity Directive 2009') had already encouraged Member States to embrace and support the use of information and telecommunication technologies (ICT), such as smart grids and smart metering, to foster decentralized generation and energy efficiency.[25] However, the Electricity Directive 2009 provided limited provisions regarding how the new streams of data resulting from these technologies should be managed and accessed. Regarding consumer data, the 2009 Directive stated that Members States should take measures to ensure that consumers could have at their disposal their consumption data and give any energy supplier access to their metering data free of charge.[26]



Protection Challenges' (CEER 2021) C20-CRM-DS-03–03 13 <https://www.ceer.eu/documents/104400/-/-/44055630-31dc-d3da-386a-a6edfec24eb1> accessed 10 May 2022.

21 European Commission, 'Commission Staff Working Document - Impact Assessment Accompanying the Document Proposal for a Directive of the European Parliament and of the Council on Common Rules for the Internal Market in Electricity (Recast) [and Others]' (European Commission 2016) SWD (2016) 410 final 455 <https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:52016SC0410&from=EN> accessed 10 May 2022 (Part 5/5).

22 See e.g., European Commission, Directorate General for Energy, 'Action Plan on the Digitalisation of the Energy Sector' (European Commission 2021) Roadmap Ares(2021)4720847 <https://ec.europa.eu/info/law/better-regulation/have-your-say/initiatives/13141-Action-plan-on-the-digitalisation-of-the-energy-sector_en> accessed 10 May 2022; European Commission, 'A European Strategy for Data, COM/2020/66 Final' (n 2).

23 Article 23, Recast Electricity Directive.

24 Directive 2009/72/EC of the European Parliament and of the Council of 13 July 2009 concerning common rules for the internal market in electricity and repealing Directive 2003/54/EC, OJ L 211, 14.8.2009, p. 55–93.

25 See Recital 27 and Art. 3, par. 11 of the Electricity Directive 2009.

26 Electricity Directive 2009, Annex I, 1(h).

In the review of the Electricity Directive 2009 in preparation of the Clean Energy Package,[27] data management (including access to consumer data)[28] was seen as one of the main factors behind the "slow deployment of new services, low levels of service and questionable market performance on retail markets" in the EU electricity sector.[29] The Impact Assessment prepared by the European Commission for the recast of the Electricity Directive 2009 acknowledged that in order to realize the benefits offered by digitalization in the electricity sector, a framework for non-discriminatory data management was needed. This, in order to make "the right information immediately available to the right market actors, while at the same time ensuring a high level of data protection."[30] In the view of the Commission, this called for legislative action at EU level.

The approach ultimately adopted in the Recast Electricity Directive regarding data management entails that Member States are free to have their own model for data management and exchange,[31] i.e., the Directive does not require Member States to adopt a predetermined model.[32] Regardless of the specific model chosen, Member States are responsible for organizing data management as to ensure non-discriminatory, efficient and secure data access, and the highest level of cybersecurity and data protection.[33] The rules concerning access to consumer data shall be transparent and

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[27] The Clean Energy package is a set of legislative measures proposed by the European Commission in 2016, aimed to help "[moving] away from fossil fuels towards cleaner energy - and, more specifically, to deliver on the EU's Paris Agreement commitments for reducing greenhouse gas emissions". See European Commission, 'Clean Energy for All Europeans Package' (*Energy*, n.d.) <https://energy.ec.europa.eu/topics/energy-strategy/clean-energy-all-europeans-package_en> accessed 10 May 2022.

[28] A data management model can be understood as the "technical model through which data is sourced, validated, stored, protected and processed, and through which it can be accessed". Council of European Energy Regulators, 'Review of Current and Future Data Management Models' (CEER 2016) CEER Report C16-RMF-89–03 9 <https://www.ceer.eu/documents/104400/-/-/1fbc8e21-2502-c6c8-7017-a6df5652d20b> accessed 10 May 2022. In this sense, data management is the broader notion which encompasses different data processes, including data access.

[29] Title of Problem Area IV in the Impact Assessment of the Electricity Directive 2019. European Commission, 'Impact Assessment Recast Electricity Directive SWD (2016) 410 Final' (n 21) 70 (Part 1/5).

[30] European Commission, 'Impact Assessment Recast Electricity Directive SWD (2016) 410 Final' (n 21) 5 (Part 1/5).

[31] For an overview of the types of data management models that Member States have adopted in the past, see Council of European Energy Regulators (n 28); European Commission, Directorate General for Energy and others, 'Format and Procedures for Electricity (and Gas) Data Access and Exchange in Member States' (Publications Office of the European Union 2020) <https://data.europa.eu/doi/10.2833/719689> accessed 7 June 2021.

[32] This was, however, one of the options considered by the European Commission in the Impact Assessment, see European Commission, 'Impact Assessment Recast Electricity Directive SWD (2016) 410 Final' (n 21) 457 (Part 5/5).

[33] Article 23, par. 3 of the Recast Electricity Directive specifies that the processing of personal data pursuant to the Electricity Directive 2019, shall be carried out in accordance with the GDPR.

ensure the impartiality of the parties responsible for data management (hereinafter 'the data managers'), which are obliged to give access to consumer data to eligible parties, in accordance with the data access rules adopted in each Member State. [34]

The Recast Electricity Directive does not define the meaning of 'eligible parties'. In the original legislative proposal prepared by the European Commission, Article 23, par. 1 stated that 'eligible parties' shall include "at least customers, suppliers, transmission and distribution system operators, aggregators, energy service companies, and other parties which provide energy or other services to customers".[35] Since this provision is not included in the adopted text of the Directive, it is up to the Member States to decide which parties are eligible to have access to data of the consumer.

The consumer data covered by the Directive include "metering and consumption data, data required for customer switching, demand response and other services".[36] In that sense, the scope of the provisions concerning data access in the Recast Electricity Directive is broader than the one of the 2009 Directive, which only referred to access to metering data by suppliers.

From the types of data mentioned in the Directive (i.e., metering and consumption data, data required for switching, demand response and other services), metering data and consumption data receive most attention. The Directive does not provide specific definitions for these two types of data, but from its provisions[37] it seems that 'metering data' is a broader notion referring to data generated by smart meters, [38] including information on how much electricity is consumed (consumption data) and how much electricity is fed into the grid, in the case of active customers (also known as 'prosumers').

The rules applicable to access to smart meter data are laid down in Article 20 of the Recast Electricity Directive. According to these provisions, consumers are entitled to receive (at no additional cost) validated historical consumption data[39]

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[34] Article 23, par. 2, and recital 57 of the Recast Electricity Directive.

[35] European Commission, 'Proposal for a Directive of the European Parliament and of the Council on Common Rules for the Internal Market in Electricity (Recast)' (2017) COM(2016) 864 final/2 2016/0380(COD) <https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX%3A52016PC0864R%2801%29> accessed 10 May 2022.

[36] Art. 23, par 1, Recast Electricity Directive

[37] See in particular Art. 20 of the Recast Electricity Directive.

[38] See Council of European Energy Regulators (n 20) 35.

[39] Regarding access to complementary information on historical consumption, see Annex I, Section 4 of the Recast Electricity Directive.

and non-validated near-real time consumption data[40], the latter "in order to support automated energy efficiency programmes, demand response and other services".[41] Article 20, literal (e) specifies that, at the request of the consumers, consumption data and data on the electricity fed into the grid shall be made available to them, following the provisions of the implementing acts adopted pursuant to Article 24 of the Directive. This Article gave powers to the European Commission to adopt implementing acts on "interoperability requirements and non-discriminatory and transparent procedures for access to data referred to in Article 23(1)".[42] The goal of these implementing acts is promoting competition in the EU retail market for electricity and avoiding excessive administrative costs for the eligible parties seeking access to data in multiple Member States.[43] The interoperability requirements and procedures introduced by the implementing acts must be based on national practices.

Under the Recast Electricity Directive, access to consumer data can take two forms: the data can be made available directly to the consumer through a communication interface or remote access, and the data can be made available to a third party acting on behalf of the consumer.[44] The last subsection of Article 20 specifies that consumers should be able to "retrieve their metering data or transmit them to another party at no additional cost and in accordance with their right to data portability under Union data protection rules".

The right to data portability was introduced by the GDPR (Article 20). It entitles the data subjects to receive (a copy of the) personal data concerning them that have been provided by them to a data controller,[45] in a "structured, commonly used and

[40] 'Near real time' means "a short time period, usually down to seconds or up to the imbalance settlement period in the national market", Art. 2(26) Recast Electricity Directive.

[41] Art. 20(a), Recast Electricity Directive.

[42] Article 24, par. 2. The implementing acts must be adopted following the comitology procedure referred to in Article 68, par. 2 of the Electricity Directive 2019. At the moment of writing (April 2022), the implementing acts on interoperability and procedures for access to data under the Recast Electricity Directive 2019 have not been adopted yet. It is expected that the first implementing act(s) will be adopted in the third quarter of 2022. See European Commission, 'Access to Electricity Metering and Consumption Data – Requirements' (*European Commission - Law*, n.d.) <https://ec.europa.eu/info/law/better-regulation/have-your-say/initiatives/13200-Access-to-electricity-metering-and-consumption-data-requirements_en> accessed 11 May 2022.

[43] Article 24, par. 1, Recast Electricity Directive. The interoperability requirements and procedures introduced by the implementing acts must be based on national practices (Article 24, par. 3).

[44] Article 20, literal (e), Recast Electricity Directive.

[45] Following the guidelines on the right to data portability issued by the Article 29 Working Party (a former EU advisory body in the area of personal data protection, replaced by the European Data Protection Board under the GDPR) data 'provided by the data subject' include data that have been actively provided by the data subject, as well as data that have been "observed from the activities of users such as raw data processed by a smart meter or other types of connected objects". Article 29 Data Protection Working Party, 'Guidelines on the Right to Data Portability (Adopted on 13 December 2016, as Last Revised and Adopted

machine-readable format", and to transmit the data to another controller or, where technically feasible, have the data transmitted directly from the original controller to a new controller.[46] This right is aimed at empowering data subjects by facilitating that they can "move, copy or transmit personal data easily from one IT environment to another (whether to their own systems, the systems of trusted third parties or those of new data controllers)".[47] Several commentators note that the Recast Electricity Directive can be seen as complementing the GDPR, by introducing a mandatory implementation of the right to data portability for smart meter data.[48]



### 4.2.2 Relationship between the rules on access to consumer data and the GDPR

The GDPR is an EU regulation applicable since May 2018. It is aimed at safeguarding the right to personal data protection, while making possible that personal data can be processed and flow freely between Member States.[49] This Regulation requires individuals and organizations that process personal data as controllers[50] or processors[51] to implement technical and organizational measures to comply with data protection rules and principles.

The GDPR is a general legal framework for the protection of personal data in the EU. It applies to all personal data processing activities and sectors that are not explicitly

on 5 April 2017)' (2017) WP 242 rev.01 9–10 <https://ec.europa.eu/newsroom/article29/items/611233/en> accessed 11 May 2022.

[46] For further reading on the right to data portability, see Article 29 Data Protection Working Party (n 45); Paul De Hert and others, 'The Right to Data Portability in the GDPR: Towards User-Centric Interoperability of Digital Services' (2018) 34 Computer Law & Security Review 193 <https://www.sciencedirect.com/science/article/pii/S0267364917303333> accessed 11 May 2022; Inge Graef, Martin Husovec and Nadezhda Purtova, 'Data Portability and Data Control: Lessons for an Emerging Concept in EU Law' (2018) 19 German Law Journal 1359 <https://www.cambridge.org/core/journals/german-law-journal/article/data-portability-and-data-control-lessons-for-an-emerging-concept-in-eu-law/5904FB88DDC1B9E6EC651A7F89058433> accessed 11 May 2022; Graef, van den Boom and Husovec (n 13).

[47] Article 29 Data Protection Working Party (n 45) 4.

[48] See e.g., Graef, van den Boom and Husovec (n 13); Richard Feasey and Alexandre de Streel, 'Data Sharing for Digital Markets Contestability: Towards a Governance Framework' (CERRE 2020) <https://cerre.eu/publications/data-sharing-digital-markets-competition-governance/> accessed 11 May 2022; Heike Schweitzer and Robert Welker, 'A Legal Framework for Access to Data – A Competition Policy Perspective' in German Federal Ministry of Justice and Consumer Protection and Max Planck Institute for Innovation and Competition (eds), *Data Access, Consumer Interests and Public Welfare* (1st edn, Nomos Verlagsgesellschaft mbH & Co KG 2021) <https://doi.org/10.5771/9783748924999-103> accessed 11 May 2022.

[49] Article 1 and Recital 170, GDPR.

[50] A controller is a natural or legal person, public authority or agency which (alone or jointly with others) determines the purposes and means of the processing of personal data, or which has been nominated as controller by EU or Member State law. See Article 4 (7) GDPR.

[51] 'Processor' means "a natural or legal person, public authority, agency or other body which processes personal data on behalf of the controller". Article 4 (8) GDPR.

excluded from its scope.[52] The GDPR applies to the processing of consumer data in the electricity sector to the extent that the data in question qualify as personal data following the definition in the GDPR, i.e., any information that relate to identified or identifiable natural persons (named 'data subjects' in the GDPR).[53].The GDPR defines 'processing' as "any operation or set of operations which is performed on personal data or on sets of personal data, whether or not by automated means", including "retrieval, consultation, use, disclosure by transmission, dissemination or otherwise making available".[54] Hence, giving and receiving access to data relating to consumers who are natural persons are activities that qualify as processing of personal data under the GDPR.

The Recast Electricity Directive clearly acknowledges that the GDPR applies whenever personal data are processed under the provisions of the Directive. This is reasonable because the Directive was prepared and adopted after the entry into force of the GDPR in May 2016. It is also understandable considering that the electricity sector is becoming every time more dependent on the use and exchange of consumer data, which concern personal data and thus must be processed following the GDPR.[55]

Several recitals and provisions of the Recast Electricity Directive refer explicitly to the data protection legislation. For example, Recital 91 of the Recast Electricity Directive states that its provisions should be interpreted and applied in accordance with the rights and principles enshrined in the Charter of Fundamental Rights of the European Union, in particular the right to the protection of personal data.[56] Moreover, this Recital highlights that it is essential that any processing of personal data pursuant to the Directive complies with the GDPR, something that is reiterated in the provisions concerning smart metering,[57] and the provisions concerning data management and access to consumer data. [58] Another important link with the GDPR is evidenced by the explicit reference to the right to data portability in Article 20 of the Recast Electricity Directive referred above.

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[52] For the material and territorial scope of the GDPR, see Articles 2 and 3 of that Regulation.

[53] Article 4 (1), GDPR. As defined by the cited Article, "an identifiable natural person is one who can be identified, directly or indirectly, in particular by reference to an identifier such as a name, an identification number, location data, an online identifier or to one or more factors specific to the physical, physiological, genetic, mental, economic, cultural or social identity of that natural person", Article 4 (1) GDPR. For an explanation of why the processing of data collected by smart meters is subject to personal data protection legislation, see Article 29 Data Protection Working Party, 'Opinion 12/2011 on Smart Metering' (2011) WP 183 12 <https://ec.europa.eu/justice/article-29/documentation/opinion-recommendation/files/2011/wp183_en.pdf> accessed 11 May 2022.

[54] Article 4 (2), GDPR.

[55] Lavrijssen, Espinosa Apráez and ten Caten (n 11).

[56] Article 8 of the Charter of Fundamental Rights of the European Union [2012] OJ C 326/391.

[57] See Article 20, (c), (e) and (f), Recast Electricity Directive.

[58] See in particular Article 23, pars. 2 and 3 and Article 34 of the Recast Electricity Directive.

As noted in Section 4.2.1. of this chapter, one of the goals of the legislative reform that resulted in the adoption of the Recast Electricity Directive was to introduce new rules in order to enhance data access while ensuring personal data protection. The result in the adopted Directive was, however, more modest. It is true that the Directive makes a clear link with the GDPR stating explicitly that the latter is applicable whenever personal data are processed in the application of the Directive, including in the context of access to consumer data.[59] However, the Directive offers little guidance on how to apply both frameworks in parallel in the context of access to consumer data. This is understandable, considering that each Member State can adopt its own model for data management and exchange, and the divergences across models make it more difficult to introduce guidelines at EU level. In this context, it is for the Member States to ensure the alignment between the data access rules they adopt in transposition of the Recast Electricity Directive and the GDPR.



The parallel application of the rules introduced by the Recast Electricity Directive and the rules of the GDPR in the context of access to consumer data entails an entwinement of the roles, rights and obligations arising from both legal regimes. For example, electricity consumers whose data are accessed are also data subjects, and as such, are entitled to the protection and rights arising from both the Recast Electricity Directive and the GDPR. The managers of electricity data might qualify as data controllers or processors under the GDPR, depending on the legal and factual context in which they operate,[60] which is given by the data management model adopted by each Member State.[61] Eligible parties (including also 'third parties'[62]) who want to access consumer data can qualify as recipients[63] when they receive the data from the data manager, and become data controllers in respect of the processing carried out for their own purposes after they receive the data from the data manager. Hence, data managers giving access to consumer data and eligible parties obtaining access to these data will have to follow the obligations and requirements arising from both the Recast Electricity Directive and the GDPR.[64]

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[59] In practice, the added value of this reference is limited. Even without the clarification in the Directive, any processing of personal data falls under the scope of the GDPR, as defined by the Regulation itself.

[60] For an analysis of the factors that determine the roles of controller and processor, see European Data Protection Board, 'Guidelines 07/2020 on the Concepts of Controller and Processor in the GDPR' (EDPB 2021) Version 2.0 <https://edpb.europa.eu/system/files/2021-07/eppb_guidelines_202007_controllerprocessor_final_en.pdf> accessed 11 May 2022.

[61] In this regard, see Huhta (n 12) 15–16.

[62] The providers of services based on energy data are usually considered 'third parties' because they are not part of the traditional relationship behind the supply of energy (consumer-supplier-DSO).

[63] Art. 4 (9) GDPR: "'recipient' means a natural or legal person, public authority, agency or another body, to which the personal data are disclosed […]."

[64] For an overview of the different roles, rights and obligations stemming from the Recast Electricity

As noted by Lavrijssen, Espinosa Apráez and ten Caten (2022), the interplay of the provisions on access to consumer data in the Recast Electricity Directive and the rules for the processing of personal data in the GDPR also leads to interactions and possible overlaps between the competences of the supervisory authorities of each regime.[65] The Recast Electricity Directive (as well as the preceding legislation) requires Member States to appoint an independent national regulatory authority (known as 'NRA') tasked with the monitoring and enforcement of the legal regime applicable to the electricity sector, as well as with the adoption or implementation of certain regulations.[66] Specifically concerning the topic of this chapter, NRAs are responsible for "ensuring non-discriminatory access to customer consumption data",[67] which means that NRAs are competent to oversee how data managers provide access to consumer data to eligible parties.

On the other hand, the GDPR requires Member States to appoint an independent supervisory authority known as the 'data protection authority' (DPA), responsible for monitoring and contributing to the consistent application of the GDPR.[68] To be able to fulfil their duties, DPAs are given investigative, corrective and authorization and advisory powers.[69] Since access to data of consumers who are natural persons constitutes processing of personal data, the data managers and the eligible parties obtaining access to these data fall under the supervision of the national DPAs.

The two aspects here mentioned, on the one hand, the entwinement of the roles, rights and obligations arising from both legal regimes, and on the other hand, interactions and possible overlaps between the competences of the two supervisory authorities play an important role in the Personalized Offer case, as will be shown in the next section.

Directive and the GDPR, see Lavrijssen, Espinosa Apráez and ten Caten (n 11).

[65] Lavrijssen, Espinosa Apráez and ten Caten (n 11).

[66] See Chapter VII of the Recast Electricity Directive.

[67] As well as "the provision, for optional use, of an easily understandable harmonised format at national level for consumption data, and prompt access for all customers to such data pursuant to Articles 23 and 24 [of the Recast Electricity Directive]." Article 59, par. 1 (t), Recast Electricity Directive.

[68] Chapter VI of the GDPR.

[69] Article 58, GDPR.

## 4.3. The Personalized Offer case

This section will introduce the facts of the 'Personalized Offer case', a case taken from the Dutch electricity sector which shows the complexities of data sharing at the intersection between the GDPR and sectoral rules for access to consumer data in the electricity sector. The case is constructed around a ruling of the Dutch Trade and Industry Appeals Tribunal (hereinafter 'CBb').[70] The events on which this case is based took place between July 2017 and January 2020. The facts here presented are extracted from publicly available documents, including the ruling of the CBb, Dutch legal sources and documents published by the actors involved in the facts of the case. The legal context here described is given by the laws and regulations in force at the time of the events of the case and, where relevant, at the time of writing of this chapter.[71]



### 4.3.1 Background of the case

In the Netherlands, the management of consumer data is largely the responsibility of the DSOs, who, at the time of the events of the case, had jointly delegated their data management tasks to *Energie Data Services Nederland* (EDSN). In the Netherlands, following the Electricity Act 1998,[72] DSOs are legally responsible for installing, operating and collecting the data from smart meters and are obliged to share smart meter data with suppliers for the purposes of billing, changes of residence and switching of supplier.[73] In addition, DSOs must give access to smart meter data to third parties (e.g., providers of energy services) if the consumer gives consent to do so, following the rules of the GDPR.[74] This is explicitly regulated in the Dutch Electricity Act.

Besides smart meter data, DSOs manage other central data registers that are crucial for the functioning of the electricity market, including the **'Connection**

[70] CBb 14 January (2020) cases 18/2783 and 18/2846, NJB 2020/245, ECLI:NL:CBB:2020:3.

[71] Legal developments followed up to May 2022. Please note that new legislation is underway, and it is expected that important changes regarding data management and data exchange will be introduced. See the latest version of the Bill for an Energy Act (in Dutch: *Wetsvoorstel Energiewet*) published in November 2021 Ministerie van Economische Zaken en Klimaat, 'Wetsvoorstel Energiewet (UHT)' (*Rijksoverheid.nl*, 26 November 2021) <https://www.rijksoverheid.nl/documenten/publicaties/2021/11/26/wetsvoorstel-energiewet-uht> accessed 11 May 2022.

