Governing the “good” citizen and shaping the “model” city to tackle climate change: materiality, economic discourse and exemplarity.

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Abstract:

Purpose: Cities are key actors in the fight against climate change. They have developed integrated strategies harnessing the power of information and communication technologies (ICT), as part of the move towards smart(er) cities. Despite our knowledge of the role of technological infrastructure in tackling climate change, the role of governance mechanisms to actively pursue environmental sustainability is often understated. Therefore, this research analyses governmentality mechanisms developed by a small town in Europe to render energy savings and new energy sources visible and create new identities with which the citizen and other cities could then identify with, thereby participating in the fight against climate change.

Findings: The outcome of these governmentality mechanisms was to create two new identities: the "good citizen", responsible to lower his impact on climate change, and the "model city" – a laboratory that would serve as a guide for future policies to tackle climate change at the city level. While the "model city" was successful and identification happened with other small cities taking example on it, the "good citizen" failed and inhabitants did not identify with this role model that was defined for them as a way to participate in the fight against climate change.

Research design: Data was gathered through non-participant observation, interviews and access to internal data from the city's energy control project.

Social implications: This paper has implications for how climate change can be tackled in rural areas by small cities. While the role of organizations and large cities (e.g. C40 city network) has been acknowledged, there is a possibility for smaller local actors to act upon grand challenges with local strategies and their own governmentality mechanisms.

Practical implications: This case study is a concrete example, based on a longitudinal study, of a city's strategy and actions on climate change. Other small cities will be able to use this case study to gauge their possibilities for action on climate change. Notably it is an example of how a network of mechanisms can achieve results in CO_2 emissions reduction. It also demonstrates the difficulty to enrol citizens into an environmental sustainability scheme.

Originality: The case study contributes to the literature on cities, bringing new insights on how they can become actors of climate change beyond acting on internal controls, and the literature on governmentality by demonstrating how mechanisms can act upon a population without being calculative.

Keywords : Smart cities, governmentality, climate change, environmental sustainability, materiality, public management

Introduction

Cities will be key to survival on the planet. By 2050, 70% of the world population will be living in cities, and urban living already represents 80% of world CO_2 emissions, and 75% of energy consumption (Baudet and Landrin, 2012). Climate change represents a serious threat to future economic growth and societal well being of many cities (Whiteman *et al.*, 2011). Indeed, cities are vulnerable to impact of climate change, such as for example extreme events, changing biodiversity or potential health impacts (Whiteman *et al.*, 2011). We must therefore rethink our ways to live, move and feed ourselves (Baudet and Landrin, 2012).

Global climate change stabilization depends on how cities will elaborate strategies and governance regimes to lower their greenhouse gases (GHG) emissions, and in turn this will further address other major socio-ecological problems such as pollution, decreasing biodiversity and human well-being (Whiteman *et al.*, 2011). Therefore, this paper takes as its starting point that cities have a critical role to play in setting the direction or aspirations with regard to targeting climate change (Ball *et al.*, 2009; Cooper and Pearce, 2011). Despite growing research into how cities engage with the sustainable development agenda, little is known about how cities tackle the climate change grand challenge (Ball *et al.*, 2009).

Actions undertaken by cities to reduce GHG emissions are not only technical but also include social processes, that is "the ways humans make choices, their willingness to seek out new connections, to invent new combinations, to explore the possibilities of the world around us" (Cohen-Rosenthal, 2000, p. 250). Therefore, there is a need to move beyond the technical development towards climate change mitigation and adaptation to better understand the societal choices that are made by the cities and within the cities to critically address our capacity to tackle climate change. The topic of climate change in cities is investigated through the lens of "smart cities" (Pierce *et al.*, 2017). A smart (sustainable) city can be defined as meeting the needs of its present inhabitants, without compromising the ability for other people or future generations to meet their needs, and thus will not exceed local or planetary environmental limitations, with the support of information and communication technologies (ICT) infrastructure (Höjer and Wangel, 2015). While looking at smart cities, Höjer and Wangel (2015) warn against getting caught up only in the technological challenges. Smart cities actually need an approach that also looks at actor-networks, governance and policy innovations. Moreover, the role of citizens (public participation) in such efforts remains poorly theorized and understudied (Sarzynski, 2015).

The city that was explored to analyze how climate change is approached and tackled by towns developed infrastructures (including ICT), linked that with everyday objects and governance mechanisms that are the object of this study. Indeed, a smart city strategy – albeit focused on tackling climate change, will depend on an effective governance regime to achieve meeting the needs of its present inhabitants and those of future generations (Frame and Bebbington, 2008).

Our paper therefore examines the ways in which a small city in Europe attempted to render climate change governable by acting on its citizens and as a role model for other cities and territories in Europe. Therefore, it contributes to understanding further the

transition path adopted by smart cities to tackle climate change (Frame and Bebbington, 2008).

Our research is based on a single longitudinal case study that illustrates how cities, in this case a small city, developed governance mechanisms in hope to concretely enact solutions to climate change. New visibilities were developed that in turn fuelled governmentality mechanisms and new knowledge that were expected to develop the "good citizen" and a "model city". While the city indeed developed a new identity for itself through its pilot program, it failed to embark citizens in transforming themselves into "good citizens".

The theoretical framework of "governmentality" developed by Dean (1999) is used to analyze the case study. This framework has been used in the past to determine the mechanisms used and the extent to which these support a sustainability agenda (Frame and Bebbington, 2008; Russell and Frame, 2013; Tregidga, 2013; Spence and Rinaldi, 2014). Dean's framework supports investigations of "how a range of technologies (including strategy formulation) are being created or mobilised around contemporary issues such as sustainable development" (Frame and Bebbington, 2008, p. 7; Gouldson and Bebbington, 2007).

Two main contributions are made to the literature. First the modes of governance used to prompt citizens to become "good citizens" in terms of energy consumption (and thereby acting on GHG emissions reduction) are analyzed. Those mechanisms make each one of us governable and subject to climate change norms that require that we all take our fair share of the burden – and reduce our impact on the planet. Thereby our case study makes a contribution to the literature on environmental sustainability governance in cities. Second, we contribute to the literature on governmentality by demonstrating how governance mechanisms do not have to call on calculative practices to be effective in creating new identities, but can appeal to mechanisms such as material elements, economic discourse and exemplarity. This opens up a different perspective on governmentality mechanisms and how they are enacted by cities to "govern" their citizens into being "responsible", "good", or "smart" citizens.

The remainder of the paper is organized into the following sections. Section 2 discusses the literature on reporting and accounting sustainability in cities. Section 3 reviews the theoretical framework of governmentality and its application in the case of sustainability and smart cities. Section 4 presents the research design. Section 5 discusses the new visibilities, the governmentality mechanisms developed and the knowledge created, as well as the identities formed as a consequence. Section 6 discusses the findings and is followed by a conclusion.

2. Reporting and accounting sustainability in cities

Internationally, the public sector accounts for some 40 per cent of all economic activity (Ball and Grubnic, 2007). Cities, as public sector organizations, exist to deliver "public policy, and have social value base and purpose" (Ball and Grubnic, 2007, p. 243) and "local governments will be a determining factor in sustainable development" (Qian and al., 2011, p.94). The public sector has a far greater responsibility (a civic responsibility) than the private sector to deliver on tangible policies and programmes (GRI, 2005), thereby giving substance to the idea of living sustainably (Ball and Grubnic, 2007). Therefore, the authors

posit that sustainable development is radical political concept that requires the inclusion of ecological thresholds and to understand how to live within the limits of natural systems (Ball and Grubnic, 2007). It is important to examine whether public sector organizations actually work on easy to manage environmental issues such as recycling, waste management, or develop programs that tackled "environmental matters which challenge basic values and assumption", such as climate change (Burritt and Welch, 1997a, p. 7).