[72] Wet van 2 juli 1998, houdende regels met betrekking tot de productie, het transport en de levering van elektriciteit (Elektriciteitswet 1998), hereinafter 'Electricity Act 1998'. Available online at https://wetten.overheid.nl/BWBR0009755/2021-07-01 (accessed 11 May 2022).

[73] Electricity Act 1998, Art. 26ab, par. 1 and 2.

[74] Electricity Act 1998, Art. 26ab, par. 4.

**register'** (*aansluitingenregister* -**"C-AR**") and the **'End of contract register'** (*contracteindegegevensregister* - **"CER"**). The management of these data registers is not specifically regulated in the Dutch Electricity Act, but in the Information Code Electricity and Gas (ICEG).[75] The ICEG is an administrative act, or 'generally binding regulation'[76] adopted by the Dutch NRA for the energy sector, the Authority for Consumers and Markets (ACM)[77], on the basis of a proposal submitted by market parties engaged in the transport, supply or metering of electricity.[78] The Information Code lays down the conditions that apply to the exchange, recording, use and storage of data in the energy sector.[79]

The C-AR and CER were originally created as a 'single source of truth' to facilitate coordination between DSOs and suppliers in the context of the administrative processes that keep the retail electricity market running, e.g., invoicing, switching of supplier, moving in or out of a house.[80] The exchange of data for these processes is part of the regulatory obligations of DSOs and suppliers. Next to this regulated use of data, a new use for data from the C-AR and CER registers was found: the data could also be retrieved by potential new suppliers to prepare personalized offers for consumers, provided that they had received consent from the consumers to do so.

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[75] Besluit van de Autoriteit Consument en Markt van 21 april 2016, met kenmerk ACM/DC/2016/202148, houdende de vaststelling van de voorwaarden als bedoeld in artikel 54, eerste lid, van de Elektriciteitswet 1998 en artikel 22, eerste lid, van de Gaswet (Informatiecode elektriciteit en gas), available online at https://wetten.overheid.nl/BWBR0037934/2022-05-18 (accessed 27 May 2022).

[76] In Dutch: 'algemeen verbindend voorschrift'.

[77] The ACM is the regulatory authority for the energy sector, but it also has competences in other economic sectors (telecommunications, transport, postal services and healthcare), as well as two other regulatory domains: competition law and consumer protection law. For an overview of the competences of the ACM, see Authority for Consumers & Markets, 'Our Duties' (*ACM.nl*, n.d.) <https://www.acm.nl/en/about-acm/mission-vision-strategy/our-tasks> accessed 11 May 2022.

[78] Pursuant to Articles 53 and 54 of the Electricity Act 1998. At the time of the events of the case, it was the *Vereniging Nederlandse Energie Data Uitwisseling* (NEDU), an association of companies representing the different market roles of the energy sector in the Netherlands, who prepares the proposals to amend the Information Code.

[79] Note that it is likely that under the future Dutch Energy Act the data management rules will be laid down in the Act itself and/or in ministerial regulations. Hence, the role of the Information Code might significantly change once the new legislation is adopted in the Netherlands. See the Bill for an Energy Act in Ministerie van Economische Zaken en Klimaat (n 71).

[80] These registers were created as part of the implementation of the New Market Model (Nieuwmarkt Model) in the Netherlands in 2013. This model is a supplier-centric model, which entails that the main point of contact for the consumer is the energy supplier. Before the adoption of this model, both DSOs and suppliers were the point of contact for consumers for different parts of the administrative processes. For example, the consumers had to pay separate invoices to the DSO and the supplier for the grid costs and the supply costs respectively. Or, if mistakes were made in the context of a switch of supplier, there were three parties involved in correcting mistakes (the old supplier, the new supplier and the DSO). See 'Nieuw Marktmodel (NMM) voor de energiesector' (*DeEnergieGids.nl*, n.d.) <https://www.deenergiegids.nl/overstappen/nieuw-marktmodel-energiesector/> accessed 11 May 2022.

A personalized offer[81] entails that consumers who want a new energy contract can receive offers from energy suppliers, tailored to their actual needs and preferences.[82] In that sense, personalized offers facilitate that consumers can make more informed choices, allowing consumers to compare offers from different suppliers and facilitating switching of supplier.

To prepare a personalized offer, the energy suppliers needed data of the consumer, including the regional location and capacity of the household connection, annual energy consumption, the end date of the current energy contract and the contractual notice period.[83] This information is in principle known to the consumers, and they can manually provide it to the suppliers, but suppliers could also retrieve it in an automated way from the C-AR and CER managed by the DSOs, with the consent of the consumers. The latter option was considered more convenient for consumers and suppliers.

Since the data needed to prepare the personalized offers are information relating to identifiable natural persons (the consumers), they qualify as personal data and must be processed in accordance with the GDPR. From the perspective of the GDPR, the DSOs were the controllers of the personal data stored in the C-AR and CER.[84] Once the data (in fact, a copy of the data) were transferred to the requesting supplier to prepare a personalized offer, this supplier became controller of the received data. [85]

The data exchange for the purposes of personalized offers was initially not regulated in the ICEG or any other national regulation, and it did not fall *per se* under the data exchanges necessary to comply with regulatory obligations of the DSOs or the suppliers. However, after a huge data theft incident involving C-AR and CER data of two million Dutch households in 2016,[86] the market parties of the energy sector and

[81] In Dutch: '*aanbod op maat*'.

[82] See in this regard the document published by ACM, Authority for Consumers & Markets, 'Provision of Information in the Consumer Energy Market' (2016) <https://www.acm.nl/en/publications/publication/15991/Provision-of-information-in-the-consumer-energy-market> section 3.3.3.

[83] See the explanatory note number 44 of the Besluit van de Autoriteit Consument en Markt van 16 oktober 2018, kenmerk ACM/UIT/498344 tot wijziging van de voorwaarden als bedoeld in de artikelen 31 en 54, eerste lid van de Elektriciteitswet 1998 en de artikelen 12b en 22 van de Gaswet betreffende het verbeteren van de beveiliging van data (codebesluit dataveiligheid), hereinafter 'the Decision', available online at https://zoek.officielebekendmakingen.nl/stcrt-2018-60760.html, accessed 11 May 2022.

[84] See the explanatory note number 45 of the Decision.

[85] See the proposal to change the Information Code submitted by NEDU (and Netbeheer Nederland) before ACM, on 29 May 2017, NEDU and Netbeheer Nederland, 'Codewijzigingsvoorstel Dataveiligheid' (2017) 1 <https://www.acm.nl/sites/default/files/old_publication/publicaties/17449_codewijzigingsvoorstel-dataveiligheid-2017-06-08.pdf> accessed 11 May 2022.

[86] See Netbeheer Nederland, 'Uit Net NL: Sector Stelt Data En Marktwerking Veilig' (*Netbeheer Nederland*,

the ACM deemed necessary to lay down formal rules to regulate this data exchange in the ICEG. Following a proposal submitted by representatives of the market parties, in October 2018 the ACM adopted an administrative decision to amend the ICEG (hereinafter, 'the Decision')[87] aimed at "improving the security of (personal) data that are registered and exchanged for small-scale consumption connections".[88] This Decision introduced several articles into the ICEG, including two articles requiring DSOs to share consumer data from the C-AR and CER with the suppliers, for the purpose of preparing personalized offers, provided that the consumer had given his/her consent.[89]

In January 2020, the Dutch DSOs (through their branch association Netbeheer Nederland) announced that they would stop giving suppliers access to consumer data for the purposes of making personalized offers.[90] This announcement was motivated by a court ruling issued by the CBb on 14 January 2020. The ruling annulled the Articles of the ICEG that obliged DSOs to share data from the C-AR and CER with suppliers for the preparation of personalized offers. In lack of a clear legal basis to share (personal) data from the central registers with the suppliers, DSOs decided to stop giving access to these data.[91] In practice, this meant that in order to prepare personalized offers, suppliers could no longer retrieve data from the central registers and had to rely solely on the information manually provided by the consumers themselves. This made the preparation of the personalized offers more cumbersome for both consumers and suppliers and created the risk of penalties for anticipated contract termination if the information provided by the consumers was not accurate.[92]

The next paragraphs will elaborate on the argumentation behind the CBb ruling and the circumstances that lead to this court decision, which provide rich insights into the challenges of aligning the GDPR with the sectoral rules for access to consumer

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5 October 2017) <https://www.netbeheernederland.nlnieuws/uit-net-nl-sector-stelt-data-en-markt-werking-veilig-1196> accessed 11 May 2022.

87 Besluit van de Autoriteit Consument en Markt van 16 oktober 2018, kenmerk ACM/UIT/498344 tot wijziging van de voorwaarden als bedoeld in de artikelen 31 en 54, eerste lid van de Elektriciteitswet 1998 en de artikelen 12b en 22 van de Gaswet betreffende het verbeteren van de beveiliging van data (codebesluit dataveiligheid), ('the Decision') available online at https://zoek.officielebekendmakingen.nl/stcrt-2018-60760.html, accessed 11 May 2022.

88 Explanatory note number 24 of the Decision.

89 Articles 2.2.b4 and 2.5a.4.

90 See the press release published by Netbeheer Nederland, 'Geen Klantgegevens Meer Centraal Beschikbaar Voor Aanbod Op Maat' (*Netbeheer Nederland*, 27 January 2020) <https://www.netbeheernederland.nlnieuws/geen-klantgegevens-meer-centraal-beschikbaar-voor-aanbod-op-maat--1333> accessed 11 May 2022.

91 Netbeheer Nederland, 'Geen Klantgegevens Meer Centraal Beschikbaar Voor Aanbod Op Maat' (n 90).

92 See e.g., Pricewise, 'Wat Is Het Contract Einde Register (CER)?' (*Pricewise.nl*, n.d.) <https://www.pricewise.nl/energie-vergelijken/cer/> accessed 11 May 2022.

data. From a data protection perspective, the CBb ruling deals with one of the core principles laid down in the GDPR, the one requiring that personal data are processed "lawfully, fairly and in a transparent manner".[93] In particular, the ruling concerns the *lawfulness* of personal data processing, which is addressed more specifically in Article 6 of the GDPR. Paragraph 1 of this Article states that the processing of personal data is lawful only if at least one of six grounds applies. Such grounds are specified in literals (a) to (f) of the said provision and include the consent of the data subject,[94] as well as necessity of the processing in specific situations.[95] The CBbruling focuses on the ground of necessity to comply with a legal obligation to which the data controller is subject (Article 6, par. 1, (c)).



### 4.3.5 Origins of the legal controversy and the CBb ruling.

Following the abovementioned data theft incident, in May 2017, representatives of the Dutch energy sector submitted a proposal to amend the ICEG and introduce provisions clarifying the responsibilities of market parties and strengthening checks regarding the processing of personal data in the context of data exchanges. [96]

*The advice from the Dutch DPA*

Since the amendments to the ICEG entailed the processing of personal data, the ACM requested the advice of the Dutch DPA, the *Autoriteit Persoonsgegevens* (hereinafter, 'AP') as part of the rule-making process.[97] One of the main points raised by the AP in its advice, was that the proposed amendments to the ICEG intended to create a ground for the processing of personal data, specifically, a legal obligation[98] for DSOs to share consumers' personal data with energy suppliers. In the view of the AP, this was beyond the legal scope of the ICEG as defined by the Dutch Electricity Act, because the ICEG was intended to set *conditions* for data processing, which is fundamentally different from creating a *legal ground* for personal data processing.[99] Besides, the AP argued

[93] Principle of 'lawfulness, fairness and transparency', Article 5 (a), GDPR.

[94] Article 6, par. 1 (a), GDPR.

[95] Article 6, par. 1, GDPR, literals (b) to (f) stipulate that the processing of personal data is lawful when it is necessary for: (b) the performance of a contract or to take steps to enter into a contract; (c) compliance with a legal obligation to which the controller is subject; (d) protecting the vital interests of the data subject or another natural person; (e) the performance of a task carried out in the public interest or the exercise of official authority by the data controller; (f) legitimate interests pursued by the controller or a third party.

[96] See NEDU and Netbeheer Nederland (n 85).

[97] Request of advice from the ACM to the AP dated 4 July 2017, Authority for Consumers & Markets, 'Adviesaanvrag Codevoorstel Dataveiligheid' <https://www.acm.nl/nl/publicaties/adviesaanvraag-aan-de-autoriteit-persoonsgegevens> accessed 11 May 2022.

[98] Article 6, par. 1 (c) of the GDPR.

[99] Advice from the AP dated 23 October 2017, Autoriteit Persoonsgegevens, 'Advies van de Autoriteit Persoonsgegevens over Het Codevoorstel Dataveiligheid' 2 <https://www.acm.nl/nl/publicaties/advies-van-de-autoriteit-persoonsgegevens-over-het-codevoorstel-dataveiligheid> accessed 11 May 2022.

that it is not reasonable that the processing of personal data by the energy sector can be justified and legitimized in a Code prepared by the sector itself and adopted by the ACM. In the view of the AP, the *legal grounds* for data processing should be laid down in the Electricity Act or in an administrative act (order in council or ministerial regulation) based thereon.[100] Only the *conditions*, i.e., "the manner in which the data processing is practically applied" can be laid down in the ICEG.[101] In the view of the AP, introducing legal grounds to process personal data in the ICEG resulted in "an unbalanced and unclear regime with regard to the processing of personal data in the energy sector."[102] The AP thus recommended ACM to take a closer look at the issue of the grounds for processing of personal data in the ICEG, and advised against adopting the draft of the Decision that ACM sent for review.

*The Decision adopted by the ACM*

The ACM followed the advice from the AP only to a certain extent. The energy regulator adopted the Decision introducing the two articles that required DSOs to share consumer data from the C-AR and CER with the suppliers, for the purposes of making personalized offers. From the explanatory notes of the Decision, it seems that the DSOs (as data controllers) had intended to rely on the data sharing obligations to be introduced in the ICEG as the lawful ground to share C-AR and CER data in compliance with the GDPR.[103] However, citing the aforementioned advice of the AP as well as legislative explanatory memoranda concerning the scope of the ICEG,[104] the ACM specified that the ICEG did *not* provide a lawful basis to process consumers' personal data under Art. 6, par. 1 (c) of the GDPR (necessity to comply with a legal obligation).

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[100] To support this claim, the AP refers to the fact that the processing of smart meter data is regulated by law (in the Dutch Electricity Act) and not in the ICEG. Autoriteit Persoonsgegevens (n 99) 2–3.

[101] Autoriteit Persoonsgegevens (n 99) 3 (free translation).

[102] Autoriteit Persoonsgegevens (n 99) 2 (free translation).

[103] From the analysis of the documents on which this case is based, it can be concluded that for the ACM and the AP the consent granted by the consumers to the suppliers to retrieve their (personal) data for a personalized offer could not serve as a lawful basis for the DSOs to share these personal data with the suppliers. In other words, the retrieval of data by the suppliers and the transmission of data by the DSOs were seen as two separate data processing activities, each of which needed a separate ground for data processing. See in particular, Autoriteit Persoonsgegevens (n 99) and the explanatory notes of the Decision.

[104] Explanatory memoranda of legislative amendments to the Electricity Act 1998 concerning the ICEG. These documents stated that the ICEG does not provide a basis for the exchange of data (only a description of how data is exchanged (Tweede Kamer, Kamerstukken II, 2007-2008, 31374, nr. 3, p. 24), and that the ICEG itself is not intended to provide a generic legal basis for the exchange and processing of personal data (Tweede Kamer, Kamerstukken II, 2009-2010, 32374, nr. 3, p. 5). The latter explanatory memorandum also states that the ICEG regulates "'how' data is processed within the sector with a view to an unambiguously used model, and not 'that' data should be/may be processed.'" Free translation, emphasis added.

The ACM deviated from the AP's advice in one important point. Instead of further investigating what could be the appropriate ground for the processing of personal data in this case (because in its view, this was beyond its competences), the ACM stated that it was the responsibility of the DSOs to find the appropriate lawful basis to implement the data sharing obligations introduced in the ICEG by the Decision.[105]

*The position of the DSOs and other market parties*

NEDU and Netbeheer Nederland, acting as representatives of the energy market parties, expressed their disagreement with the approach of the ACM already during the procedure that preceded the adoption of the Decision,[106] and later when they submitted appeals against the Decision, requesting the annulment of the said Articles of the ICEG.



In the view of NEDU and Netbeheer Nederland, the ICEG could and should be considered an appropriate legal basis to introduce an obligation to share data with the suppliers for the purposes of the Personalized Offers. This was especially true, they argued, because DSOs in the Netherlands (due to strict unbundling requirements) are not allowed to engage in activities other than those entrusted to them by law.[107] In addition, it is relevant to note that Article 79 of the Dutch Electricity Act imposes upon DSOs an obligation to ensure that confidential information they hold is not made available to third parties, unless a statutory provision provides otherwise. [108] In this sense, the legal context of the Dutch electricity sector explains why DSOs wanted the ICEG to enshrine a legal obligation to provide data for the personalized offers in the first place.

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[105] See explanatory note number 50 of the Decision. The ACM also stated in the same explanatory note: "ACM will not further consider which other basis from the GDPR the network operators can use. It has not been found that network operators cannot rely on any other basis under Article 6, first paragraph of the GDPR. ACM therefore has no reason to assume that the code proposal is not feasible" (free translation).

[106] See the documents with the position of NEDU (dated 4 July 2018) and Netbeheer Nederland (dated 11 July 2018), NEDU, 'Zienswijze NEDU Op Ontwerp Codebesluit Dataveiligheid' <https://www.acm.nl/nl/publicaties/zienswijze-nedu-op-ontwerp-codebesluit-dataveiligheid> accessed 13 May 2022; Netbeheer Nederland, 'Zienswijze Netbeheer Nederland Op Ontwerp Codebesluit Dataveiligheid' <https://www.acm.nl/nl/publicaties/zienswijze-netbeheer-nederland-op-ontwerp-codebesluit-dataveiligheid> accessed 13 May 2022.

[107] See Netbeheer Nederland, 'Zienswijze Netbeheer Nederland Op Ontwerp Codebesluit Dataveiligheid' (n 106) 4. In this regard, Article 17 of the Electricity Act 1998 states: "A network operator does not perform any activities other than those necessary for the proper performance of the duties assigned to it by or pursuant to the law." Free translation.

[108] In this regard, see also Lexo Zardiashvili and Francien Dechesne, 'Consumer Control of Energy Data: The Need for the Consent Management Mechanism in the Energy Sector of the Netherlands and Roadblocks Related to Its Implementation' (Leiden University 2019) <https://scholarlypublications.universiteitleiden.nl/access/item%3A2983934/view> accessed 13 May 2022 section 'Data Confidentiality and access'.

Netbeheer Nederland also expressed that the Decision of the ACM left DSOs at a crossroad. DSOs would either have to comply with the ACM's Decision and share the data with the suppliers, even if they could not invoke another valid ground for personal data processing from the list in Article 6 of the GDPR, risking corrective measures from the AP (data protection authority); or they would have to refrain from sharing the data with the suppliers in order to avoid processing data without a basis in the GDPR, risking enforcement actions from the ACM (energy regulator).[109]

These and other arguments were the basis for the appeals submitted by NEDU and Netbeheer Nederland before the CBb.

*The ruling of the CBb*

The ruling deciding both appeals focuses mainly on one charge, namely, that ACM interpreted the GDPR incorrectly, by concluding in its Decision the ICEG does not form the basis for a legal obligation within the meaning of Article 6, par. 1 (c) of the GDPR.[110]

The CBb ruling starts by acknowledging that the ACM was right in asserting that the Electricity Act 1998 does not allow to introduce a legal obligation to process (in this case, give access to) personal data in the ICEG.[111] In the jargon of the GDPR, this means that, according to the CBb, the ICEG cannot be seen as the basis of a legal obligation to process personal data.[112] The CBb based this conclusion on the same parliamentary documents about the ICEG and the advice from the AP cited by the ACM in the explanatory notes of the appealed Decision above referred.

Nevertheless, the CBb decided to annul the articles of the Decision regulating the transmission of consumer data for the purposes of personalized offers (2.2b.4 and 2.5a.4). In the Tribunal's view, despite the explanatory statements, with the contested articles ACM *did impose* a legal obligation to process (in this case, to share) personal data upon the DSOs, in contravention of the Dutch Electricity Act 1998. That was the case, because ACM formulated the attacked articles in a mandatory and unconditional manner, obliging DSOs to provide data to the suppliers for the preparation of personalized offers, regardless of the existence of a ground for data processing following Art. 6 of the GDPR.[113] This was the reasoning of the CBb to annul the articles concerning the data exchange for the purposes of a customized offer in the ICEG.

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[109] Netbeheer Nederland, 'Zienswijze Netbeheer Nederland Op Ontwerp Codebesluit Dataveiligheid' (n 106) 3.

[110] CBb ruling [4.1.].

[111] CBb ruling [4.2.].

[112] Article 6, paragraph 3 of the GDPR stipulates that to invoke a legal obligation as the lawful ground for the processing of personal data, the basis for the processing shall be laid down by EU or Member State law.

[113] CBb ruling [4.3.].

*Consequences of the CBb ruling*

As already anticipated, the immediate consequence of the ruling was that DSOs decided to stop giving suppliers access to consumer data from the C-AR and the CER, making the preparation of personalized offers more cumbersome for suppliers and consumers. The impact of this ruling is considerable and goes beyond this specific case, casting doubts regarding the alignment between the GDPR and the current system of rules concerning data exchanges in the Dutch electricity sector, in particular concerning the grounds for legitimate personal data processing.[114] Although the CBb ruling only annulled two specific articles from the ICEG about one particular data exchange, its reasoning refers and can be applied to the ICEG as a whole, raising the crucial question of whether there are other exchanges of personal data in the Dutch electricity sector that have no other legal basis than the ICEG itself.



At the moment of writing, the Dutch Ministry of Economic and Climate Affairs (responsible for the energy sector) is preparing a bill for a new Energy Act.[115] It is expected that the new legislation (partly intended to transpose the Recast Electricity Directive) will include a re-design of the rules for data management and data exchange in the energy sector in the Netherlands.[116] Concerning the topic of this chapter, the latest bill includes provisions that aim at clarifying the obligations of DSOs concerning the sharing of data with eligible parties and thereby the lawful ground(s) for data processing for certain market processes. The first contours of the proposed legislation were published after the CBb ruling here analysed, in July 2020. Although not explicitly acknowledged, it seems plausible that the Personalized Offer case influenced the renewed attention given to data protection and the grounds for personal data processing in the bill.

The next section will zoom out from the specific facts of the Personalized Offer case and will draw lessons concerning the interplay between the Recast Electricity Directive and the GDPR. Suggestions to enhance the alignment between the two legal regimes here studied will be also presented in the next section.

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[114] See Netbeheer Nederland, 'Zienswijze Netbeheer Nederland Op Ontwerp Codebesluit Dataveiligheid' (n 106) 4.

[115] For the latest published version of the bill, see Ministerie van Economische Zaken en Klimaat (n 71).

[116] See Chapter 4 of the bill for an Energy Act, Ministerie van Economische Zaken en Klimaat (n 71).

## 4.4 Lessons from the Personalized Offer case

The case described above provides rich insights into how the two legal frameworks here analyzed interact in practice and allows to distil lessons that can guide Member States in ensuring consistent application of the two frameworks. The issues here identified are of relevance not only for the Netherlands, but also for other Member States. This is the case considering that all Member States must lay down rules for access to consumer data following the Recast Electricity Directive and ensure that access to consumer data takes place in compliance with EU personal data protection legislation. In addition, DSOs have a prominent role as data managers not only in the Netherlands, but also in many other Member States.[117]

With the entry into force of the Recast Electricity Directive, Member States should have started to introduce or update the legal framework for access to consumer data.[118] The upcoming adoption of the implementing acts concerning interoperability requirements and procedures for access to consumer data (pursuant to Article 24 of the said Directive mentioned above), might require that Member States introduce further adjustments or specifications to their national data access rules. This presents an opportunity to (re)examine how it will be ensured that access to consumer data can take place in compliance with the GDPR.

The next sections focus on two main lessons that arise from the 'Personalized Offer' case. On the one hand, the importance of ensuring substantive alignment between the rules for access to consumer data adopted by Member States and the GDPR. And on the other hand, the need to strengthen cooperation mechanisms between the supervisory authorities from each regime.

### 4.4.1 Enhancing substantive alignment between the data access rules adopted by Member States and the GDPR.

When regulating access to consumer data following the Recast Electricity Directive, Member States should take into account that the obligations and requirements arising from such rules cannot be seen in isolation from the obligations and requirements arising from the GDPR. As explained in Section 4.2. of this chapter, the managers of consumer data are also data controllers or processors in respect of personal data and are bound by the GDPR as much as they are bound by the data access rules.

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[117] As noted in section 4.2.1. of this chapter.

[118] The transposition deadline for the provisions concerning access to consumer data, in particular Articles 20, 23 and 24 of the Recast Electricity Directive was 31 December 2020 (See Article 71 of the said Directive).

Compliance with the GDPR is not and 'add-on' but a precondition to access consumer's personal data in the electricity sector. Member States should not disregard this when regulating access to consumer data following the Recast Electricity Directive. As observed in the Personalized Offer case with the decision of the DSOs to stop sharing data with the suppliers, legal uncertainty regarding whether data can be shared in compliance with the GDPR might end up hindering data sharing in the electricity market.

In the explanatory statements of ACM's Decision, the energy regulator asserted that the DSOs (as data controllers under the GDPR) were the ones responsible for finding the appropriate grounds for personal data processing to comply with the data sharing obligations introduced to the ICEG with the Decision. Moreover, the explanatory statements also stated that ACM was not obliged to test the feasibility of the amendments to the ICEG against the GDPR, only against the energy legislation. [119]



This contribution argues that data managers in their roles of data controllers or processors should not be the sole responsible to determine how consumer data will be exchanged in compliance with the GDPR. Leaving the issue at the entire discretion of the data managers might be problematic from the perspective of non-discriminatory access to consumer data. This is especially important in Member States in which data are managed by DSOs and (unlike in the Netherlands) the national unbundling requirements do not prevent them from being active in other segments of the market, for instance, as energy suppliers.[120] In such countries, if there is no clear guidance on how the requirements in the GDPR will be applied in the context of access to consumer data, there is a risk that DSOs (as data managers) will apply stricter data protection requirements when competitors request access to data.

Hence, there is a role to be played by Member States (legislators or competent authorities designated to regulate data sharing) to ensure that eligible parties can access consumer data under transparent and non-discriminatory conditions, as well as to ensure the right to the protection of personal data of consumers/data subjects.

Ensuring alignment between the two legal frameworks here analyzed requires more than just introducing an explicit reference to the applicability of the GDPR in the data access rules. The GDPR is a general legal framework with many open-ended provisions,

[119] See also explanatory note number 81 of the Decision.

[120] In this regard, the Impact Assessment published by the European Commission together with the proposal for a Recast Electricity Directive stated: "As most DSOs are also energy suppliers, safeguards are necessary to prevent them using privileged access to consumer data – especially smart metering data – to gain a competitive advantage in their supply operations." European Commission, 'Impact Assessment Recast Electricity Directive SWD (2016) 410 Final' (n 21) 76 (Part 1/5).

intended to be applied in a broad range of sectors where personal data are processed. Consequently, the provisions in the GDPR are per se not tailored to the specific needs and dynamics of the electricity sector, e.g., in terms of types of data, the specific risks involved in the processing of such data, and the actors involved in the exchange of data. And vice versa, the sectoral legislation of the electricity market is not primarily designed for the protection of personal data. The exchanges of data in this sector encompass data that do and do not qualify as personal data and must serve policy objectives beyond the protection of personal data. Hence, the substantive alignment of these two legal frameworks cannot be taken for granted.

There are several ways in which Member States can contribute to the alignment between the GDPR and the rules for access to consumer data in the electricity sector. One of such ways concerns the possibility that Member States have of specifying the rules in the GDPR by adopting national legal provisions that set out "the circumstances for specific processing situations, including determining more precisely the conditions under which the processing of personal data is lawful".[121] In this regard, Member States could clarify, for example, whether certain data exchanges need to be legitimized by a legal obligation, and if there are cases in which the consent or a request from the consumer are a precondition for the data exchange.

An alternative or complementary approach could be that Member States require that data managers draw up codes of conduct, in which they specify the application of the GDPR in the context of access to consumer data. Article 40 of the GDPR provides that associations or other bodies representing categories of controllers or processors can prepare codes of conduct "intended to contribute to the proper application of this Regulation, taking account of the specific features of the various processing sectors."[122] As acknowledged by the European Data Protection Board, codes of conduct are instruments that contribute to legal certainty "by providing practical solutions to problems identified by particular sectors in relation to common processing activities."[123] Besides assisting data managers (in their roles of data controllers or processors) to comply and demonstrate compliance with the GDPR, drawing up codes of conduct where the data managers explain how they interpret and apply the requirements of the GDPR when providing access to consumer data can contribute to fulfil the transparency and non-discriminatory requirements laid down in Article 23 of the Recast Electricity Directive.

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[121] Recital 10, GDPR. This Recital also recognizes that "Member States have several sector-specific laws in areas that need more specific provisions." See also Article 6, paragraph 2 of the GDPR.

[122] Article 40, pars. 1 and 2, GDPR.

[123] European Data Protection Board, 'Guidelines 1/2019 on Codes of Conduct and Monitoring Bodies under Regulation 2016/679' (EDPB 2019) Version 2.0 9 <https://edpb.europa.eu/our-work-tools/our-documents/guidelines/guidelines-12019-codes-conduct-and-monitoring-bodies-0_en> accessed 13 May 2022.

### 4.4.2. The need to strengthen formal cooperation mechanisms between data protection authorities and energy regulators.

As anticipated in Part 4.2 of this chapter and illustrated by the Dutch case described in Part 4.3., the powers of the DPAs and the NRAs are likely to come in contact with each other, as both authorities are competent to oversee access to consumer data, from their respective regulatory fields. The fact that multiple supervisory authorities are competent to supervise the conduct of the same market actors is per se not a problem, because each authority pursues the objectives of its respective regulatory framework. However, cooperation[124] between the supervisory authorities is crucial to ensure consistent application of the two frameworks.



In the Dutch case, it was observed that each supervisory authority had a different approximation to the issue of legitimate grounds for data processing in the context of the amendments to the ICEG. The advice from the AP questioned the legitimacy of the system of rules in the electricity sector, arguing (among others) that the ICEG cannot be used to legitimize the processing of personal data because its provisions are adopted following proposals submitted by the same market actors that process personal data. In addition, the AP urged the ACM to not adopt the proposed text and consider further how the exchanges of personal data to be regulated in the ICEG would be legitimized, taking into consideration that the ground of legal obligation could not be invoked. The ACM took into account the advice of the AP only partially and adopted the Decision without examining further the issue of grounds for legitimate processing of personal data arguing that this should be taken care of by the DSOs, leading to the 'crossroad' situation described earlier in this contribution.

[124] The term 'cooperation' is used here in a broad sense, to refer to situations in which different supervisory authorities work together in various degrees of interaction. This term is used because it is employed in the same way in the two legal frameworks here analyzed, as will be mentioned below. However, note that Public Administration literature makes a distinction between 'cooperation', 'coordination' and 'collaboration'. For example, in McNamara (2012) these three notions are seen as a continuum. At one end of the spectrum there is 'cooperation', i.e., when agencies "[choose] to work together, within existing structures and policies, to serve individual interests. In the middle there is 'coordination', i.e., the "interaction between participants in which formal linkages are mobilized because some assistance from others is needed to achieve organizational goals". And at the other end of the continuum is 'collaboration', i.e., the "interaction between participants who work together to pursue complex goals based on shared interests and a collective responsibility for interconnected tasks which cannot be accomplished individually". Madeleine McNamara, 'Starting to Untangle the Web of Cooperation, Coordination, and Collaboration: A Framework for Public Managers' (2012) 35 International Journal of Public Administration 389, 391 <https://doi.org/10.1080/01900692.2012.655527> accessed 13 May 2022.

DPAs and NRAs are experts in their respective field, and it is understandable that they do not have sufficient expertise in the working of each other's field. Since access to consumer data is a topic where data protection legislation and electricity market legislation intersect, it is important for the consistent application of these two frameworks that DPAs and NRAs can properly cooperate, to complement each other's expertise and, where appropriate, take joint enforcement actions.

As noted by Lavrijssen, Espinosa Apraez and Ten Caten (2022) neither the GDPR or the Recast Electricity Directive provide clear cooperation mechanisms between the DPAs and NRAs.[125] The Recast Electricity Directive mostly focuses on cooperation between NRAs from different Member States, the European Commission and the Agency for the Cooperation of Energy Regulators (ACER).[126] Regarding cooperation between NRAs and other national authorities, the Directive merely mentions that the NRAs should exercise their powers in close cooperation with other national authorities, mainly competition authorities and consumer protection authorities.[127] In the GDPR there are mechanisms to enable cooperation between DPAs of different Member States,[128] but nothing is said about cooperation between DPAs and other supervisory authorities such as NRAs. Against this background, there is a role to be played by Member States in ensuring that national legal frameworks facilitate that these authorities can cooperate.

The overlap of competences between different supervisory authorities is not a new issue and surely not one exclusively happening in the electricity sector. The convergence of different regulatory domains that is taking place in the context of digital markets (in particular concerning competition, consumer protection and personal data protection law) is also illustrative of this phenomenon.[129] This has led

[125] Lavrijssen, Espinosa Apráez and ten Caten (n 11).

[126] See e.g., Article 58 (a) and Article 59, par.1 (f) of the Recast Electricity Directive

[127] See e.g., Article 58 (g) and Article 59, par. 2 and 3 (b).

[128] See Chapter VII of the GDPR.

[129] Arnbak, Geursen and Yakovleva (2020) use the expression "kaleidoscopic enforcement" to refer to "situations where several competent authorities can, independently, carry out enforcement actions against the same practice, or where an authority competent to carry out enforcement in one area of law can borrow the concepts of another area to advance its own goals". Svetlana Yakovleva, Wessel Geursen and Axel Arnbak, 'Kaleidoscopic Data-Related Enforcement in the Digital Age' (2020) 57 Common Market Law Review 1461, 1461 <http://www.kluwerlawonline.com/api/Product/CitationPDFURL?file=Journals\COLA\COLA2020744.pdf> accessed 13 May 2022. On the convergence of different regulatory domains in the context of digital markets see among others Natali Helberger, Frederik Zuiderveen Borgesius and Agustin Reyna, 'The Perfect Match? A Closer Look at the Relationship between Eu Consumer Law and Data Protection Law' [2017] Common Market Law Review 1427 <http://www.kluwerlawonline.com/api/Product/CitationPDFURL?file=Journals\COLA\COLA2017118.pdf>; Inge Graef and Sean van Berlo, 'Towards Smarter Regulation in the Areas of Competition, Data Protection and Consumer Law: Why Greater Power Should Come with Greater Responsibility' (2021) 12 European Journal of Risk Regulation 674 <https://www.

to initiatives to enhance cooperation between the supervisory authorities from each domain, both at EU and Member State level. These initiatives can serve as a reference to develop cooperation mechanisms between DPAs and NRAs.

At EU level, one example of such initiatives is the "Digital Clearing House", a platform bringing together regulatory authorities, policymakers and other stakeholders, aimed at achieving "better and more coherent protection of individuals in an era of big data and artificial intelligence".[130] The Digital Clearing House is a voluntary network of regulatory authorities from the competition, data protection and consumer protection domains, that emerged following a recommendation from the European Data Protection Supervisor (EDPS) in 2016.[131]



At Member State level, an interesting example is found in the Netherlands. In October 2021, the Dutch DPA (AP), the ACM (as Authority for Consumers and Markets), the Authority for the Financial Markets and the Dutch Media Authority launched the "Digital Regulation Cooperation Platform".[132]

The cooperation between the different authorities is aimed at strengthening oversight in the digital and online environment, by means of exchanging knowledge and experiences, making joint investments in expertise and skills, and exploring avenues to cooperate in enforcement procedures (e.g., taking joint action).[133] A similar initiative exists in the former EU Member State, the United Kingdom, where

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cambridge.org/core/journals/european-journal-of-risk-regulation/article/towards-smarter-regulation-in-the-areas-of-competition-data-protection-and-consumer-law-why-greater-power-should-come-with-greater-responsibility/8B00EFC66EA7F599DB9B700B1720ABAD> accessed 13 May 2022.

[130] 'Digital Clearinghouse' (*Digital Clearinghouse*, n.d.) <https://www.digitalclearinghouse.org> accessed 13 May 2022.

[131] European Data Protection Supervisor, 'EDPS Opinion on Coherent Enforcement of Fundamental Rights in the Age of Big Data' (EDPS 2016) Opinion 8/2016 <https://edps.europa.eu/sites/edp/files/publication/16-09-23_bigdata_opinion_en.pdf> accessed 13 May 2022.

[132] In Dutch: *Samenwerkingsplatform Digitale Toezichthouders* (SDT). See Autoriteit Persoonsgegevens, 'Dutch Regulators Strengthen Oversight of Digital Activities by Intensifying Cooperation' (*Autoriteit Persoonsgegevens*, 13 October 2021) <https://autoriteitpersoonsgegevens.nl/en/news/dutch-regulators-strengthen-oversight-digital-activities-intensifying-cooperation> accessed 13 May 2022.

[133] For example, in early 2022, the members of the Digital Regulation Cooperation Platform announced that they will launch a study to investigate to which extent businesses, organizations and governments provide clear and sufficient information to internet users regarding how their data are used. The findings of the study will be used by the members of the Platform to jointly "draw up basic principles for effective, online transparency", and to signal to the Dutch legislator if the existing legal frameworks need to be adapted to prevent or counter harmful practices. Authority for Consumers & Markets, 'Dutch Regulators Press for Better Information about Online Use of Internet Users' Data' (*ACM*, 2 March 2022) <https://www.acm.nl/en/publications/dutch-regulators-press-better-information-about-online-use-internet-users-data> accessed 13 May 2022.

the Competition and Markets Authority, the communications regulator (OfCom) and the DPA (Information Commissioner's Office) launched a Digital Regulation Cooperation Forum.[134]

Another more formal alternative of cooperation is exemplified by bilateral cooperation protocols. In the Netherlands, for example, the DPA (AP) has entered into cooperation agreements with supervisory authorities from different regulatory fields which intersect with the protection of personal data, e.g., financial services, healthcare, competition law and consumer protection.[135] The cooperation protocols include, among others, provisions regarding periodic meetings between the supervisory authorities, the appointment of contact persons, the exchange of information and guidelines on how to proceed in cases of concurrent powers.[136]

These initiatives to further cooperation between different regulators involved in the supervision of digital markets might serve as a reference for Member States to devise legal mechanisms for cooperation between energy regulators and DPAs, or to include energy regulators in existing cooperation networks. National legislators can lay down the legal basis and general objectives of such cooperation, and the supervisory authorities can develop the specific arrangements to materialize it.

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[134] Competition and Markets Authority and others, 'The Digital Regulation Cooperation Forum' (GOV.UK, 10 March 2021) <https://www.gov.uk/government/collections/the-digital-regulation-cooperation-forum> accessed 11 May 2022.

[135] The legal basis for this is provided by the *Uitvoeringswet Algemene verordening gegevensbescherming (UAVG)* of 16 May 2018, the Act adopted to implement and specify certain aspects of the GDPR in the Netherlands. Article, 19 par. 1 of the UAVG authorizes the AP to establish cooperation protocols with other supervisory authorities "[I]n the interest of efficient and effective supervision of the processing of personal data" (free translation).

[136] See for example, the latest cooperation protocol between the AP and the ACM, for topics in which their powers converge, including competition law, consumer protection and sector specific market supervision, *Samenwerkingsprotocol tussen Autoriteit Consument en Markt en Autoriteit Persoonsgegevens,* dated 18 June 2020 (*Staatscourant* 2020, 36741), available online at https://zoek.officielebekendmakingen.nl/stcrt-2020-36741.html, accessed 13 May 2022. Interestingly, by the time of the events of the Personalized Offer case, there was also a Collaboration Protocol in force (*Samenwerkingsprotocol tussen Autoriteit Consument en Markt en Autoriteit Persoonsgegevens*, dated 11 October 2016 (*Staatscourant* 2016, 58078), available online at https://zoek.officielebekendmakingen.nl/stcrt-2016-58078.html, accessed 13 May 2022). However, this Protocol is not mentioned by the ACM in its Decision or in the request for advice to the AP. This might be related to the fact that the Protocol seems to be mostly intended to cover cooperation in enforcement actions, and in the Personalized Offer case, the issue at hand was not an enforcement action but the adoption of data access rules for the electricity sector.

## 4.5. Conclusions

The growing interest in consumer data in the context of the EU data economy and the energy transition has led to the inclusion of provisions in the Recast Electricity Directive requiring Member States to lay down clear rules for access to such data. Consumer data can also qualify as personal data, thereby triggering the application of the GDPR next to the data access rules.



Although the Recast Electricity Directive explicitly acknowledges that the exchange of consumers' personal data should be done in accordance with the GDPR, it offers little guidance regarding how this can be achieved. Hence, there is a role to be played by Member States to organize and regulate efficient and non-discriminatory access to consumer data in a way that the protection of personal data is ensured.

This chapter analyzed a case from the Dutch electricity sector (the Personalized Offer case), which illustrated the challenges of applying simultaneously the GDPR and the sectoral rules for access to consumer data. The overall conclusion from this analysis is that Member States (in particular, legislators and national supervisory authorities) should take steps to avoid legal uncertainty and ensure the consistent application of both frameworks, making possible that consumer data can be accessed while safeguarding personal data protection.

Two main learnings from the case were discussed in Part 4. Firstly, the importance of ensuring substantive alignment between the rules for access to consumer data adopted by Member States and the GDPR. Secondly, the need to strengthen cooperation mechanisms between the supervisory authorities from each regime, namely, NRAs and DPAs. Since the Recast Electricity Directive does not deal with the issues here identified, Member States ought to be proactive when regulating access to consumer data and not limit themselves to make explicit reference to the applicability of the GDPR. Concrete suggestions of what could be done to strengthen substantive alignment between these two legal frameworks and to enhance cooperation between the concurrent supervisory authorities were also provided in Section 4.4.

*Limitations and suggestions for further research*

Even if the case is based on the specific regulatory context of the Netherlands at the time of the events, the issues here identified can also play a role (*mutatis mutandi)* in other Member States, taking into account that DSOs have an important involvement in data management in multiple countries, and the fact that all

Member States have to appoint DPAs and NRAs to ensure compliance with the GDPR and the legislation transposing the Recast Electricity Directive.

The research here presented focused on extracting learnings from the Dutch case concerning the two main issues already explained. Of course, this does not exclude that there might be other challenges arising from the interplay of the GDPR and EU electricity legislation.[137]

An interesting avenue for further research would be to examine to which extent Member States pay attention to the interplay between the two frameworks when transposing the Recast Electricity Directive, and whether measures are taken to ensure substantive legal alignment and cooperation between the supervisory authorities. A question that may follow up from such exploration (if it turns out that Member States follow divergent interpretations or approaches) is to which extent further harmonization of data protection in the electricity sector is necessary to ensure equivalent protection of personal data across the EU and/or to avoid obstructions to the internal market for electricity. A similar question was proposed already in 2012 by the European Data Protection Supervisor in its Opinion concerning the roll out of smart meters under the Third Energy Package and the Data Protection Directive (Directive 95/46/EC).[138] Observing how Member States deal with the challenges of applying the current data protection and electricity legislation can provide the input to answer this important question.

[137] For example, on the questions arising from applying simultaneously the rules for personal data portability in the GDPR and the rules for access to smart meter data in the Recast Electricity Directive, see Graef, van den Boom and Husovec (n 13); Lavrijssen, Espinosa Apráez and ten Caten (n 11). See also the report on consumer control of energy (personal) data and the roadblocks for implementing consent management mechanisms in the Netherlands by Zardiashvili and Dechesne (n 108).

[138] European Data Protection Supervisor, 'Opinion of the European Data Protection Supervisor on the Commission Recommendation on Preparations for the Roll-out of Smart Metering Systems' (EDPS 2012) <https://edps.europa.eu/sites/edp/files/publication/12-06-08_smart_metering_en.pdf> accessed 13 May 2022 section 3.2.