2.2 Reporting for the sustainability of cities

However, how public sector organizations will effectively discharge their responsibilities for sustainable development performance and what accounting techniques will they use to guide their actions remains an underdeveloped research agenda (Ball, 2002; Ball and Bebbington, 2008). Sustainability accounting and accountability in the public sector has been developed in the form of reporting (Bellringer *et al.*, 2011; Farneti and Siboni, 2011). Disclosures are seen as "the key to developing a public sector organization sustainability accounting and accountability agenda" (Ball and Grubnic, 2007, p. 252). "As agents of citizens, governments are accountable for the authority they hold and are required to account for their decisions, activities and performance in detail" (Schneider *et al.*, 2014, p. 430) notably when it relates to sustainability.

On the other hand, sustainability reporting is often portrayed as magic, a tool simultaneously fostering better policymaking and citizen engagement (Niemann and Hoppe, 2018), despite critics that say that sustainability reports are merely "an outlet for "greenwashing" or a source of "managerialist" information" (Dumay *et al.*, 2010, p. 543) and that they "may reinforce business-as-usual and greater levels of unsustainability" (Milne and Gray 2013, p. 13). Indeed, sustainability reporting in the public sector is mainly seen as being management isomorphism, and used as a legitimacy tool (Greco *et al.*, 2012; Greco *et al.*, 2015) or a green-signalling tool to stakeholders by cities eager to attract attention and investments (Niemann and Hoppe, 2018). In order to progress beyond the critique of providing managerialist information through reporting (mainly based on GRI guidelines), public and third sector organizations need to rethink their approach to sustainability (Dumay *et al.*, 2010). Public sector organizations must change to reflect viewing sustainability from a business biased point of view "to viewing it from an eco-systems perspective, therefore moving away from the dominance of 'managerialist' practice and setting the standard for the manner in which all organizations disseminate information about their sustainability activities" (Dumay *et al*., 2010, p. 545). Moreover, using sustainability reporting as the only tool or as an autonomous tool for accountability risks not achieving goals set for sustainability within cities, and it needs to be complemented with further sustainability management control tools.

2.3 Sustainability management controls

Sustainability management controls include "the design and use of controls to formally and informally ensure that the behavior and decision of (…) employees are consistent with the organization's objectives and strategies" (Maas *et al*., 2017, p.242). Business organizations have gradually assimilated sustainability controls in more or less complete

packages with different orientations, whether basic, informal or advanced (Gond *et al.*, 2012; Crutzen *et al*., 2017).

The development of tangible measures to guide, encourage and legitimize sustainable development practice is a key for the uptake of sustainability accounting in public sector organizations (Ball and Grubnic, 2007). However, the public sector's uptake of sustainability management controls has been relatively weak. Literature has documented the uptake of sustainability indicators, some environmental cost accounting and more recently, internal controls for mobility (Qian *et al.*, 2011; Crutzen *et al.*, 2018). Gradually, however, as for business organizations, we observe the formation of more complete sustainability management control packages (Crutzen *et al.*, 2018).

For example, sustainability indicators have been development to support public transparency, and allow organizational and policy learning (Zeemering, 2018). Dilworth et al. (2011) and Greco et al. (2015) emphasizes the importance of stakeholder consultation in order to implement the right indicators to actually measure sustainability and impact of public policies and action. Holden (2008) demonstrates how indicators have played a role in creating very explicit and clear knowledge around the concept of sustainability, while at the same time generating conversations and thereby implicit knowledge as well. She furthered the analysis of the role that sustainability indicators play in public policy by describing how they can act as boundary objects that open up dialogue, information sharing and consensus-building opportunities (Holden, 2013). On the other side, Adams et al. (2014) found that ecological and social welfare indicators were being the least considered by public organizations reporting and recommended that mandatory sustainability reporting be implemented. Also, difficulties of measuring policies outcomes have been emphasized. To measure outcome, a chain of cause-effect relations between the policy and possible outcomes has to be established, and this is difficult due to intervening factors and long-term effects of sustainability policies (Hoppe and Coenen, 2011).