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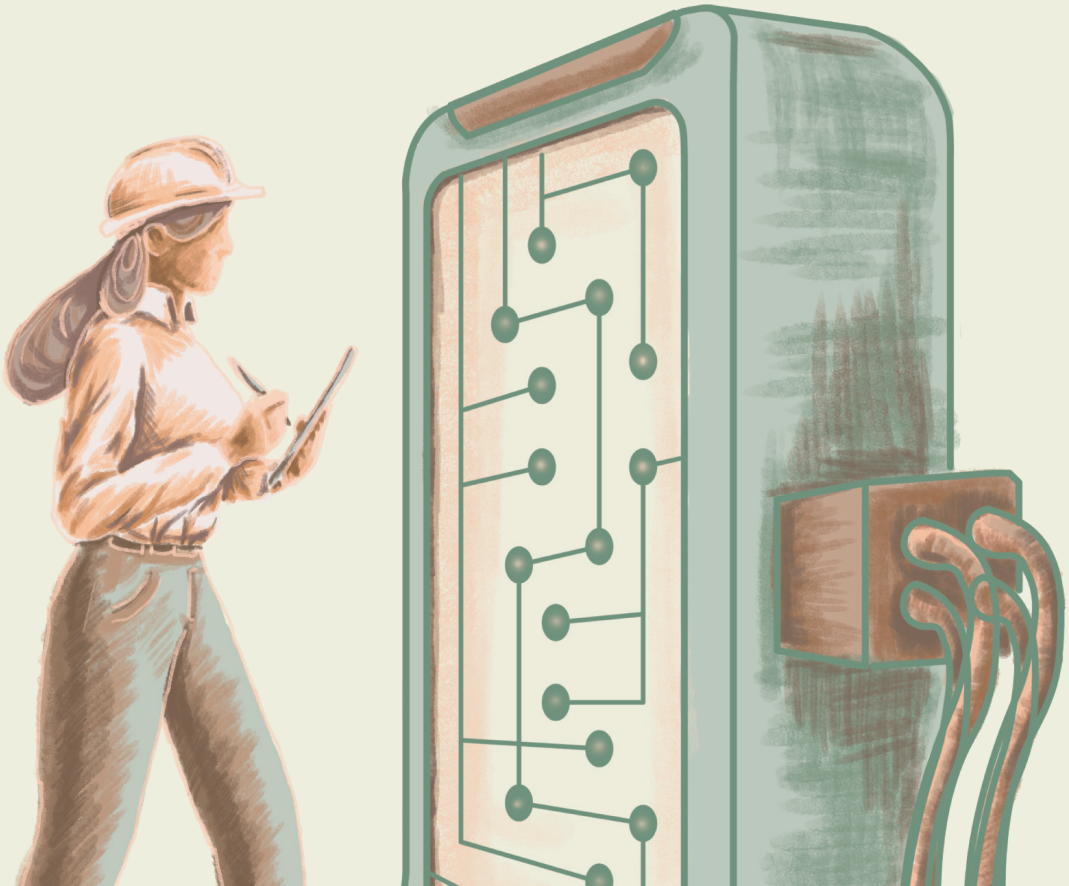

# CHAPTER 5

# Reconsidering the Public-Private Data Dichotomy in the European Union's Data Sharing Policies

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## 5.1. Introduction

Since 2014, the European Commission has as a central part of its policies the promotion and facilitation of a thriving data-economy[1] and the creation of a single European data space, i.e., a single market for data.[2] A crucial aspect of such an economy is having sufficient data available to reap the benefits of data-driven innovation.[3]

In its 2020 Communication 'A European strategy for data', the European Commission highlighted that '[c]urrently there is not enough data available for innovative re-use, including for the development of artificial intelligence.'[4] As a result, the full potential of the data economy in the European Union (hereinafter 'EU') cannot be realized. For that reason, putting forward policies and legislation that facilitate and promote data sharing is high in the European Commission's agenda.

Data sharing is understood in this contribution as the action of making data held by an organization (the data holder) available for re-use by other parties outside that organization (data re-users); where re-use can be understood as the use of data for commercial or non-commercial purposes other than the initial purpose for which data were produced. This notion covers both voluntary data sharing and the sharing of data following a legal obligation.[5]

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1 European Commission, 'Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions "Towards a Thriving Data-Driven Economy"' (European Commission 2014) COM/2014/0442 final.

2 European Commission, 'Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions "A European Strategy for Data"' (European Commission 2020) COM/2020/66 final <https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX%3A52020DC0066>.

3 In a report published by the OECD in 2015, the term 'data-driven innovation' is defined as '[t]he use of data and analytics to improve or foster new products, processes, organisational methods and markets'. OECD, 'Data-Driven Innovation: Big Data for Growth and Well-Being', OECD, 'Data-Driven Innovation: Big Data for Growth and Well-Being' (OECD Publishing 2015) 17 <https://doi.org/10.1787/9789264229358-en>.

4 European Commission, 'A European Strategy for Data, COM/2020/66 Final' (n 2) 6.

5 This broad working definition draws from the Directive (EU) 2019/1024 on open data and the re-use of public sector information (hereinafter 'Open Data Directive'), in particular the definition of 're-use' in Art. 2(11); European Commission, 'Commission Staff Working Document "Guidance on Sharing Private Sector Data in the European Data Economy"' (2018) SWD(2018) 125 final <https://eur-lex.europa.eu/legal-content/EN/TXT/?qid=1539766272141&uri=CELEX%3A52018SC0125>; and the European Commission, 'Proposal for a Regulation of the European Parliament and of the Council on European Data Governance (Data Governance Act) COM/2020/767 Final' (2020) <https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX%3A52020PC0767>. It is worth noting that the proposed Data Governance Act defines data sharing in a slightly narrower manner, as 'the provision by a data holder of data to a data user for the purpose of joint or individual use of the shared data, based *on voluntary agreements*, directly or through an intermediary' (emphasis added). Thus, this definition of data sharing would cover only the sharing of data on a voluntary basis. Given the relatively limited scope of application the proposed Data Governance Act (discussed in Section 4.1.1. below), and considering that other EU legislation and policy, as well as legal

When articulating its data sharing policies, the European Commission resorts to certain differentiations or dichotomies that are supposed to help in identifying what legal and policy frameworks are applicable and should be observed in each case. The most notable dichotomies are, on the one hand, the distinction between personal data and non-personal data, and, on the other hand, the distinction between public and private sector data.[6] Although such dichotomies might seem useful to give structure to policy and academic discussions, this binary approach does not always reflect the current dynamics of data production and can lead to counterproductive outcomes.

There is already literature that discusses the inadequacies of the personal vs. non-personal data dichotomy present in EU data (sharing) legislation and policies, and the need to move towards a more holistic regulatory approach.[7] In contrast, studies that scrutinise the public- private data dichotomy that shapes EU data sharing legislation and policy are largely absent in legal scholarship.



scholarship, usually refer to data sharing as encompassing voluntary and mandated data exchanges, the broader definition outlined above will be followed.

[6] See European Commission, 'Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions "Towards a Common European Data Space"' (2018) COM(2018) 232 final <https://eur-lex.europa.eu/legal-content/en/TXT/?uri=CELEX%3A52018DC0232>; European Commission, 'A European Strategy for Data, COM/2020/66 Final' (n 2).

[7] See Inge Graef, Raphaël Gellert and Martin Husovec, 'Towards a Holistic Regulatory Approach for the European Data Economy: Why the Illusive Notion of Non-Personal Data Is Counterproductive to Data Innovation' (2019) 44 European Law Review 605 <https://www.westlaw.com/Document/IC048A060F4D411E9AC57CCBC247CA5E8/View/FullText.html?transitionType=Default&contextData=(sc.Default)&VR=3.0&RS=cblt1.0>; Inge Graef, 'Paving the Way Forward for Data Governance: A Story of Checks and Balances': [2020] Technology and Regulation 24 <https://techreg.org/index.php/techreg/article/view/57>; Josef Drexl, 'Legal Challenges of the Changing Role of Personal and Non-Personal Data in the Data Economy (Drexl)' in Alberto Franceschi and others (eds), *Digital Revolution - New Challenges for Law: Data Protection, Artificial Intelligence, Smart Products, Blockchain Technology and Virtual Currencies* (Beck CH 2020).

This chapter contributes to filling that gap, by investigating the assumptions underlying the public-private sector data dichotomy in EU law and policy and discussing whether this binary approach to regulating data sharing can be sustained under the current dynamics of data production. The research aims to contribute to the booming legal research on data governance, wherein the regulation of data access and re-use occupy a prominent place.[8]

This study employs a doctrinal research methodology, and it starts by examining EU law and policy applicable to data sharing, in order to identify which criteria are used to define when data are considered from the public or the private sector, and the regulatory approach employed for each sector. This analysis is presented in section 5.2. of this chapter. In respect of public sector data, this chapter examines EU legislation that addresses the availability and re-use of data held by the public sector.[9] Specifically, this research focuses on the 'Open Data Directive' and, where relevant, the legislation that preceded it. Concerning private sector data, this study examined communications and staff working documents published by the European Commission, which summarize its vision and approach for the sharing of privately held data.[10] Section 5.3. identifies the shortcomings of the public-private data

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[8] See e.g., the special issue on 'Governing Data as a Resource' published by the journal Technology and Regulation in 2020, in particular: Charlotte Ducuing, 'Beyond the Data Flow Paradigm': [2020] Technology and Regulation 57 <https://techreg.org/index.php/techreg/article/view/49>; Graef (n 7); Michael Madison, 'Tools for Data Governance' [2020] Technology and Regulation 29 <https://techreg.org/index.php/techreg/article/view/45>; Teresa Scassa, 'Designing Data Governance for Data Sharing': [2020] Technology and Regulation <https://techreg.org/index.php/techreg/article/view/51>. See also: Heiko Richter and Peter R Slowinski, 'The Data Sharing Economy: On the Emergence of New Intermediaries' (2019) 50 IIC- International Review of Intellectual Property and Competition Law 4 <http://link.springer.com/10.1007/s40319-018-00777-7> accessed 7 May 2019; Richard Feasey and Alexandre de Streel, 'Data Sharing for Digital Markets Contestability: Towards a Governance Framework' (CERRE 2020) <https://cerre.eu/publications/data-sharing-digital-markets-competition-governance/> accessed 11 May 2022; Laura Zoboli, 'Fueling the European Digital Economy: A Regulatory Assessment of B2B Data Sharing' (2020) 31 European Business Law Review <https://kluwerlawonline.com/journalarticle/European+Business+Law+Review/31.4/EULR2020026>.

[9] This chapter does not cover the legal and policy frameworks concerning the regimes of access to public sector information, which is largely a matter of the exclusive competence of Member States. Although intertwined, the legal regimes of access to and re-use of public sector information have a different scope. While the access regimes are grounded in the democratic need to know the content of public sector information, the re-use regimes go beyond that and emphasize the possibility of using information for other commercial or non-commercial purposes. In this regard, see e.g., Mireille van Eechoud, 'Making Access to Government Data Work' (2015) 9 Masaryk University Journal of Law and Technology 61 <https://journals.muni.cz/mujlt/article/view/3717> accessed 25 May 2020; Katleen Janssen, 'The EC Legal Framework for the Availability of Public Sector Spatial Data: An Examination of the Criteria for Applying the Directive on Access to Environmental Information, the PSI Directive and the INSPIRE Directive.' (2009) <https://lirias.kuleuven.be/retrieve/94728> accessed 6 August 2019.

[10] This contribution does not include a detailed analysis of EU legislation governing the access to privately data in specific economic sectors. See section 5.2.2. for references to sectoral data sharing regimes and

dichotomy observed in current in EU data sharing legislation and policy. Section 5.4. explores whether the identified shortcomings will be addressed by the regulatory intervention announced by the European Commission in its Data Strategy. It provides starting points for further exploration toward a more consistent regulatory approach to data sharing. The conclusions of this research are presented in section 5.5. Section 5.6. provides an update concerning legal developments after the publication of the paper on which this chapter is based.

## 5.2. The public-private dichotomy in EU data sharing law and policy



It is said that data have no intrinsic value *per se*, and that their value lies on their use and re-use.[11] Data (and information in general) have three characteristics that make them especially suitable to be re-used: they are non-rivalrous, non-excludable (by default) and once they have been produced, the cost of reproduction tends to be zero.[12] These characteristics make possible that data can be shared and used 'by multiple users for multiple purposes as an input to produce an unlimited number of goods and services'[13], in both, the public and private sector. As summarized in a 2019 report from the OECD, some of the expected benefits of data sharing, are more transparency, accountability and user (and citizen) empowerment, new business opportunities and increased efficiency as a result of integration of data from different sources.[14]

Considering the expected economic and social gains derived from data sharing, it is seen by the European Commission as a key aspect of a thriving data economy.[15] However, it seems that data sharing in the EU has not reached yet an optimal level, and that there are issues of insufficient availability of data.[16] Against this backdrop, putting forward policies that stimulate and facilitate data sharing within and across

literature studying such regimes.

11 See European Commission, 'A European Strategy for Data, COM/2020/66 Final' (n 2) 6; OECD, 'Data-Driven Innovation' (n 3) 181.

12 Luciano Floridi, *Information: A Very Short Introduction* (Oxford University Press 2010) 30 <http://ebookcentral.proquest.com/lib/uvtilburg-ebooks/detail.action?docID=737413> accessed 3 February 2020; see also Rob Kitchin, 'Conceptualising Data', *The Data Revolution: Big Data, Open Data, Data Infrastructures & Their Consequences* (SAGE Publications Ltd 2014) 10 <http://methods.sagepub.com/book/the-data-revolution> accessed 12 April 2019.

13 OECD, 'Data-Driven Innovation' (n 3) 181.

14 OECD, *Enhancing Access to and Sharing of Data* (2019) 64 <https://www.oecd-ilibrary.org/content/publication/276aaca8-en>.

15 European Commission, 'Towards a Common European Data Space COM(2018) 232 Final' (n 6); European Commission, 'A European Strategy for Data, COM/2020/66 Final' (n 2).

16 European Commission, 'A European Strategy for Data, COM/2020/66 Final' (n 2) 6.

sectors has become one of the key lines of action of the European Commission in order to foster the data economy.

The European Commission has articulated the issues of availability of data in four fronts, corresponding to broad categorizations of data sharing based on who is the data holder and the data user:[17]

- Use of public sector information by businesses (government-to-business – G2B – data sharing).
- Sharing and use of privately-held data by other companies (business-to-business – B2B – data-sharing).
- Use of privately-held data by government authorities (business-to-government – B2G data sharing).
- Sharing of data between public authorities.

From these four data sharing categories, the first two address accessibility and re-use of data to foster innovation and economic growth. The other two refer to accessibility and re- use of data to improve policymaking and the execution of other public tasks.[18] For reasons of space and considering that the European Commission has so far devoted considerably more attention to the first two categories,[19] this chapter will focus on G2B and B2B data sharing. As will be explained in the following sections, the regulatory approach adopted at EU level for each of these two data sharing categories is significantly different.

### 5.2.1. Sharing of public sector data

In the EU, the sharing of public sector data for re-use by businesses (G2B) is mainly regulated by the Directive (EU) 2019/1024 on open data and the re-use of public sector information (the 'Open Data Directive').[20] The Open Data Directive is a recast of the Directive 2003/98/EC on the re-use of public sector information (hereafter, 'the PSI

[17] European Commission, 'A European Strategy for Data, COM/2020/66 Final' (n 2) 6–8.

[18] European Commission, 'A European Strategy for Data, COM/2020/66 Final' (n 2) 7–8.

[19] Although B2G data sharing is gradually getting higher in the Commission's agenda. See the report prepared by the High-Level Expert Group on Business-to-Government Data Sharing: European Union, 'Towards a European Strategy on Business-to-Government Data Sharing for the Public Interest' (2020) <https://ec.europa.eu/digital-single-market/en/news/experts-say-privately-held-data-available-european-union-should-be-used-better-and-more> accessed 24 July 2020; see also European Commission, 'A European Strategy for Data, COM/2020/66 Final' (n 2).

[20] Directive (EU) 2019/1024 of the European Parliament and of the Council of 20 June 2019 on open data and the re-use of public sector information (2019) OJ L 172, 83-23. It is worth noting that the Directive also applies to the sharing of public sector data with citizens. See in particular Art. 2(11), which defines 're-use' as the use by persons or legal entities of documents held by PSBs and public undertakings.

Directive'),[21] as revised by the Directive 2013/37/EU.[22] The Open Data Directive, as well as its predecessor, departs from the idea that the public sector collects or produces an array of valuable information in execution of its tasks, which can in turn be re-used by businesses and citizens to create innovative products and services.[23] To the extent that this legislation encourages the emergence of new markets based on information generated by the public sector, it can be seen as a manifestation of industrial policy in EU law.[24]

Since its origins with the 2003 Directive,[25] the EU legislation on the re- use of public sector information ('PSI') has been based on the proper functioning of the internal market enshrined in Art. 114 of the Treaty on the Functioning of the European Union.[26] Its main objectives are providing minimum harmonising rules that facilitate the creation of EU-wide information products and services based on PSI, and enhancing the cross-border use of PSI by private businesses to create added-value information products and services.[27]



The Directive currently in force enshrines a set of rules governing the re-use and the practical arrangements to facilitate the wide re-use[28] of three main types of PSI:

**a) Documents held by public sector bodies (hereafter, PSBs) – Art. 1, par. 1(a).**
PSBs are "the State, regional or local authorities, bodies governed by public law and associations formed by one or several such authorities or one or several such bodies

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21 Directive 2003/98/EC of the European Parliament and of the Council of 17 November 2003 on the re-use of public sector information (2003) OJ L 345, 90-96.

22 Directive 2013/37/EU of the European Parliament and of the Council of 26 June 2013 amending Directive 2003/98/EC on the re-use of public sector information (2013) OJ L 175, 1–8.

23 Recital 8 of the Open Data Directive.

24 Josef Drexl, 'The Competition Dimension of the European Regulation of Public Sector Information and the Concept of an Undertaking', *State-Initiated Restraints of Competition* (Edward Elgar Publishing 2015) 66.

25 For further reading on the origins and evolution of the PSI legislation in the EU, see e.g., Katleen Janssen and Jos Dumortier, 'Towards a European Framework for the Re-use of Public Sector Information: A Long and Winding Road' (2003) 11 International Journal of Law and Information Technology 184 <https://academic.oup.com/ijlit/article/11/2/184/854368> accessed 23 April 2020; Lorenzo Dalla Corte, 'Towards Open Data Across the Pond' in Bastiaan van Loenen, Glenn Vancauwenberghe and Joep Crompvoets (eds), *Open Data Exposed* (TMC Asser Press 2018) <https://doi.org/10.1007/978-94-6265-261-3_2> accessed 22 July 2020.

26 Consolidated version of the Treaty on the Functioning of the European Union 2016 OJ C202/1.

27 Open Data Directive, Recital 70.

28 'Re-use' is defined in the Open and PSI Directive as the use by persons of legal entities of documents held by PSBs or public undertakings, other than for the initial purpose for which they were produced, within a given public task (for the case of PSBs) or in the provision of services in the general interest (in the case of public undertakings). The exchange of documents between PSBs or between public undertakings and PSBs purely in pursuit of the public tasks of the latter, does not qualify as re-use (Art. 2(11) of the Open Data & PSI Directive).

governed by public law".[29] The Open Data Directive applies to existing documents (including data)[30] held by PSBs, excluding documents produced or obtained outside the scope of their public task, as defined by the law, other binding rules or, in their absence, by common administrative practice in the Member State in question.[31]

**b) Documents held by public undertakings active in the provision of utilities and transport services – Art. 1, par. 1(b).**

Public undertakings were excluded from the original scope of the PSI Directive (which covered only data held by PSBs),[32] but this changed with the Open Data Directive. 'Public undertaking' is defined in the new Directive as any undertaking active in specific utilities and transport sectors[33] over which PSBs "may exercise directly or indirectly a dominant influence by virtue of their ownership of it, their financial participation therein, or the rules which govern it".[34] The Open Data Directive applies to existing documents (including data) held by public undertakings, excluding documents produced or obtained outside the scope of "the provision of services in the general interest as defined by law or other binding rules in the Member State".[35] The Directive does not cover information related to activities directlyexposed to competition and, therefore, not subject to procurement rules pursuant to Article 34 of the Directive 2014/25/EU, which governs the procurement of entities operating in the water, energy, transport, and, postal services sectors.[36]

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[29] For the definition of 'bodies governed by public law', see Open Data Directive, Art. 2(2).

[30] The term 'document' is defined in Art. 2(6) of the Open Data Directive as: a) 'any content whatever its medium (paper or electronic form or as a sound, visual or audiovisual recording)'; or b) 'any part of such content'. Following Recital 30 of the same Directive, the term 'document' 'should cover any representation of acts, facts or information — and any compilation of such acts, facts or information — whatever its medium (paper, or electronic form or as a sound, visual or audiovisual recording)'. Although not explicitly mentioned in the definition, the broadness of the term 'document' allows to include data under its scope. In fact, from the title and text of the Open Data Directive, it can be concluded that data are one of the forms of PSI that receive most attention in this new legislation. For this reason, the word 'data' (or 'information') will be used in place of 'document' when referring to the provisions in the Open Data Directive in this chapter.

[31] Open Data Directive, Art. 1, par. 2(a).

[32] See Recital 10 of the PSI Directive.

[33] Such as gas and heat, electricity, drinking water, different kind of transport services and postal services. For the full list of sectors, see Art. 1, par. 1 (b) of the Open Data Directive.

[34] Open Data Directive Art. 2(3).

[35] Open Data Directive Art. 1, par. 2 (b)(i).

[36] Open Data Directive Art. 1, par. 2 (b)(ii). Recital 19 of the Directive encourages Member States to go beyond the minimum requirements set forth by the Directive and apply its rules for data held by public undertakings even in such cases.

**c) Publicly funded research data -Art.1(c) and Art. 10.**

The Open Data Directive applies to research data[37] insofar as they are publicly funded and they have been made publicly available through an institutional or subject-based repository.[38] Due to the very specific nature of research data, theywill be left outside of the scope of this chapter.