Moreover, full cost accounting has been a way for public sector organizations to demonstrate the environmental and cost effectiveness of more sustainable action plans. For example, Qian et al. (2011), while studying waste accounting in the public sector, demonstrated that full costs of landfill practices where often neglected, making it impossible to adopt waste management practices. However, since environmental management accounting can also drive lower costs, some organizations were driven into sustainable practices for conservative and cost leadership reasons (Qian *et al*., 2011).

More recently, the public sector developed "packages" of controls to tackle sustainability. For example, Crutzen et al. (2018) were able to analyse not only one control, but several ones (plans, simple dashboards, key performance indicators and measurement systems, administrative procedures and processes, awareness campaigns and some reward/compensation actions) and how they worked together in helping Belgian cities implement sustainability mobility programs.

Despite the acknowledgment of some development in both reporting and control for sustainability in cities, most controls are only tackling "internal housekeeping". The GRI public sector reporting guidelines (2005) states that there are three information types that are needed to support sustainability strategies within the public sector:

organizational performance (which means sustainability management control is in place and could be reported externally through a set of key performance indicators and a sustainability report, for example about the GHG emissions of city buildings), public policies (which are part of a sustainability strategy, and for which indicators could be GHG emissions for a public policy in place) and contextual issues (meaning for example the possibility to monitor GHG emissions at the jurisdiction level). Despite those guidelines, there is often just the first level of indicators that are internally monitored and externally reported. The GRI even states that only level 1 and 2 of reporting should be achieved, as it is "unrealistic to hold agencies accountable for achieving outcomes that are largely affected by forces outside the organization's control" (Pitts and Fernandez 2009, p. 403). Ball and Grubnic (2007) however argue that good housekeeping is not sufficient, and that sustainability accounting in the public sector should also be about policy and programmes for action on sustainability development. Therefore, we now turn to governmentality mechanisms for sustainable development. Governmentality mechanisms are put in place to allow governing policies and achieving programs at a jurisdiction level – for example, tackling climate change at the city level.

3. Governmentality and sustainability

We are interested in understanding how a municipality can "conduct", lead, direct or guide its inhabitants' behaviour to follow a prescribe set of norms, here in terms of environmental sustainability. Therefore, the governmentality framework designed by Dean (1999) is first described and then governmentality is applied to sustainability and smart cities to critically analyze what mechanisms it entails and what consequences it might have.

3.1 Dean's governmentality framework

Government entails "any attempt to shape with some degree of deliberation aspects of our behaviour according to a particular sets of norms and for a variety of ends" (Dean, 1999, p. 10). Therefore, governmentality structures the field of action of others (Aggeri, 2005). Specifically, Dean (1999) underlines that government is about deliberately directing human conduct, which is conceived as something that can be regulated, shaped and controlled. However, rather than being a mere mechanism of control, governmentality mechanisms should be understood as mechanisms of orchestration which sometimes requires domination, but most times works upon mechanisms of seduction and inducement (Castán Broto, 2017). Its practices are intentional and allow the deployment of strategies. It also presumes that the government use specific forms of knowledge to be able to shape what constitutes "good, virtuous, appropriate, responsible conduct" (Dean, 1999, p.12). Dean (1999) suggests that governmentality can be understood with three elements.

First, there is a problem identified that needs governing (Bebbington, 2004), in our case climate change, but it could be environmental pollution or sustainable development. According to Dean (1999, p.27), the key starting point of an analytics of government is the identification and examination of specific situations in which the activity of governing comes to be called into question". Identifying a problem raises the question of "what constitutes right conduct and 'right' behaviour and this would further require a diagnosis

of what, if anything, is wrong with current conduct and behaviour and who has a problem with the status quo" (Bebbington, 2004, p.15).

The second element is the utopian ideal towards which the governing activity is directed (Frame and Bebbington, 2008), which strengthens the problematisation of the issue identified. According to Dean (1999, p. 33), "government is a fundamentally utopian activity", as it is not only necessary but possible. It implies that it is possible to "re-form human beings", that we can "make things better" (Dean, 1999, p.33).