Interestingly, the Open Data Directive does not directly introduce a formal definition of PSI. As explained above, the normative provisions of the Directive refer and apply to *'documents'* (including data) that are held by organisations of a public nature (PSBs and public undertakings), and to publicly funded research data. The 2003 PSI Directive included a clarification of the meaning of the expression *'held'*. According to Recital 11, a document held by a PSB is "a document where the public sector body has the right to authorize re- use". The Open Data Directive currently in force does not include this clarification.

Recital 13 of the Open Data Directive refers to PSI as a synonym of "information collected, produced, reproduced, and disseminated within the exercise of a public task or a service of general interest". However, this notion is not included as such in the list of legal definitions in Article 2, and it is only used in Article 1, par. 2 to delineate the negative scope of the Directive, i.e., certain types of data held by PSBs and public undertakings which are *not* covered by the provisions of the Directive, as described above.

Against this backdrop, it can be concluded that the main criterion used in the Open Data Directive to define which information (including data) should be covered by its provisions is that they are held by entities of a public nature (PSBs and certain public undertakings). A secondary criterion found in the Directive for data that are not directly held by a PSB or a public undertaking, is that the data have been publicly funded. However, this applies only to research data.

In terms of regulatory approach, the Open Data Directive sets minimum harmonizing rules governing the conditions applicable to the re-use of PSI by individuals and businesses, in particular: procedures, format, charging, licenses and, in some cases, an obligation to allow re-use. It also includes provisions based on the principles of transparency, non- discrimination, prohibition of cross-subsidization and

[37] 'Research data' are "documents in a digital form, other than scientific publications, which are collected or produced in the course of scientific research activities and are used as evidence in the research process, or are commonly accepted in the research community as necessary to validate research findings and results". Open Data Directive, Art. 2(9).

[38] Open Data Directive, Art. 10, par. 2.

prohibition (or strict limitation) of exclusive arrangements. Although the name of the Open Data Directive might suggest otherwise, its minimum harmonizing rules do not include a general obligation of proactively publishing all data held by the public sector. In fact, the provisions in the Directive are conceived in principle for access and re-use following requests lodged by the re-users.

There are multiple sub-regimes within the Open Data Directive. The furthest-reaching rules apply to PSBs other than (university) libraries, museums and archives. They entail, among others, an obligation to allow re-use of the PSI they hold,[39] limitations to the charges for re-use (re-use should be in principle free of charge, but recovery of marginal costs is allowed),[40] and specific rules governing the processing of requests.[41]

The rules that apply to public undertakings and PSBs that are (university) libraries, museums and archives are less stringent. Unless otherwise provided by EU or national law, these organisations are not obliged to allow re-use of the information they hold,[42] and are exempted from the rule that limits the charges for re-use to the marginal costs therein incurred, being allowed to include in the charges a reasonable return on investment.[43] Moreover, following Art. 4, par. 6 of the Open Data Directive, public undertakings are not covered by the rules governing the processing of requests.

One of the novelties of the Open Data Directive is the introduction of a new set of rules applicable specifically to 'high-value datasets'. They are datasets held by PSBs and public undertakings the re-use of which is expected to yield significant benefits for society, the environment and the economy, due to their suitability to be used for the creation of value- added products and services, among other factors.[44] Annex I of the Directive includes a list of thematic categories of high-value datasets: geospatial, earth observation and environment, meteorological, statistics, companies and company ownership and mobility. This thematic list can be adjusted by the European Commission by means of delegated acts "in order to reflect technological and market developments".[45]

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[39] Open Data Directive, Art. 3, par. 1. See also Recital 23.

[40] Open Data Directive, Art. 6. See also Recital 36. Art. 6, par. 2 (a) creates an exception to this rule for PSBs that are 'required to generate revenue to cover a substantial part of their costs relating to the performance of their public tasks'. For the re-use of PSI held by such entities, the total charges shall be laid down by Member States, following objective, transparent and verifiable criteria (Art. 6, par. 4).

[41] Open Data Directive, Art. 4.

[42] Open Data Directive, Art. 3, par. 2.

[43] Open Data Directive, Art. 6, par. 2, 4 and 5. 'Reasonable return on investment' is defined in the same Directive as "a percentage of the overall charge, in addition to that needed to recover the eligible costs, not exceeding 5 percentage points above the fixed interest rate of the [European Central Bank]" Art. 2 (16), Open Data Directive.

[44] For the full legal definition of 'high-value datasets' see Article 2 (10) of the Open Data Directive.

[45] Open Data Directive, Art. 13, par. 2.

The list of specific high-value datasets belonging to the aforementioned categories shall be laid down by the European Commission by means of implementing acts, which may also specify the arrangements for the publication and re-use of such datasets.[46] The identification of the high-value datasets should be based on the expected socioeconomic and environmental benefits, the types of products and services that can be created with them, the number of re-users that would be benefited, and the potential to generate revenue and to be combined with other datasets.[47]

Due to their socioeconomic relevance, high-value datasets are subject to special rules under the Open Data Directive, which aim at "ensuring their maximum impact and to facilitate re-use".[48] For example, such datasets shall be (i.e. this is not optional) made available for re-use in machine-readable form, via suitable Application Programming Interfaces (APIs) and, where relevant, as a bulk download.[49] In terms of re-use fees, high- value datasets should be made available free of charge.[50] However, this requirement can be unapplied in the case of datasets held by public undertakings, when it "would lead to a distortion of a competition in the relevant markets".[51] At the moment of writing, the European Commission is preparing an implementing act with a list of high-value datasets, which should be adopted in the first quarter of 2021.[52]



### 5.2.2. Sharing of private sector data

The notion of 'private sector data' is not clearly delineated in EU data sharing legislation or policy. The OECD understands this type of data as being "generated, created, collected, processed, preserved, maintained, disseminated or funded by or for private sector",[53]clarifying that 'private sector' refers to "private corporations, households and non-profit institutions serving households".[54] The European Commission uses the expressions privately-held data, or, private sector data, in a narrower sense, to refer to

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[46] Open Data Directive, Art. 14, par. 1.

[47] Open Data Directive, Art. 14, par. 2. Examples of specific high-value datasets are provided in Recital 66 of the Directive: "postcodes, national and local maps (geospatial), energy consumption and satellite images (earth observation and environment), in situ data from instruments and weather forecasts (meteorological), demographic and economic indicators (statistics), business registers and registration identifiers (companies and company ownership), road signs and inland waterways (mobility)."

[48] Open Data Directive, Recital 69.

[49] Open Data Directive, Art. 14, par. 1, points (b) to (d).

[50] Open Data Directive, Art. 14, par. 1, point (a).

[51] Open Data Directive, Art. 14, par. 3.

[52] See 'Open Data – Availability of Public Datasets' (*Have your say*) <https://ec.europa.eu/info/law/better-regulation/have-your-say/initiatives/12111-Open-data-availability-of-public-datasets> accessed 19 February 2021. See also section 5.4.1.3. of this chapter.

[53] OECD, *Enhancing Access to and Sharing of Data* (n 14) 27.

[54] OECD, 'OECD Glossary of Statistical Terms - Private Sector Definition' <https://stats.oecd.org/glossary/detail.asp?ID=2130> accessed 23 June 2020.

data held by private companies or businesses.[55] Since this chapter focuses on EU data sharing law and policy, the latter notion will be employed.

Business-to-business (B2B) data sharing is not subject to a legal framework that specifically targets private sector data and that is as comprehensive as the G2B regime above referred. For B2B data sharing, the current policy approach in the EU can be summarized in the following aspects, taken from documents published by the European Commission:[56]

- As a rule, B2B data sharing should take place voluntarily. Freedom of contract is seen as the cornerstone of B2B data sharing.

- Non-regulatory measures, such as the creation of an EU Support Centre for data sharing[57] and the provision of guidance, are favored over regulatory measures.

- Compulsory data sharing regimes (or data access rights) can be created where a market failure is identified or expected, and competition law cannot solve this. Moreover, compulsory data sharing should be only sector-specific and should take place under fair, transparent, reasonable, proportionate and/or non-discriminatory conditions.[58]

### 5.2.3. Observations from the analysis of EU law and policy

The previous sections examined EU legislation and policy applicable to data sharing for the purposes of fostering innovation and economic growth. Two broad data sharing regimes were analyzed. On the one hand, the regime applicable to the re-use of public

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[55] European Commission, 'Towards a Common European Data Space COM(2018) 232 Final' (n 6); European Commission, 'Commission Staff Working Document "Guidance on Sharing Private Sector Data in the European Data Economy"' (n 5); European Commission, 'A European Strategy for Data, COM/2020/66 Final' (n 2).

[56] European Commission, 'Towards a Common European Data Space COM(2018) 232 Final' (n 6); European Commission, 'Commission Staff Working Document "Guidance on Sharing Private Sector Data in the European Data Economy"' (n 5); European Commission, 'A European Strategy for Data, COM/2020/66 Final' (n 2).

[57] Support Centre for Data Sharing, 'Support Centre for Data Sharing' <https://eudatasharing.eu/> accessed 22 September 2020.

[58] European Commission, 'A European Strategy for Data, COM/2020/66 Final' (n 2) footnote 39. Examples of sector-specific legislation creating data sharing obligations or data access rights are the Directive (EU) 2015/2366 (concerning payment services in the internal market) and the Directive 2019/944 [see Chapter 4 of this dissertation]. For a description and analysis of these two and other sector-specific data sharing regimes, see Charlotte Ducuing, 'Data as Infrastructure? A Study of Data Sharing Legal Regimes' (2020) 21 Competition and Regulation in Network Industries 124 <https://doi.org/10.1177/1783591719895390> accessed 20 August 2020; Ducuing (n 8); Feasey and de Streel (n 8).

sector data (G2B data sharing), and on the other hand, the regulatory approach for the sharing of privately-held data (B2B data sharing). From this analysis, it was observed that the main criterion to assert which regime applies in a given case is the public or private nature of the data holder.

During this analysis, it was discovered that there are important differences in regulatory approach for data sharing in each sector, and thus the importance of knowing whether certain data fall under one or the other category. G2B data sharing is largely regulated, bymeans of legislation that aims at facilitating and harmonizing public sector data re-use across the EU, to the benefit of a broad and undetermined number of re-users across different productive sectors. The Open Data Directive regulates the conditions under which G2B data sharing takes place and introduces special provisions to foster the re-use of high- value datasets. This legislation is rooted in the idea that data held by the public sector should be made broadly available so that businesses (and citizens) can create innovative products and services.



Contrastingly, the preferred regulatory approach for B2B data sharing is that the involved parties can freely decide whether to share data and under which conditions. EU policymakers are rather reluctant to introduce horizontal rules for the sharing of private sector data. Regulatory intervention to mandate data sharing and/or standardize the applicable conditions is usually exceptional (if there is a market failure that cannot be addressed by competition law) and sector specific. Moreover, in the B2B context, the beneficiaries of data sharing usually are a limited range of re-users, chosen voluntarily by the data holder or as prescribed by sector-specific regulations.

## 5.3. The shortcomings of the public-private data dichotomy

Having two separate data sharing regimes depending on whether data are publicly or privately held, might be useful to give order and structure the lines of action of the European Commission and academic discussions around data sharing. However, as will be explained in this section, this binary approach presents a number of shortcomings. The first two issues have to do with the criterion that triggers the application of the G2B or B2B data sharing regime, that is, that data are held by a public or private organisation. The other two issues relate to the underlying assumption that only public sector data should be regulated and made broadly available for re-use, while the sharing of private sector data should remain largely unregulated or be regulated only at a sectoral level.

### 5.3.1. The legal meaning of "holding data" is not clear

As seen in Part 2, EU legislation and policy on data sharing rely on the notions of publicly- held data and privately-held data to identify the applicable (legal) regime in each case. Interestingly, *'holding data'* is an expression that does not have a clearly defined legal meaning. As previously mentioned, Recital 11 of the 2003 PSI Directive explained that a document is considered 'held' by a PSB when the PSB has the right to authorize re-use.[59]

The problem is that it is not always clear who has the right to authorize the sharing of data under EU and Member State law, especially in the case of co-generated (industrial) data that do not qualify as personal following the General Data Protection Regulation (GDPR).[60] The GDPR grants certain rights or entitlements to the data subjects to control access to data concerning them.[61] Those control rights are usually not recognized in respect of non-personal data, such as industrial data.

The expression 'holding data' has been used as a functional substitute for 'owning' data because in the legal tradition of EU Member States data cannot be seen as property.[62] Even legal instruments that have been traditionally used to protect and define entitlements to control the access to intangible assets, such as intellectual property rights (including database protection) and trade secret protection, these are increasingly deemed inadequate in the context of the data economy.[63] Moreover, they are especially difficult to apply to raw, unstructured and/or machine-generated data.

Therefore, due to the general absence of legally recognized rights defining who is entitled to allow or restrict the access to non-personal data, these rights are often agreed upon contractually or exercised *de facto.* This lack of clarity concerning what

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[59] The proposed Data Governance Act (discussed later in section 5.4.1.1.) echoes this understanding with its definition of 'data holder' as the legal person or data subject who has the right to grant access to or to share certain data, in accordance with applicable EU or national law. Art. 2(5) of the Proposal for a Data Governance Act.

[60] Regulation (EU) 2016/679 of the European Parliament and of the Council of 27 April 2016 on the protection of natural persons with regard to the processing of personal data and on the free movement of such data, and repealing Directive 95/46/EC, OJ L 119, 1–88. Art. 4(1) of the GDPR defines personal data as 'any information relating to an identified or identifiable natural person ('data subject')'.

[61] For example, the rights to restriction of processing (Art. 18 of the GDPR) or to data portability (Art. 20 of the GDPR).

[62] See e.g., Eric Tjong Tjin Tai, 'Data Ownership and Consumer Protection' (2018) 7 Journal of European Consumer and Market Law <https://kluwerlawonline.com/journalarticle/Journal+of+European+Consumer+and+Market+Law/7.4/EuCML2018029>; Lothar Determann, 'No One Owns Data' (2019) 70 Hastings Law Journal 1 <https://www.hastingslawjournal.org/no-one-owns-data-2/>.

[63] Sofia Oliveira Pais, 'Big Data and Big Databases between Privacy and Competition' [2020] Legal Challenges of Big Data <https://doi.org/10.4337/9781788976220> at 2.2.

is the exact legal scope of 'holding data', makes it a questionable criterion to classify the data as public or private. In turn, this raises questions about the adequacy of building data sharing regimes around this distinction.

### 5.3.2. Difficulties to classify data in public-private collaborations

Another problem with the public-private data binary is that it assumes that data can be easily classified as public or private. However, data are increasingly collected or produced in settings where multiple stakeholders, both from the public, and private sector, intervene,[64] whereby it is becoming very difficult to make a clear distinction between public and private sector data. Smart cities are a good example of this. In a smart city context, local authorities usually collaborate with private organizations that provide the technology and expertise required to collect and process data about the city and the citizens.[65]



Consider for instance a smart city project in which data are collected with sensors that are owned and operated by a private actor but are installed in public space. Asserting the public or private status of such data based solely on who has factual control over them might prove insufficient, to the extent that it would allow private appropriation of data that have been collected in public space, in the context of a project developed with public local authorities.

If the data of this example were to be considered as privately held, the sharing and re-use of them would follow the B2B approach explained earlier in this chapter. In contrast, if the data were to beconsidered as publicly held, the sharing and re-use of them would have to follow thepreviously examined G2B rules. This binary approach does not contemplate that data can be simultaneously held by the public and the private sector, in cases where actors from both sectors contributed to their collection.

As previously noted, there is little clarity regarding the legal entitlements ascribed to data holders. The parties in smart city collaborations usually seek to fill those legal gaps with contractual agreements. However, as illustrated by the discussions about data governance in the (now defunct) smart city project 'Sidewalk Toronto', given the multiplicity of actors,interests and contextual factors at stake, defining entitlements

[64] See Madison (n 8).

[65] For a comprehensive discussion on the elements that characterize a smart city, see Lorenzo Dalla Corte, 'Safeguarding Data Protection in an Open Data World: On the Idea of Balancing Open Data and Data Protection in the Development of the Smart City Environment' (Tilburg University 2020) <https://research.tilburguniversity.edu/en/publications/safeguarding-data-protection-in-an-open-data-world-on-the-idea-of> accessed 24 July 2020.

and responsibilities in relation to data in a smart city is a very complex exercise.[66] The criterion of who holds the data is not sufficient to determine the legal treatment that should be applied to the (sharing of) data collected in a smart city, and in other complex settings where both public and private actors contribute to the creation or collection of data.

### 5.3.3. Increasing involvement of the private sector in the production of data with high socio-economic value

The private sector is every time more active in the creation of data that could arguably be considered as public for the purposes of accessibility and re-use. This is a consequence of the growing involvement of private actors in the 'public sphere', understood by Taylor as the space "where public functions are performed and matters of public concern are dealt with".[67]

On the one hand, this is evidenced by the growing delegation to the private sector of activities that are typically considered a responsibility of the state. This was acknowledged by the European Commission when carrying out the review of the PSI Directive that led to the adoption of the Open Data Directive. During the review, the Commission recognized as problematic that many datasets of considerable socio-economic value were 'shielded' from the PSI regime to the extent that the PSI Directive applied only to data held by PSBs.[68]

The Commission explored the possibility of extending the scope of the Directive, to cover also data held by publicly owned (utility) companies and private entities entrusted with public tasks (on the basis of public service contracts).[69] However, due to lack of political consensus, the new provisions of the Open Data Directive ended up covering only public undertakings (as explained section 5.2.1 of this chapter) and not private undertakings. The choice of applying the Directive to the latter was ultimately left to the Member States, which are encouraged to go beyond the minimum harmonizing rules and apply its provisions to private undertakings, "in particular those that provide services of general interest".[70]

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[66] See Scassa (n 8).

[67] Linnet Taylor, 'Public Actors Without Public Values: Legitimacy, Domination and the Regulation of the Technology Sector' (2021) 34 Philosophy & Technology 897, 900 <https://doi.org/10.1007/s13347-020-00441-4>.

[68] European Commission, 'Inception Impact Assessment - Review of the Directive on the Re-Use of Public Sector Information (Directive 2003/98/EU)' (European Commission 2017) Ares(2017)4540429 2 <https://ec.europa.eu/info/law/better-regulation/have-your-say/initiatives/1096-Review-of-the-Directive-on-the-re-use-of-public-sector-information-Directive-2013-37-EU-> accessed 9 July 2020.

[69] European Commission, 'Inception Impact Assessment - Review of the Directive on the Re-Use of Public Sector Information (Directive 2003/98/EU)' (n 68) 2.

[70] Open Data Directive, Recital 19.

On the other hand, the private sector produces more data that can be of public relevance, even in the absence of legal or contractual ties with the public sector. This is especially evident in the case of big technology companies, which, as Taylor explains, have the ability of acquiring mass influence through the engagement of people with the platforms or services they offer.[71] She argues that this engagement effectively makes these private actors public service providers, and gives the example of the partnership between Google and Apple in the context of the Covid-19 pandemic. Being by far the two largest providers of smartphone operating systems around the world, these two private companies were able to develop a technological framework that has been used by governments and research institutions in several countries to enhance their contact tracing strategies.[72]



The pervasiveness of the private sector is also illustrated by the on-going discussions regarding access to private sector data by the public sector for public interest reasons in the EU (B2G data sharing). The core idea behind B2G data sharing is that the private sector holds data that have 'a high potential to serve the general public interest by informing decision making, […] enabling more targeted interventions and improving public service delivery'.[73]

Data to which, in principle, the public sector does not have direct access and that could obtain (exclusively or at least more efficiently) from the private sector. For example, mobility data, health data, and financial data. The B2G debate is outside the scope of this chapter. However, it illustrates a change in paradigm that is relevant for the analysis in this chapter: the position of the public sector as the major holder of the most valuable datasets is being contested by the private sector.[74]

When the first legislation on the re-use of PSI was being prepared, States were considered the major holders of vast amounts of information with high economic potential when used to create added-value products and services.[75] The role of the private sector was limited to re-use and exploit such information. As illustrated in

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[71] Taylor (n 67) 898.

[72] Taylor (n 67) 898. See also Kari Paul, 'Apple and Google Release Phone Technology to Notify Users of Coronavirus Exposure' (*The Guardian*, 20 May 2020) <http://www.theguardian.com/technology/2020/may/20/apple-google-phone-app-trace-coronavirus> accessed 21 February 2021.

[73] European Union (n 19) 13.

[74] See e.g., European Union (n 19); Jennifer Shkabatur, 'The Global Commons of Data' (2019) 22 Stanford Technology Law Review 354, 357 <https://heinonline.org/HOL/P?h=hein.journals/stantlr22&i=356> accessed 14 September 2020.

[75] See European Commission, 'Proposal for a Directive of the European Parliament and of the Council on the Re-Use and Commercial Exploitation of Public Sector Documents' (2002) COM(2002) 207 final — 2002/0123(COD) <https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=COM:2002:0207:FIN>.

this section, such dynamics have changed, and the private sector is every time more active in the production of data with high economic and social value.

### 5.3.4. Fragility of the public-private data dichotomy in the context of organisational change

The current regulatory approach to data sharing can lead to scenarios in which changes in the public or private status of the data holder would alter the public or private status of the data and the applicable data sharing regime. This is more problematic when public sector organizations are privatized. In practice, this would mean that data that were initially subject to the more open and re-use friendly rules of the Open Data Directive would then be subject to the B2B regime if the data holder becomes a private organization.

The Open Data Directive does not include provisions to deal with such situation. Thus, the more public organizations are privatized, less data will be covered by the Open Data Directive. As noted by Ricolfi et al, the fact that certain datasets cease to be available for re-use as a result of an organizational change, affects negatively the emergence of markets of value-added services based on such datasets.[76]

### 5.3.5. Summarizing the shortcomings

As previously shown, the current approach to regulating data sharing depending on whether the data are held by the public or the private sector has significant shortcomings. The issues explained in section 5.3.1. and section 5.3.2. point at the practical difficulties of making a clear distinction between private and public sector data, solely on the basis of the status of the data holder. The issues explained in section 5.3.3. and section 5.3.4. point at a more fundamental question.

The role of the private sector in the production of data with high socioeconomic value is every time more prominent, as private actors increasingly intervene in the 'public sphere' as a result of delegation, privatization or *de facto,* through the mass engagement of people with their platforms or services. This combination of circumstances is leading to a scenario in which private actors might outrival the public sector and become major holders of datasets with high socioeconomic value.

The current regulatory approach does not acknowledge this important change in paradigm, generally displaying a certain reluctance to regulate the sharing of private sector data beyond sector-specific intervention. This reluctance is quite

[76] Marco Ricolfi and others, 'The Exclusion of "public Undertakings" from the Re-Use of Public Sector Information Regime' (2011) 2011 Informatica e Diritto 147, 152.

evident in the previously analyzed Open Data Directive, which does not apply to data from the private sector even when private entities are entrusted with a public sector task or with the provision of services of general interest. The Directive still pays too much attention to the public nature of the data holder neglecting other aspects, such as the context in which data are produced or the value of data for the economy and society, that could justify bringing privately held data under its scope.

In light of the above, it is problematic that data sharing for the purposes of innovation and economic growth is currently regulated under the assumption that there are always hard lines between public and private sector data.



## 5.4. A glimpse of the future: toward a more comprehensive regulation of data sharing?

After exposing the public-private data dichotomy in the current data sharing legislation and policy and identifying its shortcomings, this section will now discuss how the landscape will evolve in light of the regulatory proposals announced in the European Commission's communication 'A European strategy for data' published in 2020 (hereinafter, the Data Strategy).[77] This section will also provide a number of starting points to advance the discussion on the issues identified in this chapter.

### 5.4.1. The Data Strategy and the public-private data dichotomy

The Data Strategy published in 2020 announced a number of regulatory interventions at horizontal and sectoral level concerning data sharing. An overview of their key points and their link with the issues raised in this chapter are provided in the following sub-sections.[78]

#### *5.4.1.1. The Data Governance Act*

The proposal for a regulation on European data governance, known as the Data Governance Act, is intended to 'foster the availability of data for use by increasing trust in data intermediaries and by strengthening data-sharing mechanisms across the EU'.[79] The proposed Act, published by the European Commission in

[77] European Commission, 'A European Strategy for Data, COM/2020/66 Final' (n 2).

[78] This part incorporates developments up to February 17, 2021. [**Note after publication of the article:** see the addendum at the end of this chapter for an update and a reflection on relevant legislative developments after the publication of the original article].

[79] European Commission, 'Proposal for a Data Governance Act' (n 5) 1. Hereinafter, 'Proposal for a Data Governance Act'.

November 2020, maintains the approach of taking different measures for G2B and B2B data sharing.

For G2B data sharing, the proposed Data Governance Act would introduce a framework to allow the re-use of certain types of data that are explicitly excluded from the scope of the Open Data Directive. That is, data protected on the grounds of commercial confidentiality, statistical confidentiality, intellectual property rights of third parties and personal data protection.[80]

The conditions to be introduced by the Data Governance Act include: firstly, a prohibition of exclusive agreements concerning the re-use of protected data; secondly, transparency and non-discrimination requirements; thirdly, the possibility of requiring data users to access and re-use data within secure processing environments; and additionally, conditions for the charging of re-use fees.[81]

For B2B data sharing, the envisioned Data Governance Act would take measures oriented to the professionalization of providers of data sharing services,[82] to increase the trust and incentivize data holders and data users to exchange data voluntarily. This would be done through a notification procedure for providers of data sharing services and the introduction of a number of requirements, including a neutrality requirement which prevents that they can use the shared data for other purposes.[83] The proposed Data Governance Act would not regulate the specific conditions under which B2B data sharing should take place. An interesting novelty of the proposed Data Governance Act is that it would introduce for the first time legal definitions of 'data',[84] 'data holder'[85], 'data

[80] Art. 3(1) of the Proposal for a Data Governance Act.

[81] See Chapter II of the Proposal for a Data Governance Act.

[82] For the list of data sharing services, see Article 9 of the Proposal for a Data Governance Act.

[83] For the full list of requirements, see Article 11 of the Proposal for a Data Governance Act.

[84] Proposal for a Data Governance Act, Art. 2 (1): "data' means any digital representation of acts, facts or information and any compilation of such acts, facts or information, including in the form of sound, visual or audiovisual recording'. This definition seems to be based on the definition of 'document' in the Open Data Directive (see Recital 30 of the Directive). Strictly speaking, the proposed Data Governance Act would not be the first legislation to introduce a definition of data. However, previous definitions of 'data' in EU law are rather circular. For example, the General Data Protection Regulation (GDPR, (EU) 2016/679), defines 'personal data' as information relating to identified or identifiable natural persons (Art. 4(1)). The Regulation on a framework for the free flow of non-personal data (EU 2018/1807) defines 'data' as data other than personal data as defined by the GDPR (Art. 3(1)).

[85] Proposal for a Data Governance Act, Art. 2 (5): "data holder' means a legal person or data subject who, in accordance with applicable Union or national law, has the right to grant access to or to share certain personal or non-personal data under its control'.

user'[86], 'data sharing'[87], and 'access'[88], among others. Although the envisioned scope of the Data Governance Act is rather limited,[89] if adopted, the new definitions will likely be used as a reference for future data sharing legislation or policies.

#### *5.4.1.2. The Data Act*

The scope of an eventual Data Act is not, at present, well delineated. Following the Data Strategy, the Data Act may introduce measures concerning business-to-government (B2G)and B2B data sharing. For B2B data sharing, the approach described in section 5.2.2. will be largely maintained. The intervention will be mostly targeted at facilitating voluntary data sharing. This will be achieved by addressing issues such as usage rights for co-generated data, unnecessary hurdles to data sharing, and legal liability. Mandatory access to data in the B2B context might take place 'only where specific circumstances so dictate'.[90]

The Data Act could possibly revise the legal framework for intellectual property rights (in particular, database and trade secret protection) 'with a view to further enhance data access and use'.[91] Against this backdrop, the Data Act might (at best) help to clarify part of the issues previously highlighted in section 5.3.1 and section 5.3.2 of this chapter, concerning the scope of the rights of data holders, especially in the case of non-personal co-generated data. However, its envisioned scope, in principle, would not address the shortcomings explained in section 5.3.3 and section 5.3.4.

#### *5.4.1.3. The Implementing Act on High-Value Datasets*

This regulatory instrument will be adopted pursuant to the Open Data Directive. The implementing Act will be crucial to achieve the Directive's goal of improving the accessibility and re-use of public sector data, since it will identify specific datasets with high potential for re-use, considering their socioeconomic and environmental benefits that canbe derived from them. It will also introduce rules (e.g., concerning format, charging and ways of publication) to facilitate the re-use of the identified

[86] Proposal for a Data Governance Act, Art. 2 (6): "data user' means a natural or legal person who has lawful access to certain personal or non-personal data and is authorized to use that data for commercial or non-commercial purpose.'

[87] Proposal for a Data Governance Act, Art. 2 (7): "data sharing' means the provision by a data holder of data to a data user for the purpose of joint or individual use of the shared data, based on voluntary agreements, directly or through an intermediary'.

[88] Proposal for a Data Governance Act, Art. 2 (8): "access' means processing by a data user of data that has been provided by a data holder, in accordance with specific technical, legal, or organisational requirements, without necessarily implying the transmission or downloading of such data'.

[89] Proposal for a Data Governance Act, Art. 1.

[90] European Commission, 'A European Strategy for Data, COM/2020/66 Final' (n 2) 13.

[91] European Commission, 'A European Strategy for Data, COM/2020/66 Final' (n 2) 13.

datasets. This will be done with the aim of increasing their impact. The specific content of the implementing act is not known yet, but it is expected that it will be adopted in 2021.

This measure targets only public sector data, hence, it does not directly help to address the issues identified in Part 3. However, the Inception Impact Assessment of the envisioned suggests that high-value datasets will also become 'reference data for other (public or private sector) data and encourage the re-use of these related data (e.g., high value public geospatial data bundled with data derived from sensors or mobile devices/cars)'.[92]

#### *5.4.1.4. The common European data spaces*

Next to horizontal regulatory measures, the Data Strategy also announced sectoral intervention to support the development of nine common European data spaces in strategic sectors and domains of public interest: industrial (manufacturing), Green Deal, mobility, health, financial, energy, agriculture, public administration and skills.[93] The notion of 'data spaces' is not clearly defined in the Data Strategy, but the text describes them as encompassing data sharing architectures (including standards and tools) and governance mechanisms.

The intervention envisioned by the Commission might include 'legislation for data access and use, and mechanisms for ensuring interoperability.'[94] What is interesting about these data spaces is that they aim at pooling both publicly held data and privately held data for use in the abovementioned domains,[95] although the extent to which that is possible depends on the specific sector.[96] The Commission also wants to encourage use and sharing of data across sectors.

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[92] European Commission, 'Inception Impact Assessment - Implementing Act on a List of High-Value Datasets' (European Commission 2020) Ares(2020)3977569 2 <https://ec.europa.eu/info/law/better-regulation/have-your-say/initiatives/12111-Implementing-act-on-a-list-of-High-Value-Datasets> accessed 29 September 2020.

[93] European Commission, 'A European Strategy for Data, COM/2020/66 Final' (n 2) Appendix.

[94] European Commission, 'A European Strategy for Data, COM/2020/66 Final' (n 2) 21.

[95] In this regard, the Inception Impact Assessment for the implementing act on a list of High-Value Datasets states: 'The European Strategy for Data of 19 February 2020 incorporates the [High-Value Datasets] as a common data layer facilitating, in conjunction with data coming from the private sector, the rollout of sectoral data spaces in strategic areas such as manufacturing, environment, agriculture, energy, finance and mobility', European Commission, 'Inception Impact Assessment - Implementing Act on a List of High-Value Datasets' (n 92) 1.

[96] For example, the industrial data space seems to be mostly intended for private actors only, while the data spaces for mobility, health and agriculture data space lend themselves better to pooling both private and public sector data.

There is still a great deal of uncertainty regarding the specific functioning of the data spaces, in terms of who can take part in them, the conditions that will apply to the sharing of data and how cross-sectoral data sharing will take place. Therefore, it is difficult to anticipate to which extent this initiative might contribute to overcome the shortcomings of the public-private dichotomy exposed in this chapter.

From the examination of the (envisioned) scope of the above measures, it is observed that the EU policymakers will largely continue to follow the current approach for regulating G2B and B2B data sharing. In addition, none of the measures here reviewed contributes significantly to address the shortcomings discussed in this chapter.



### 5.4.2. Starting points to further the discussion on the public-private data dichotomy

The limits between public and private sector data have become more fluid under the changing dynamics of data production. However, current and upcoming EU legislation and policy do not acknowledge that fluidity. This section proposes a number of starting points for further research and debate toward a more comprehensive regulation of data sharing.

The shortcomings identified in Part 3 of this chapter refer to two main problems of the public-private dichotomy. First, the distinction is difficult to apply in a context in which the rights of data holders are not well delineated, and in situations in which actors from both the public and private sector contribute to the creation of data. In this regard, further research, guidance and eventually regulatory intervention could contribute to clarify what 'holding data' means and the applicable legal regime for the sharing of data that have been created with the intervention of both public and private actors.

The second type of issues points at a more fundamental and difficult question. The private sector is increasingly entering the public sphere, due to delegation or privatization of public sector tasks, and due to the influence over the general public that especially big technology companies enjoy as a result of the engagement of citizens with their products and services. In that context, private actors are becoming, formally and informally, providers of public services. Yet, as a result of the current regulatory approach to data sharing, privately held data are excluded from the scope of regimes that foster the access to and re-use of data by a broad range of users, in particular, the Open Data Directive.

The problem with the Open Data Directive is that it targets public sector data, emphasizing the public nature of the data holder as the criterion that defines its scope and justifies the need to regulate how data should be made available. A possible way forward could be reframing the current understanding of what *'public'* means for the purposes of data accessibility and re-use, to allow that certain private datasets can also be covered by a horizontal data sharing regime, such as the Open Data Directive or a comparable legal instrument. This would entail understanding *'public data'* not as data held by the public sector but as data that should be made available for re-use by the general public (under certain conditions), regardless of the nature of the data holder.

A first step in that direction could be expanding the scope of the Open Data Directive, to cover not only data held by public sector entities but also privately held data, when private undertakings perform a public task or a service of general interest (such as the provision of utilities). The Open Data Directive left the door open for Member States to go beyond the minimum harmonizing rules and apply its requirements to private undertakings, particularly when they provide services of general interest.[97] The experiences of Member States when implementing this legislation might provide useful insights that could justify (or not) further expansion of the scope of the Open Data Directive.

At the time of writing, only Greece and France have transposed the Open Data Directive into national legislation. [98]The Greek legislation[99] did not go beyond the minimum harmonizing rules in the Open Data Directive, hence private undertakings are not included in its scope of application. In contrast, French legislation introduced since 2016 (already before the adoption of the Open Data Directive in 2019)[100] provisions requiring concessionaires of public services to provide the contracting public authority with the data(bases) collected or produced when operating the public service that are essential for the execution of the concession contract.[101]

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[97] Open Data Directive, Recital 19.

[98] As reported by the web portal of EU legislation 'EUR-Lex - 32019L1024 - EN - EUR-Lex' <https://eur-lex.europa.eu/legal-content/EN/NIM/?uri=uriserv:OJ.L_.2019.172.01.0056.01.ENG> accessed 19 February 2021. The transposition deadline of the Open Data Directive is July 17, 2021.

[99] ΝΟΜΟΣ ΥΠ' ΑΡΙΘΜ. 4727/2020.

[100] Art. 17 of the Loi n° 2016-1321 du 7 octobre 2016 pour une République numérique, JORF n°0235 8 october 2016. Currently enshrined in the Public Procurement Code, Codified by the Ordinance n° 2018-1074 of 26 november 2018 (portant partie législative du code de la commande publique), JORF n°0281 5 december 2018.

[101] Art. L3131-2 of the French Public Procurement Code, free translation.

The contracting authority can, directly or by means of third party, extract and use the data(bases), in particular "with a view of making them available free of charge for the purpose of re-use for free or against payment".[102] It remains to be seen whether the rest of the Member States will go beyond the minimum harmonizing rules of the Open Data Directive concerning private undertakings.[103]

The discussion can go further than just changing the scope of the Open Data Directive. A higher-level question to explore would be whether certain privately held datasets should be subject to a horizontal and cross-sectoral regime that facilitates re-use on the basis of the high socioeconomic value of the datasets, even if the data holders do not formally perform a public task or a service of general interest. This would acknowledge the increasing involvement of the private sector in the production of data with high socioeconomic relevance, and would break with the assumption that only data held by the public sector should be widely available for re-use.

Therefore, the question to be asked would be under which conditions privately held data could be subject to such regime? The notion of *'high-value datasets'* introduced by the Open Data Directive could be helpful in identifying which privately held datasets could be eligible for broad re-use. As stated previously, the European Commission expects that the rules concerning high-value datasets in the Open Data Directive and its implementing acts, will become a reference for other datasets, including those that are privately held. In addition, observing the development of the common European data spaces might also provide insights to articulate in which cases and under which conditions, privately held datasets could be made available for re-use across sectors.[104]

[102] Art. L3131-4 of the French Public Procurement Code, free translation.

[103] The bill of the legislation that will transpose the Open Data Directive in Germany, published On January 29, 2021 by the federal government, does not include private undertakings in the scope of application arguing that there are 'structural differences between public and private companies' (free translation), Bundesministerium für Wirtschaft und Energie, 'Gesetzentwurf der Bundesregierung: Gesetz zur Änderung des E-Government-Gesetzes und zur Einführung des Gesetzes für die Nutzung von Daten des öffentlichen Sektors' (2021) 3 <https://www.bmwi.de/Redaktion/DE/Downloads/G/gesetzentwurf-aenderung-des-e-government-gesetzes-und-%20Gesetz-fuer-die-nutzung-von-daten-des-oeffentlichen-sektors.pdf?__blob=publicationFile&v=8> accessed 19 February 2021.

[104] The European Commission is preparing a proposal for legislation to govern the European Health Data Space. Among the policy alternatives that will be explored, the Commission announced possible intervention concerning the re-use of data held by private data holders. European Commission, 'Inception Impact Assessment - A European Health Data Space' (2020) Ares(2020)7907993 <https://ec.europa.eu/info/law/better-regulation/have-your-say/initiatives/12663-A-European-Health-Data-Space-> accessed 18 February 2021. [**Note after the publication of the original article:** on May 3, 2022, the European Commission published a proposal for a Regulation on the European Health Data Space. See the addendum at the end of this chapter for a short explanation of the proposal.]

Furthermore, it would be necessary to identify the rationale that justifies that the general public could have access to privately held data for the purposes of re-use. In the case of public sector data, the implicit rationale is that the data have been obtained with taxpayers' money. Consequently, businesses and citizens should be allowed to benefit from public sector data by re-using it for commercial and non-commercial purposes. Since such basis is not present in the case of privately held data, EU policymakers would have to find a different rationale for that.

Another aspect to address is the extent to which regulating the sharing of privately held data would constitute a disproportionate burden for private companies, and whether it would reduce the incentives to keep investing in the production or collection of data. This issue was raised during the review of the PSI Directive that resulted in the adoption of the Open Data Directive, and it was one of the reasons adduced by the European Commission to propose a lower intensity policy package that did not include private undertakings in its scope.[105]

The rules introduced by the Open Data Directive for data held by public undertakings could serve as a reference to find a balance between the interests of the private data holders and the re-users. Of particular relevance here is the exemption from the rules governing the processing of requests for re-use. This also includes the possibility of charging re-use fees above marginal costs (including a reasonable return on investment). The future Data Governance Act, specifically the measures concerning protected data held by the public sector, could serve as a reference to devise mechanisms that allow the re-use of private datasets that are commercially sensitive (see section 5.4.1.1. of this chapter).

These starting points can guide further research toward a more comprehensive regulation of data sharing in the EU, beyond the limitations of the public-private data dichotomy here scrutinized.

## 5.5. Conclusions

This chapter has examined one of the dichotomies around which the EU rulemakers have built legislation and policies to facilitate and stimulate data sharing as a key element of a thriving data economy. Specifically, the distinction between public

[105] European Commission, 'Commission Staff Working Document - Impact Assessment Accompanying the Document "Proposal for a Directive of the European Parliament and of the Council on the Re-Use of Public Sector Information"' (2018) SWD(2018) 127 final 42.

sector and private sector data. The chapter has investigated the assumptions underlying the public-private data dichotomy and whether the distinction can still stand under the current dynamics of data production.

Data sharing for the purposes of fostering innovation and economic growth is regulated by two broad regimes in the EU, that is, one for publicly held data (G2B data sharing) and the other one for privately held data (B2B data sharing). This research has found that the main criterion to trigger the application of one or the other regime is the public or private nature of the data holder. Factors such as the context in which data are produced or the socioeconomic value of the data are not relevant to define the public or private character of data under the current legal and policy frameworks.



It has been observed that the two regimes follow a very different approach. G2B data sharing is much more regulated and aims at facilitating, and harmonizing, public sector data re-use across the EU to the benefit of a broad and undetermined range of re-users. In contrast, B2B data sharing is still largely unregulated and regulatory intervention to mandate data sharing and standardize its conditions is usually exceptional and sector specific. In the B2B context, the beneficiaries of data sharing are a selected number of re-users, chosen voluntarily by the data holder or mandatorily by the policymakers.

This contribution has argued that the public-private data dichotomy evidenced in the way EU policymakers approach the regulation of data sharing has important shortcomings. Firstly, *'holding data'* is still an expression with a vague legal meaning. Secondly, making a clear distinction between public and private sector data is becoming every time more difficult, consideringthat data are increasingly produced with the intervention of actors from both sectors.

The idea that only data from the public sector should be subject to regimes fostering re- use by the general public is coming under pressure as the private sector is more involved in the collection of data with high socioeconomic value, even in the absence of ties with the public sector. Against this backdrop, the main conclusion to be drawn from this chapter is that the public-private data dichotomy, as currently embodied in EU data sharing law and policy, has important flaws to the extent that it does not reflect the complexity and changing dynamics of data production.

This contribution does not claim that the distinction between public and private data for the purposes of data sharing is completely irrelevant or useless. It claims that this binary approach (as it is now) has limitations that should be acknowledged and addressed to develop a more consistent legal framework for data sharing.

This study has also offered 'a glimpse of the future' in terms of examining whether upcoming regulatory initiatives will address the shortcomings of the public-private data dichotomy identified in this chapter.

It is submitted that the Commission will largely keep the same approach when regulating G2B and B2B data sharing and that none of the reviewed measures contributes significantly to address the inadequacies of the public-private data dichotomy herein discussed. The chapter has also suggested avenues for further research to advance the academic and policy debate on how to regulate data sharing in a more consistent way, beyond the limitations of the dichotomy examined in this study.

Particular attention was devoted to the importance of breaking with the idea that only data from the public sector should be widely available for re-use and exploring whether and under which conditions privately held data could also be subject to a regime that facilitates accessibility by a broad range of re-users.

The legal and policy frameworks that will shape the EU data economy in the coming years are in the making. As noted by Graef, researchers play an important role in commenting on proposals from policymakers, in order to 'advance discussions about how to create value from data as a means to stimulate societal progress'.[106] In that spirit, the findings of this chapter contribute to the on-going academic and policy debate concerning the regulation of data sharing as a key subject of data governance.

## 5.6. Addendum: update after the publication of the article

This section provides an update on legislative developments occurred after the publication of the article mirrored in this chapter (June 2021). This update refers to some of the legislative measures discussed in section 5.4.1. of this chapter, focusing on the aspects that are relevant to the questions herein investigated.

### 5.6.1. The adopted Data Governance Act

The Data Governance Act (Regulation EU 2022/868)[107] was adopted on May 30, 2022. This new legislation lays down rules in four fronts:[108] a) conditions for the re-use of certain protected data held by public sector bodies; b) a framework for

[106] Graef (n 7) 24.

[107] Regulation (EU) 2022/868 of the European Parliament and of the Council of 30 May 2022 on European data governance and amending Regulation (EU) 2018/1724 (Data Governance Act) OJ L 152, 1–44.