Governmentality focuses on "how" questions, that is it directs our attention to the practices of government (Dean, 1999). Therefore, the third element is composed of three regimes of practice: new visibilities created, new mechanisms deployed, and new knowledge created. Unearthing new visibilities is asking what kind of light illuminates certain objects and (re-)defined them, and also what is being obscured and hidden through the new practices of government.

Finally, governing operates through the forming of new identities that are consequently developed through the practices of those particular government mechanisms. The processes of government "control, incite or suppress actions by drawing a line between what is acceptable and what is unacceptable" (Vanolo, 2014). Those governing activities give rise to new identities such as the "good citizen" or the "model city" in our case. Frame and Bebbington (2008) for example analyzed governmentality mechanisms that gave rise to the construction of the responsible/irresponsible individual. However, the problem of government is less one of identity (creation) than that of the governed citizens identifying themselves to that identity.

INSERT TABLE 1 HERE

3.2 Governmentality and sustainability

This framework is useful for this research as "sustainability is often portrayed in terms of programmatic aspirations of reform" (Spence and Rinaldi, 2014, p.434). "The ways in which the environment is constructed as in crisis (for example the climate change crisis), how knowledge about it is formed, and who then is authorized to save it become important for understanding the ways that the truth about the environment is made, and how that truth is governed" (Rutherford, 2007, p.295). The discourse about earth limits (planet boundaries, the earth overshoot day) implies that it is manageable, and that the resources of earth can be rationalized, indexed, measured and assessed (Rutherford, 2007, p.298). This discourse creates the conditions for the production of regimes of governmentality.

By describing the analytics of government, it becomes possible to unbundle sustainability related strategies and to determine what kind of utopian ideal is being sought (Frame and Bebbington, 2008). The concept of governmentality is taken here as the art of government, which extends to included a wide range of control techniques (Frame and Bebbington, 2008). It is a mean to describe a process by which governing is performed and achieved, notably through the type of knowledge used and produced, as well as the mechanisms developed, and the visibilities and identities created as outcomes of the overall process. Governmental organizations engaged in a variety of "disciplinary efforts

to affect and direct mindsets and provide guidance about" sustainability or climate change (Vallentin and Murillo, 2011). Governmentality is a form power as conduct – the management of possibilities - and not as domination (Lemke, 2001). Governmentality "seeks to uncover and examine the often invisible rationality which is behind an assemblage of actions and mechanisms that are in place to govern certain actions" (Gouldson and Bebbington, 2007, p.12).

3.3 Governmentality and smart cities

Governmentality is a theoretical lens that is adapted to study sustainability in the public sector specifically (Frame and Bebbington, 2008; Rutherford, 2007). Notably, it has been used to deconstruct mechanisms that have built around the concept of "smart cities", with the argument that smart cities can be conceptualised as an instance of governmentality through environmental-behavioural control (Krivý, 2018). Vanolo (2014) demonstrates how the creation of rankings linked to this new phenomenon has enabled to reduce the specificities of the multiple urban dynamics in assessable and enumerable units that allowed comparing southern Italian cities with northern ones, implying that they were behind in pursuing the smart city model and implicitly suggesting they should become similar to the northern cities. The choice of classification indicators is a subtle disciplining technique that has consequences on distinguishing desirable policies from those that are less. The smart city discourse "produces a new responsibilisation of the city as concerns environmental protection", making the environment an urban problem (Vanolo, 2014, p. 893). Consequently, cities are constructed as morally responsible entities vis-a-vis environmental concerns. Imposing the smart city discourse can also " mask other perspectives such as the possibility to rethink the capitalist system in entirely different ways, or invent solutions to the crisis of effective citizenship" (Vanolo, 2014, p.893). Finally, the smart city discourse inevitably produces the "smart citizen", and marginalizes others that cannot adapt, whether technologically illiterate or poor (Vanolo, 2014).

Through the case of a small city which implemented a 13-year long climate change policy, the analysis of governmentality mechanisms to achieve environmental sustainability in smart cities is developed. The governmentality lens will allow us to critically deconstruct the mechanisms in place and what they achieve- or fail to achieve towards environmental sustainability.