[108] Article 1, paragraph 1, Data Governance Act.

the supervision of providers of data intermediation services; c) a framework for voluntary registration of data altruism[109] organizations; and d) a framework for the creation of the European Data Innovation Board.

Some of the definitions initially introduced in the proposal were adjusted in the final text (see e.g., the definition of data holder,[110] data user[111] and data sharing[112]). The definition of 'data holder' adopted in the final text of the Data Governance Act still relies on the imprecise notion of having the right to grant access or share certain data under EU or national law, and thus it does not offer more clarity regarding the issue identified in section 5.3.1. of this chapter.



Generally speaking, the adopted Regulation maintains the same approach of the proposal, i.e., it adopts different rules for G2B data sharing and B2B data sharing. For G2B data sharing there are several provisions regulating the re-use of special categories of public sector data, including a prohibition of exclusive arrangements and specific requirements for the conditions that public sector bodies must apply when allowing re-use, including rules about the fees that can be charged for such re-use.

For B2B data sharing, the Data Governance Act does not include provisions regulating the conditions that data holders must apply when making data available, nor does it create data sharing obligations for data holders. Instead, the Data Governance Act focuses on regulating the activities of providers of data intermediation services,[113] as the actors that will play the role of supporting and promoting voluntary data sharing

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[109] Data altruism refers to the voluntary sharing of a data subject's or a data holder's data, without receiving any reward, for objectives of general interest such as healthcare, mobility, the improvement of public services, policy making, among others. For the full legal definition, see Article 2(16) of the Data Governance Act.

[110] Art. 2(8) Data Governance Act: '"data holder"' means a legal person, **including public sector bodies and international organisations, or a natural person who is not a data subject with respect to the specific data in question, which,** in accordance with applicable Union or national law, has the right to grant access to or to share certain personal **data** or non-personal data' (emphasis added to show the changes to the text in the original text of the Proposal).

[111] Art. 2(9) Data Governance Act: '"data user' means a natural or legal person who has lawful access to certain personal or non-personal data and **has the right, including under Regulation (EU) 2016/679 in the case of personal data**, to use that data for commercial or non-commercial purposes' (emphasis added to show the changes to the text in the original text of the Proposal).

[112] Art. 2(10) Data Governance Act: '"data sharing' means the provision **of data** by a data **subject or a data** holder to a data user for the purpose of the joint or individual use of **such** data, based on voluntary agreements **or Union or national law**, directly or through an intermediary**, for example under open or commercial licences subject to a fee or free of charge**' (emphasis added to show the changes to the text in the original text of the Proposal).

[113] For the full definition and scope of what qualifies as a data intermediation service, see Article 2(11) of the Data Governance Act.

between businesses or facilitating data sharing following obligations laid down by EU or national laws.[114]

Confirming what was anticipated in this chapter when analyzing the proposal, the adopted Data Governance Act does not break with the public-private data dichotomy and does not help to address the shortcomings discussed in this chapter.

### 5.6.2. The Data Act Proposal

At the time of publication of the article mirrored in this chapter (June 2021), little was known about the content of the Data Act announced by the European Commission in the EU Data Strategy. In February 2022, the European Commission published a proposal for a Regulation 'on harmonised rules on fair access to and use of data (Data Act)'.[115]

The Data Act will lay down harmonized rules covering three main areas:[116]

i) **Access to data generated by the use of a product or a related service (Business-to-user data sharing, where the user can be a consumer or a business) – Chapter II of the Data Act Proposal.**

Article 3 of the Data Act Proposal introduces an obligation for data holders[117] (manufacturers of products and suppliers of related services) to make data[118] generated by the use of products[119] or related services[120] accessible by default to the users[121]

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[114] Recital 27, Data Governance Act.

[115] European Commission, 'Proposal for a Regulation of the European Parliament and of the Council on Harmonised Rules on Fair Access to and Use of Data (Data Act) COM(2022) 68 Final.' (2022) <https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:52022PC0068&from=EN> accessed 7 July 2022. Hereinafter, 'Data Act Proposal'.

[116] Article 1, par. 1, Data Act Proposal.

[117] Article 2(6) Data Act Proposal: "'data holder' means a legal or natural person who has the right or obligation, in accordance with this Regulation, applicable Union law or national legislation implementing Union law, or in the case of non-personal data and through control of the technical design of the product and related services, the ability, to make available certain data".

[118] Article 2(1) Data Act Proposal: "'data' means any digital representation of acts, facts or information and any compilation of such acts, facts or information, including in the form of sound, visual or audio-visual recording". This is the same definition introduced in the Data Governance Act.

[119] Article 2(2) Data Act Proposal: "product' means a tangible, movable item, including where incorporated in an immovable item, that obtains, generates or collects, data concerning its use or environment, and that is able to communicate data via a publicly available electronic communications service and whose primary function is not the storing and processing of data'.

[120] Article 2(3) Data Act Proposal: "'related service' means a digital service, including software, which is incorporated in or inter-connected with a product in such a way that its absence would prevent the product from performing one of its functions".

[121] Article 2(5) Data Act Proposal: "'user' means a natural or legal person that owns, rents or leases a product or receives a services".

(consumers or businesses). The data can be personal and non-personal. Article 4 introduces a right for users to access and use data generated by the use of products or related services, in cases in which data cannot be directly accessed by the user. Article 5 lays down a right for users to share their data with third parties, which entails that data holders are obliged to make available the users' data to a third party "without undue delay, free of charge to the user, of the same quality as is available to the data holder and, where applicable, continuously and in real-time".[122] Hence, the Data Act Proposal provides for an obligation to make available data generated by the use of a product or a related service, to the users themselves and to third parties authorized by the users.

The provisions in Chapter II of the Data Act Proposal stipulate the conditions under which access to data generated by the use of a product or a related service takes place. For example, access to these data is always free of charge for the users (although not for the third parties).[123] In addition, provisions are introduced regarding what the users and third parties can(not) do with the data received from the data holder,[124] as well as which third parties are not eligible to receive access to user data under this regime,[125] as well as an exemption for data generated by the use of products or related services provided by micro, small and medium enterprises.[126]



### ii) Provisions applicable to mandatory B2B data sharing – Chapter III of the Data Act Proposal

Chapter III of the Data Act Proposal lays down obligations that must be fulfilled by data holders legally obliged to make data available to data recipients.[127] These provisions

[122] Article 5, par. 1, Data Act Proposal.

[123] See Article 4, par.1 and Article 5, Data Act Proposal.

[124] Article 4(4), Data Act Proposal: "The user shall not use the data obtained pursuant to a request referred to in paragraph 1 to develop a product that competes with the product from which the data originate." For third parties, Article 6, par. 2 (b) and (c) prohibits that they use the received (personal) data for profiling or make the data available to another party, unless this is necessary to provide a service requested by the user. In addition, third parties are not allowed to share the received data to "an undertaking providing core platform services for which one or more of such services have been designated as a gatekeeper" pursuant to the upcoming Digital Markets Act (Article 6, par. 2 (d)). Third parties are also not allowed to use the received data to "develop a product that competes with the product from which the accessed data originate or share the data with another third party for that purpose" (Article 6, par. 2 (e)). However, it is allowed that third parties use the received data "to develop a new and innovative product or related service" (Recital 35).

[125] Article 5, par. 2 of the Data Act Proposal stipulates "[a]ny undertaking providing core platform services for which one or more of such services have been designated as a gatekeeper [pursuant to the Digital Markets Act], shall not be an eligible third party".

[126] Article 7, par. 1, Data Act Proposal.

[127] Article 2(7), Data Act Proposal: "'data recipient' means a legal or natural person, acting for purposes which are related to that person's trade, business, craft or profession, other than the user of a product or related service, to whom the data holder makes data available, including a third party following a request by the

apply to the sharing of data generated by the use of a product or a related service with third parties[128], as well as the sharing of data following other legal obligations under EU law or national legislation implementing EU law which enter into force after the date of application of the Data Act.[129] Recital 38 of the Data Act Proposal clarifies that voluntary data sharing does not fall under the scope of these rules.

The Data Act Proposal requires data holders to agree contractually with data recipients the terms under which data are made available.[130] Contractual terms that are unfair following Article 13 of the proposed Data Act[131] or that exclude the application or affect the rights of users under Chapter II of the proposed Act, shall not be binding. Data holders "shall not discriminate between comparable categories of data recipients"[132] and "shall not make data available to a data recipient on an exclusive basis unless requested by the user under Chapter II".[133]

Article 9 of the proposed Data Act regulates the compensation for making data available. As a general rule, "[a]ny compensation agreed between a data holder and a data recipient for making data available shall be reasonable".[134] Paragraph 2 of the said Article introduces a special regime when the data recipient is a micro, small or medium enterprise.[135] In this case, "any compensation agreed shall not exceed the costs directly related to making the data available to the data recipient and which are attributable to the request."[136] Finally, the Data Act Proposal stipulates that EU law or national legislation implementing EU law can exclude compensation for making data available or allow a lower compensation (Article 9, par. 3).

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user to the data holder or in accordance with a legal obligation under Union law or national legislation implementing Union law".

[128] Following Article 5 of the Data Act Proposal, explained in the previous section.

[129] Article 12, par. 1 and 3, Data Act Proposal.

[130] Article 8, par. 2, Data Act Proposal.

[131] Article 13 of the Data Act Proposal refers to "[u]nfair contractual terms unilaterally imposed on a micro, small or medium-sized enterprise".

[132] Article 8, par. 3, Data Act Proposal. Moreover, following the same provision, they have the burden of proof to demonstrate that there has been no discrimination.

[133] Article 8, par. 4, Data Act Proposal.

[134] Article 9, par. 1, Data Act Proposal.

[135] As defined in Article 2 of the Annex to Recommendation 2003/361/EC.

[136] Article 9, par. 2, Data Act Proposal.

### iii) B2G data sharing "where there is an exceptional need, for the performance of a task carried out in the public interest" – Chapter V of the Data Act Proposal.

One of the most interesting novelties of the proposed Data Act is that it intends to introduce a legal framework for making privately held data available to actors from the public sector (public sector bodies of the Member States[137] and EU institutions, agencies or bodies). However, the scope of this mandatory B2G data sharing regime is limited to situations where public sector actors have an exceptional need to use data held by private actors.

Chapter V introduces provisions that specify, among others, criteria to determine when there is an exceptional need to use data (e.g., in case of a public emergency),[138] the requirements and obligations that must be observed when public sector actors request access to data,[139] the rules for compensation for the use of the data[140] and the possibility that public sector actors have to share the data received with research organizations or statistical bodies.[141]



*Conclusions from the analysis of the Data Act Proposal*

Regarding the issue discussed in point 5.3.1. of this chapter, concerning the legal meaning of 'holding data', even though a legal definition of 'data holder' is introduced in the Data Act Proposal, the exact legal scope of 'holding data' remains vague, even more than in the Data Governance Act. This is the case because 'data holder' is defined in the proposed Data Act as someone who has the right or obligation under EU or national law, or, in the case of non-personal data, the ability ("through control of the technical design of the product and related services") to make certain data available,[142] thereby introducing an element of factual control. Hence, the Data Act does not help to clarify the legal meaning of 'holding data', the criterion used in EU law and policy to determine if data are to be considered from the public or the private sector.

Regarding the shortcomings related to the reluctance of regulating the sharing of privately held data observed earlier in this chapter, the Data Act Proposal does evidence a change in regulatory approach that must be acknowledged. The Data Act

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[137] Article 2(9), Data Act Proposal: "'public sector body' means national, regional or local authorities of the Member States and bodies governed by public law of the Member States, or associations formed by one or more such authorities or one or more such bodies".

[138] See Article 15 of the Data Act Proposal.

[139] Articles 17 and 19 of the Data Act Proposal.

[140] Article 20 of the Data Act Proposal.

[141] Article 21 of the Data Act Proposal.

[142] (Article 2(6), Data Act Proposal).

Proposal signals that there is more openness to regulate the sharing of private sector data for innovation purposes in the EU. This is illustrated by the introduction of horizontal (rather than sector-specific) rules mandating access to data generated by the use of a product or a related service, as well as the introduction of provisions to limit contractual freedom in the case of data sharing agreements following data sharing obligations under EU or national law (but not applicable to voluntary data sharing agreements). As acknowledged in its explanatory memorandum, the proposed Data Act intends to create a baseline horizontal framework for the sharing of private sector data, which will have to be taken into account when developing or updating sectoral data sharing regimes.[143]

The introduction of a regime for Business-to-Government data sharing in the proposed Data Act also confirms that the European Commission seems less reluctant to regulate the sharing of privately held data. However, this regime is not aimed at fostering innovation and economic growth (the focus of this chapter), but at supporting the execution of public tasks in cases of exceptional need.

### 5.6.3. The proposal for a Regulation on the European Health Data Space

Earlier in this chapter, a reference was made to the common European Data Spaces as an interesting development to follow up on, because they would pool public and private sector data to be shared within and across strategic sectors (see section 5.4.1.4.). After the publication of the article replicated in this chapter, the European Commission has put forward a proposal for an EU Regulation on the European Health Data Space (hereinafter 'EHDS Regulation Proposal') in May 2022.[144]

The proposed EHDS Regulation includes measures that are interesting vis-à-vis the topic investigated in this chapter. Chapter IV of the proposal lays down provisions that require data holders from *both* the public and private sector to make available certain categories of electronic health data[145] for secondary use. This obligation is enshrined in Article 33 of the proposed Regulation, which also specifies the categories of electronic health data that fall under the envisioned data sharing regime.

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[143] Data Act Proposal, Explanatory Memorandum, 4.

[144] European Commission, 'Proposal for a Regulation of the European Parliament and of the Council on the European Health Data Space, COM(2022) 197 Final' (2022) <https://eur-lex.europa.eu/resource.html?uri=cellar:dbfd8974-cb79-11ec-b6f4-01aa75ed71a1.0001.02/DOC_1&format=PDF> accessed 7 July 2022.

[145] For the definition of 'electronic health data', see Article 2, par. 2, literals a), b) and c) of the EHDS Regulation Proposal.

'Secondary use' refers to the use of electronic health data for the purposes specified in Article 34 of the proposed Regulation.[146] These include activities pursued by public authorities (e.g., to support public authorities to carry out their legal tasks, to produce official statistics), scientific research and innovation purposes. The latter refers to the provision of personalized healthcare, as well as the development of products or services and the training, testing and evaluation of algorithms, Artificial Intelligence systems and digital health applications, which contribute to public health, social security, or the safety and quality of healthcare services, medicinal products or medical devices.[147]

The proposed EHDS Regulation is interesting for the subject of this chapter because it intends to create a framework for the sharing of health data for secondary uses (including innovation purposes pursued by businesses) that applies regardless of the public or private nature of the data holder.[148] This approach aligns with some of the ideas put forward earlier in this chapter, where it was suggested that to overcome the limitations of the public-private data dichotomy, data sharing regulation should focus less on the nature of the data holder and more on the context in which data are produced and/or the socioeconomic value of the data. In this sense, the proposed EHDS Regulation shows a more flexible approach compared to the public-private data dichotomy evidenced in the legal frameworks and policy documents available when the research presented in this chapter was carried out.

However, it cannot be assumed that the approach followed in the EHDS Regulation will become the default way to regulate data sharing in the EU. The proposed Regulation is, after all, a regulatory instrument created for and taking into account the specificities of the health care sector. In particular, the COVID-19 pandemic is a very important contextual factor that underlies and justifies the reach of the proposed measures, as repeatedly acknowledged by the EHDS Regulation Proposal itself. Other sectors or other types of data might not be subject to similarly pressing factors that justify the creation of data sharing obligations for privately held data.

[146] Article 2, par. 2, literal e) of the EHDS Regulation Proposal.

[147] Article 34, par. 1, literals f), g) and h), and Recital 41 of the EHDS Regulation Proposal.

[148] In this regard, see the definition of 'data holder' in Article 2, par. 2, literal y) of the EHDS Regulation Proposal, which does not make a distinction between public and private data holders. See also Recital 40, which states that "data holders can be public, non for profit or private health or care providers, public, non for profit and private organisations, associations or other entities, public and private entities that carry out research with regards to the health sector that process the categories of health and health related data mentioned above". The same recital specifies that micro-enterprises are "excluded from the obligation to make their data available for secondary use in the framework of EHDS".

### 5.6.4. Concluding remarks from the update on recent legal developments

The most important observation from this update is that the proposed Data Act and EHDS Regulation show a recent change in attitude of the European Commission vis-à-vis the regulation of data sharing in the EU. The two analyzed proposals show that there is gradually more openness to regulate the sharing of privately held data for the purposes of innovation and economic growth, compared to the time in which the original research presented in this chapter was carried out.

The change in approach evidenced in the two proposals is a first step towards more flexible regulation of data sharing, beyond the rigidness of the public-private data dichotomy criticized in this chapter. This development is to be welcomed, but there is still a long way to address the problems raised in this chapter. Firstly, it remains to be seen whether the final texts of the Data Act and EHDS Regulation (after the legislative procedure) will maintain the same approach of the Commission's proposals. Secondly, even if this is the case, it cannot be taken for granted that this approach will be extended to future data sharing legislation, for instance, to regulate other Data Spaces or when revising the Open Data Directive.

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# CHAPTER 6

# Conclusions

# 6.1. Findings of the research

This thesis set out to address the question: **what are the regulatory challenges of data-driven innovation and data sharing in the context of the digitalized utilities, and what are possible ways to deal with these challenges?**

The four studies presented in Chapters 2 to 5 dealt with different elements of this question. The following sections summarize the main findings of this research, grouped according to the lines of inquiry identified in the introduction to this dissertation (Chapter 1). The first section will focus on the challenges arising from data-driven innovation[1] in the management of infrastructures in the digitalized utilities. The second section refers to the challenges related to the regulation of data sharing[2], as evidenced by the analysis of the legal and policy frameworks applicable to the sharing of data from the utilities sector.

## 6.1.1. The regulatory challenges created by data-driven innovation in the digitalized utilities

*Digitalization as an enabler of data-driven innovation in the utilities sector*

Digitalization consists in the implementation of information telecommunication technologies in the management of infrastructures in sectors such as drinking water and electricity. This allows for more frequent and near-to real-time collection of data, at different points of the infrastructures including the homes of the consumers (e.g., with smart meters). Thereby, more data becomes available about the infrastructures and the use of the utilities.

As discussed in Chapters 2 and 3, digitalization allows infrastructure managers to become data-driven and offers opportunities in different fronts, such as improving the design, monitoring and maintenance of infrastructures, and offering a better service to the consumers. At the same time, as will be explained below, the new possibilities of action give rise to a number of regulatory challenges, both for policymakers and infrastructure managers.

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[1] Data-driven innovation meaning the "significant improvement of existing, or the development of new, products, processes, organizational methods and markets" made possible through the analysis of large volumes of data, OECD, 'Data-Driven Innovation: Big Data for Growth and Well-Being' (OECD Publishing 2015) 17 <https://doi.org/10.1787/9789264229358-en>.

[2] 'Data sharing' is understood in this dissertation as making data held by one or more organization(s) (the data holder(s)) available for re-use by other parties outside that organization (data re-users); where re-use can be understood as the use of data for commercial or non-commercial purposes other than the initial purpose for which data were produced. For the origins of this definition, see Chapter 5.

*Challenges for infrastructure managers*

As a consequence of digitalization, besides being responsible for the physical assets in their sector, infrastructure managers are also becoming data managers. This has two important implications. Firstly, that in addition to the regulations laying down their traditional tasks in their respective sectors (drinking water and electricity), infrastructure managers must observe additional legal frameworks when using data, including data protection, privacy and cybersecurity legislation, as explained in Chapters 2 and 3. While data-driven innovation can assist infrastructure managers in performing their regulatory tasks and realizing public values such as safety, reliability, and affordability, processing large amounts of data comes with additional responsibilities and requires that infrastructure managers consider additional interests beyond the increased efficiency that data-driven innovation may offer.

For example, as examined in Chapters 2 and 3, although smart metering technology makes it possible to obtain very granular data that can be useful for infrastructure managers, the collection of data through devices installed at the homes of the consumers has implications for their rights to privacy and protection of personal data. In that sense, when collecting data with technologies such as smart meters, infrastructure managers must ensure that the collection of data will not be unnecessarily intrusive for the consumers, that the collected personal data will be used for lawful and specific purposes, that a legitimate ground for personal data processing can be invoked, among others. In addition, as examined in Chapter 4, the fact that infrastructure managers rely on personal data for the fulfilment of their tasks, entails that they will fall under the supervision of one additional authority, namely, the data protection authority.

Secondly, next to the role of keeping infrastructures up and running, infrastructure managers in the utilities sector are becoming important actors of the data economy. Infrastructure managers hold data regarding the condition and use of their physical networks, as well as consumption data, which can be re-used by other actors in the same sector and beyond, to provide services and develop innovative products. The potential of re-using data collected in the utilities sector for innovative purposes has been acknowledged by EU policymakers, which have put forward measures to improve access to and reuse of these data. This is illustrated by the Recast Electricity Directive and the Open Data Directive (analyzed in Chapters 4 and 5, respectively), which introduced data sharing obligations and/or specific conditions that must be applied when sharing data from the utilities sector. These legal frameworks are relevant for infrastructure managers. In the case of the Recast Electricity Directive, this is so because the distribution system operators (DSOs) are usually involved in

the management and exchange of data in that sector. In the case of the Open Data Directive, the relevance stems from the fact that infrastructure managers are often public sector bodies or public undertakings.

Hence, next to their obligations to operate and keep physical assets in good condition, infrastructure managers also have an important role in the data economy as holders of data from strategic sectors. Namely, they must make data available for re-use following the legal and technical requirements laid down by law. Against this background, in addition to complying with the sectoral regulations that govern the tasks of infrastructure managers, they will also have to comply with the requirements coming from data sharing legislation.

In conclusion, the new role of infrastructure managers as data managers brings along **the challenge of navigating and complying with the (more general) legal frameworks that regulate how data should be used and shared**, simultaneously with the sector-specific market regulation that governs their primary tasks.

*Challenges for policymakers*

Chapters 2 and 3 discussed the importance of regulation and public policies vis-a-vis digitalization in the utilities sector, concretely in the drinking water sector. Regulation can directly or indirectly stimulate or hinder the uptake of digitalization and determines the leeway that infrastructure managers have to become data-driven. In addition, regulation can steer data-driven innovation in a way that benefits are maximized, and risks are avoided or mitigated.

One of the key questions investigated in this dissertation was whether the regulatory frameworks governing the utilities sector are still fit for purpose, in light of the changing sociotechnical landscape resulting from digitalization and data-driven innovation. This question was investigated in Chapter 3 of this thesis, which examined whether the rollout of smart water meters in the Netherlands requires changes in the existing regulatory framework of the Dutch drinking water sector.

That study found that the existing regulation of the Dutch drinking water sector does not deal with the opportunities and risks brought by more granular data being collected with smart water meters. This reveals a 'regulatory gap', as explained by the literature on law and technology studied in Chapter 3. Existing regulatory frameworks in the Netherlands do not reflect, for instance, that metering data can be used not only to determine the consumption and bill the consumer, but also for other purposes, such as pinpointing leakages and other disruptions in the infrastructures.

At the same time (as explained in Chapters 2 and 3), those additional purposes require more granular data being collected with smart meters installed at the homes of consumers. Smart meter data give insights into private and family life and qualify as personal data to the extent that they relate to identifiable natural persons. In the analysis presented in Chapter 3, it was found that the regulatory framework of the Dutch drinking water sector does not yet consider the impact on the rights to privacy and personal data protection that smart water meters introduce as a result of more frequent measurements of water consumption.

Chapter 3 concluded that, if smart water meters are to be rolled out in the Netherlands, it would be desirable to review and update the regulation of the drinking water sector to reflect the new possibilities of action enabled by this technology. Concretely, this would entail adjustments to the current rules applicable to the metering activity, but also to the broader system of rules of the sector, including, among others: specifying the policy objectives to be attained with the rollout of smart meters, providing guidance to balance such objectives against the protection of privacy and personal data of the consumers, and assessing whether the current regulatory instruments (tariff regulation, investment plans and performance comparison) offer enough room for drinking water companies to invest in digitalization.



Against this background, the analysis in Chapter 3 points at one important challenge faced by policymakers in the utilities sector. Namely, **the challenge of dealing with the opportunities and risks brought by the growing use of digital technologies and processing of (personal) data in the utilities sector.** As argued in Chapter 3, when regulating the digitalized utilities, policymakers must find a balance between allowing infrastructure managers to take advantage from data driven innovation, and protecting other interests, such as the rights to privacy and personal data protection of consumers.

### 6.1.2. The challenges of regulating data sharing in the EU: insights from the utilities sector

As noted in the introduction to this thesis, as well as in Chapters 4 and 5, there is a growing interest to regulate how data are used and shared in the EU, with the aim of fostering the data economy and creating a single market for data. To this end, multiple legal frameworks governing data (sharing) have been adopted in recent years in the EU.

This thesis studied the legal frameworks applicable to data sharing, from the perspective of data held by infrastructure managers in the utilities sector (Chapters 4

and 5). Adopting this perspective, allowed to identify and inquire into two distinctive features of how data sharing is regulated in the EU and reflect on the challenges thereof. Firstly, the coexistence of horizontal and sectoral frameworks that apply to data sharing, and secondly, the existence of differentiated regimes for data sharing depending on the public or private nature of data holders and re-users.

*The challenges of regulating data sharing with intersecting horizontal and sectoral legal frameworks*

The first characteristic of the regulation of data sharing in the EU is that it mixes horizontal and sectoral legal instruments. Part of the rules applicable to data sharing are enshrined in EU legislation that have data as main regulatory object, and that were or will be adopted with the aim of enabling a single market for data in the EU. This is the case of legislation such as the recently adopted Data Governance Act, the proposed Data Act and the GDPR (in the latter case combined with the objective of protecting personal data). On the other hand, regimes for data sharing are being introduced in sectoral legislation in sectors such as electricity, payment services or the automotive industry. Such data sharing regimes are primarily intended to attain certain policy objectives within the respective sector, but indirectly contribute to the broader aims of the data economy.

Both types of legal frameworks may intersect, for example, in cases in which the sectoral data sharing regimes entail the processing of personal data, triggering the application of the GDPR. In such scenario, horizontal and sectoral legal frameworks, which have different policy objectives, levels of implementation and supervisory authorities, must be applied simultaneously. This may give rise to legal uncertainty and tensions, because the current EU legal frameworks do not provide sufficient mechanisms for substantive alignment and cooperation between different supervisory authorities.

The latter challenge was explored in Chapter 4, which examined the intersection between the GDPR and the rules for access to consumer data in the electricity sector given by the Recast Electricity Directive adopted in 2019. As explained in Chapter 4, one of the goals of the review that resulted in the Recast Electricity Directive was to enhance access to consumer data while ensuring a high level of data protection. However, after examining the provisions on access to consumer data in the Recast Electricity Directive, this dissertation concluded that the result was more modest. Although the Directive acknowledges explicitly that the GDPR shall be applied whenever personal data are shared or otherwise processed in the electricity sector, little guidance is offered on how to apply both frameworks simultaneously to ensure

a high level of data protection. Hence, as observed in Chapter 4, Member States are the ones responsible to ensure the alignment between the GDPR and the data access rules adopted in transposition of the Recast Electricity Directive.

Chapter 4 made the argument that the above requires that Member States (legislators or other designated competent authorities) should go beyond making an explicit reference to the applicability of the GDPR in the national rules for access to consumer data. The mere reference to the applicability of the GDPR does not clarify how to deal with the entwinement of the roles, rights and obligations that occurs when applying both legal regimes. It does not clarify either how to go about possible overlaps between the competences of the supervisory authorities of each regime (data protection authorities and energy regulators).



The argument follows from the analysis of a case from the Dutch electricity market (the Personalized Offer case), which showed that the alignment between the GDPR (as a horizontal framework for the processing of personal data) and the sectoral rules for access to data in the electricity sector cannot be taken for granted.

Two main lessons were drawn from the analysis of the Personalized Offer case in Chapter 4. As the *first lesson*, it was submitted that Member States (concretely, legislators or competent authorities designated to regulate data sharing) should be proactive and take steps to enhance the substantive alignment of the GDPR and the sectoral rules for access to consumer data. As observed in the Personalized Offer case analyzed in Chapter 4, uncertainty regarding whether and under which conditions consumer data can be shared in compliance with the GDPR, might end up hindering data sharing in the electricity market, or lead to discriminatory access to such data.

Two suggestions to improve the substantive alignment of the two legal frameworks analyzed in Chapter 4 were put forward. On the one hand, resorting to the possibility that the GDPR gives to Member States to lay down rules for specific processing situations, specifying (among others) conditions under which the processing of personal data is lawful.[3] On the other hand, requiring parties responsible for data management (e.g., Distribution System Operators) to draw up codes of conduct in which they specify the application of the GDPR in the context of access to consumer data, to contribute to the transparent and non-discriminatory access to data, as required by the Recast Electricity Directive.

[3] Recital 10, GDPR.

The *second lesson* refers to institutional aspects and highlights the need to strengthen cooperation mechanisms between personal data protection authorities and energy regulators. As discussed in Chapter 4, since both authorities are competent to oversee access to consumer data from their respective regulatory fields, the powers of data protection authorities and energy regulators are likely to come in contact or overlap with each other.

It was then argued that the consistent application of the GDPR and the rules for access to consumer data in the electricity sector can benefit from cooperation between data protection authorities and energy regulators, to complement each other's expertise and, where appropriate, take joint enforcement actions. As discussed in Chapter 4, the GDPR and the Recast Electricity Directive do not provide clear cooperation mechanisms for these authorities. It was recommended that initiatives that aim at enhancing cooperation between supervisory authorities that are competent to oversee digital markets (data protection authorities, national competition authorities and/or consumer protection authorities) are used as a reference to develop cooperation mechanisms between data protection authorities and energy regulators. National legislators can lay down the legal basis and general objectives of such cooperation, and the supervisory authorities can develop the specific arrangements to materialize it.

The main conclusion to be drawn from Chapter 4 vis-à-vis the current regulatory approach to data sharing in the EU, is that the coexistence of horizontal and sectoral legal frameworks brings in **the challenges of ensuring substantive alignment and cooperation between multiple competent authorities.** These challenges will become more pressing with the proliferation of legislation governing data, such as the recently adopted Data Governance Act, the future Data Act, and possible regulations for the European Data Spaces. The regulatory landscape for data sharing is becoming every time more complex, and it will be likely that more than two legal frameworks must be applied at the same time. As noted in Chapter 4 of this thesis, dealing with these challenges requires much more than introducing a reference to the applicability of other legal frameworks.

*The challenges of regulating data sharing beyond the 'public-private sector data dichotomy'*

The second distinctive characteristic of the regulation of data sharing in the EU observed from the analysis of legal sources performed for this research, is that it is structured around two main dichotomies: the distinction between personal and non-personal data, and the distinction between public sector and private sector data. While other scholars have already investigated the shortcomings of the first

dichotomy, research on the second dichotomy was lacking. The study presented in Chapter 5 of this thesis contributes to filling that gap, by inquiring into the diametrically different approaches followed in the EU to regulate public sector and private sector data sharing for the purposes of innovation and economic growth.

To this end, Chapter 5 examined legal and policy frameworks applicable to two categories of data sharing as identified by the European Commission: Government-to-Business (G2B) data sharing and Business-to-Business (B2B) data sharing. From the analysis of the abovementioned frameworks, it was observed that the main criterion to assert which data sharing regime applies in a given case, is the public or private nature of the data holder. Moreover, it was found that the regulatory approaches for G2B and B2B were very different: G2B data sharing is much more regulated, harmonizing public sector data re-use across the EU, to the benefit of a broad and undetermined range of re-users. In contrast, B2B data sharing as a general rule is left to contractual freedom, and regulatory intervention mandating data sharing and standardizing its conditions is usually exceptional and sector specific. In addition, in the B2B context, the beneficiaries of data sharing are a selected number of re-users, chosen voluntarily by the data holder or mandatorily by the policymakers.

As discussed in Chapter 5, although the public-private data dichotomy might be useful to give structure to the lines of action of the European Commission, it does not accurately reflect the complexity and changing dynamics of data production. Two types of shortcomings of this dichotomy were identified. On the one hand, it was argued that the distinction is challenging to apply because the legal meaning of 'holding data' remains vague, and because more often than not, actors from both the public and private sector contribute to the creation of data (e.g., in the context of smart cities). On the other hand, it was argued that the public-private data dichotomy visible in the law and policy for data sharing in the EU, does not fully reflect the growing role of the private sector in the production of data with high socioeconomic value and potential for re-use. As explained in Chapter 5, private actors increasingly intervene in the 'public sphere' as a result of delegation, privatization or *de facto* (through the mass engagement of people with their platforms or services), and might soon outrival the public sector as major holders of datasets with high socioeconomic value.

In this regard, two main points of critique were made in Chapter 5 in respect of the approach followed to regulate data sharing in the legal and policy frameworks analyzed in that study. Firstly, that too much emphasis is placed on the public or private nature of the data holder, and too little importance is given to factors such

as the context in which data were collected, or the value of data for the economy and society. Secondly, that although the private sector has a prominent role in the generation of data of high socioeconomic value, EU policymakers are generally reluctant to regulate the sharing of private sector data for innovation purposes beyond exceptional sector-specific intervention.

Against this background, the main challenge studied in Chapter 5 is the **challenge of finding ways to regulate data sharing going beyond the traditional distinction between public and private sector data,** which is becoming contested under current dynamics of data production. As argued in Chapter 5, data sharing regulation should focus less on the public or private nature of the data holder and more on the context in which data are produced or their potential for re-use. It was also argued that data sharing regulation should acknowledge the increasing involvement of the private sector in the production of data, breaking with the assumption that only data that have been obtained with 'taxpayers money' should be widely available for re-use.

With this in mind, Chapter 5 suggested concrete starting points to move forward the discussion on regulating data sharing beyond the limitations of the public-private data dichotomy. The suggestions included expanding the scope of the Open Data Directive in the next review of this legislation (to cover data held by private undertakings active in the provision of services of general interest), as well as examining whether and under which circumstances private sector data should be subject to a regime that facilitates re-use by actors in multiple sectors, even if the data holders do not formally perform a public task or a service of general interest.

The article mirrored in Chapter 5 was published in June 2021, when not much was known about the legislative measures announced by the European Commission in the 2020 Data Strategy. In this dissertation, an update on legal developments after the publication of the article was added at the end of Chapter 5. From that update, the two most interesting developments for the public-private data dichotomy studied that chapter are the publication of two legislative proposals in 2022: one for a Data Act[4] and one for a Regulation on the European Health Data Space.[5]

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[4] European Commission, 'Proposal for a Regulation of the European Parliament and of the Council on Harmonised Rules on Fair Access to and Use of Data (Data Act) COM(2022) 68 Final.' (2022) <https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:52022PC0068&from=EN> accessed 7 July 2022.

[5] European Commission, 'Proposal for a Regulation of the European Parliament and of the Council on the European Health Data Space, COM(2022) 197 Final' (2022) <https://eur-lex.europa.eu/resource.html?uri=cellar:dbfd8974-cb79-11ec-b6f4-01aa75ed71a1.0001.02/DOC_1&format=PDF> accessed 7 July 2022.

In Chapter 5 (section 5.2.3.) it was initially observed that the regulatory approach for B2B data sharing in the EU as a general rule favors contractual freedom and that "EU policymakers are rather reluctant to introduce horizontal rules for the sharing of private sector data".

After analyzing the proposed Data Act and the proposed Regulation on the European Health Data Space, it was concluded that there is a change in approach that should not go unnoticed. There is gradually more openness (at least from the side of European Commission) to regulate the sharing of private sector data for the purposes of innovation and growth in the EU. This development is welcomed, because it is a first step towards regulation of data sharing that goes beyond the rigidness and the shortcomings of the dichotomy studied in Chapter 5.

The question remains whether the EU co-legislators will maintain the same approach, and whether the Commission itself will continue on this path, for instance, when proposing the rules for other common European Data Spaces, or when revising the Open Data Directive. As a result, the challenges identified in Chapter 5 are likely to stay at the forefront of the attention in regulatory debates in the years to come.



## 6.2. Contributions to research

The research presented in this dissertation makes a significant contribution to two broad strands of literature, namely, economic regulation studies (in particular, to the subfield of network industries regulation) and law and technology studies (in particular, to the subfield of Data Law).

Firstly, this dissertation provides a comprehensive overview of technological developments and new data uses that are transforming the way in which infrastructure managers in the drinking water sector perform their regulated tasks, reflecting on the implications for both infrastructure managers and policymakers in that sector. Studies investigating the challenges brought by digitalization and data-driven innovation in the drinking water sector were lacking in legal scholarship and this dissertation contributes to fill this gap.

In addition, this dissertation offers a comprehensive overview and in-depth analysis of existing (and upcoming) EU and Dutch legal frameworks governing the tasks of infrastructure managers in the drinking water and electricity sectors, together with the legal frameworks applicable to the use and sharing of data collected in those

sectors. Moreover, this research analyzes how the different frameworks relate to each other and identifies challenges in the form of regulatory gaps, uncertainties and shortcomings, and presents suggestions to deal with them. In doing so, this research brings together two fields of study that are usually pursued separately in legal literature, namely, the regulation of network industries and the regulation of data.

Pursuing these two fields together has led to novel insights that go beyond existing literature. For example, one of the key points put forward in Chapter 4 is the need to strengthen cooperation mechanisms between data protection authorities and energy regulators. While extensive research has been done regarding the convergence of competences between data protection authorities, consumer protection authorities and national competition authorities, the convergence of the competences between data protection authorities and energy regulators analyzed in this dissertation is a topic that has remained largely unexplored in legal literature.

Moreover, this research has enriched existing debates on the regulation of data sharing by inquiring into what here has been named the 'public-private data dichotomy'. This dichotomy has thus far remained unstudied and unquestioned in legal scholarship. This dissertation has unpacked this dichotomy, analyzing what are its underlying assumptions and shortcomings, and proposing ideas for more comprehensive ways to regulating data sharing that go beyond the dichotomy's limitations. Particular attention was devoted in this thesis to breaking with the idea that only data from the public sector should be widely available for re-use, and the need to explore whether and under which conditions privately held data could also be subject to a regime that facilitates accessibility by a broad range of re-users.

## 6.3. Practical implications

The findings of this research have important implications for infrastructure managers, policymakers and national supervisory authorities.

### 6.3.1. For infrastructure managers

The studies presented in this dissertation focus predominantly on the drinking water and electricity sectors and, as such, the practical implications in this section are distilled having in mind the dynamics of those sectors. Nevertheless, some of the practical implications from this research can also be relevant for infrastructure managers in other network industries that are also becoming data driven. Bear

in mind that some aspects that play an important role in the drinking water and electricity sector (e.g., the strong reliance on consumers' personal data) might be less prominent for the managers of infrastructures such as roadways, ports and railways.

Infrastructure managers must be aware that becoming data-driven comes with additional responsibilities on top of their traditional tasks. It demands *ex ante* consideration of and demonstrating compliance with legal frameworks that govern how data should be used and shared. As shown in this dissertation, different (intersecting) legal frameworks need to be considered depending on the type of data, the actors involved and the relevant utility sector. Each of these frameworks requires that infrastructure managers adopt organizational and technical measures to ensure that data are collected, managed and shared following principles and obligations introduced by law to achieve multiple policy objectives (e.g., the protection of personal data, the protection of critical infrastructures, promoting innovation based on data re-use). This will require that infrastructure managers develop more expertise to navigate the more general data-related legal frameworks simultaneously with the sectoral rules that govern their main responsibilities concerning the functioning of the networks in the utilities sector.



### 6.3.2. For policymakers

National policymakers should examine whether current regulatory frameworks of the utilities sector are attuned with the possibilities of action enabled by the growing collection and analysis of data. Among others, policymakers should examine whether the new responsibilities of infrastructure managers as the managers of the data collected in the utilities sector are sufficiently clear, whether the interests of individuals (as consumers and data subjects) are sufficiently safeguarded, and whether current instruments of market supervision give enough space for infrastructure managers to use data-driven technologies and develop innovative ways to fulfil their legal tasks.

EU Policymakers should pay more attention to the interplay between the multiple legal frameworks that have been adopted and proposed to regulate data sharing, and between such frameworks and other data-related legislation (e.g., the GDPR). The network of legislation governing how data should be used and shared in the EU keeps growing and each legal instrument requires the appointment of an authority to monitor and enforce compliance. EU policymakers (and where appropriate, Member States) should ensure that there are clear mechanisms to deal with substantial overlaps between different legal frameworks and to enable cooperation between multiple supervisory authorities.

### 6.3.3. For national supervisory authorities

National supervisory authorities, namely, energy regulators and personal data protection authorities, should pay close attention to the convergence of their competences resulting from the intersection between the GDPR and the national rules for access to consumer data adopted by each Member State in transposition of the Recast Electricity Directive. Clear cooperation mechanisms between the two types of authorities can contribute to a consistent application of both legal regimes, and to determine when joint action might be desirable.

## 6.4. Directions for further research

This section suggests directions for further research, sparked from the study of the sectors and legal frameworks presented in this thesis.

In this dissertation, existing and upcoming legal frameworks were analyzed with the aim of pinpointing gaps and uncertainties and suggesting alternatives for improvement, focusing predominantly on the substance of the legal rules. An interesting avenue for further research would be to examine what kinds of law-making techniques are currently being employed to regulate data, their strengths, shortcomings and opportunities for improvement.

In this thesis it was discussed how the coexistence of multiple legal frameworks for data sharing leads to possible overlaps or concurrence of competences between two different supervisory authorities (data protection authorities and energy regulators). The acquis applicable to data (sharing) in the EU is growing and each new legislation requires the appointment of one or more (new) authorities to supervise and enforce their provisions, as visible for example in the Data Governance Act, the proposed Data Act and the proposed Regulation on the European Health Data Space. It would be interesting to investigate whether this will lead to more overlap of competences between already existing and new supervisory authorities, and if so, how will it be ensured that there is cooperation between those authorities.

The studies carried out for this research investigated the regulatory challenges of data-driven innovation and data sharing in the drinking water sector and the electricity sector, focusing on one sector at the time. Digitalization in these and other sectors (e.g., transport) offers opportunities for cross-sectoral collaboration, by means of data sharing or taking advantage of interdependencies between different sectors (e.g., water-energy nexus, energy-mobility nexus). However, the regulation of

network industries is usually siloed. In this regard, it would be relevant to investigate which complementary or alternative approaches to regulate network industries are needed to favor collaboration across different sectors.

Lastly, this dissertation analyzed the regulatory challenges arising from the increased data collection made possible through established technologies such as smart meters. Further research is needed to understand and address the regulatory challenges arising from more complex technologies being used to analyze data from the digitalized utilities, which bring their own regulatory and ethical challenges. For example, advances in Artificial Intelligence in the electricity sector can help distribution system operators to improve the accuracy of load forecasting, simplifying or automating the management of flexibility assets and enable a highly automated electricity market.[6] At the same time, the use of Artificial Intelligence systems in the electricity sector raises legal and ethical challenges related to fairness, transparency, responsibility and energy justice that ought to be investigated.



## 6.5. Concluding thoughts

Dealing with data in the digitalized utilities is a challenging undertaking for policymakers, supervisory authorities, and infrastructure managers. As shown in this dissertation, dealing with data requires balancing multiple (and sometimes competing) interests, rights, and policy objectives. It also involves grappling with the fact that data blur the boundaries between regulatory domains and bring traditional distinctions between public and private under pressure.

This research offers insights to better understand and address the range of regulatory challenges that result from the growing use and sharing of data in the utilities sector, whose digital transformation will continue to be high on the agenda in academic, policy and societal debates in the next years.

[6] Irene Niet, Rinie van Est and Frank Veraart, 'Governing AI in Electricity Systems: Reflections on the EU Artificial Intelligence Bill' (2021) 4 Frontiers in Artificial Intelligence 3 <https://www.frontiersin.org/articles/10.3389/frai.2021.690237> accessed 13 July 2022.

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