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4. Research Design

Our research is based on a qualitative research on a single longitudinal case study. While research in public sector organizations' sustainability accounting has mostly focused on Australia (Burritt and Welch, 1997b; Adams *et al.*, 2014; Kaur and Lodhia, 2018), New Zealand (Schneider *et al.*, 2014; Dobbs and van Staden, 2016) and the United Kingdom (Ball, 2005; Weir, 2018), a new perspective is offered through several different features. First, it is one of the first case studies of a small European town outside of the United Kingdom (exceptions exist, for example Marcuccio and Steccolini, 2007; Nogueiro and Ramos, 2014). Secondly, we were able to access the organization's internal data and perform interviews to access the internal motivations and processes in developing governmentality mechanisms for climate change. On the other hand, previous studies had mainly concentrated on external reporting as a source of data.

4.1 Case Study

The case study is that of a small town, that can be considered as a "smart city", with a comprehensive energy savings project having started as early as 2001. Indeed, it has invested in all three dimensions that define a smart city (Nam and Pardo, 2011), that are technology and infrastructures, population (through education and engagement) and governance and policy, to the aim of generating sustainable development and responsible management of natural resources, and through allowing the institutions to "contribute with innovation and better service for citizens" and "strengthening the debates and political participation" (Trindade *et al.*, 2017 p.3). According to Borsekova et al. (2018), 67% of European urban inhabitants live in medium-sized cities, while just 9.6% are located in cities having more than five million inhabitants, warranting research into how smaller cities deal with climate change.

The case study is unique in the sense that it focuses on a small town of about 6500 people in Europe, while the literature has mainly described recent initiatives for smart cities in larger cities such as San Fransisco, Seoul, Vienna or Brisbane (Lee *et al.*, 2014; Pancholi *et al.*, 2015; Fernandez-Anez *et al.*, 2018), and for climate change in Rotterdam and Hamburg (Huang-Lachmann and Lovett, 2016). Although the focus on the development of ICT infrastructure might lead us to understand that being a "smart city" could be the preserve of global and large cities, mainly because of the financial investment needed to implement ICT solutions (Gauthier and Gilomen, 2016; Borsekova *et al.*, 2018), this case study shifts attention to how smaller towns could make use of this concept – the smart city – to provide their citizens with a city that would be "interconnected, sustainable, comfortable and attractive "(Trindade *et al.*, 2017). Indeed, neither research nor practice has yet understood the impact of a city's size on the "smartness" of the city (Borsekova *et al.*, 2018). The role of all cities, big and small, has been acknowledged in the literature as being important to tackle climate change, and therefore research is now warranted in smaller scale cities, to demonstrate how they develop strategies and mechanisms to take their fair share of the burden.

Moreover, this case study is interesting as it follows the process that unfolded for this city to develop environmental sustainability efforts that would encompass infrastructure, everyday objects, discourse and information technology. Indeed, climate change politics is deployed "as a means to organize materials and spaces, orchestrating new modes of service provision and alternative urban futures" (Castán Broto, 2017). The authors were able to access and report on the development of a strategy of energy consumption reduction and the development of renewable energy sources from 2001 to 2014.

INSERT TABLE 2 ABOUT HERE

While the concept of smart cities includes six axes, our case study focuses on "smart environment", with impact on smart living and smart governance (Höjer and Wangel, 2015). Finally, while others concentrate on the ICT infrastructure, our focus is on smart solutions management, organization and processes (Borsekova *et al.*, 2018).

The context of the project is framed by two contextual elements. First the economic and social environment of the city is directly impacted by the economic crisis and the shortage of employment opportunities. The city, situated in a rural area, is directly dependant on

a few industries that are all facing economic difficulties. Consequently, this has impacted both the finances of the city and the purchasing power of citizens. Therefore, the decrease of expenses in this context was welcome. This contextual factor also limited the capacity to invest in potential energy control activities.

Secondly, the city has the particularity to have its own local electricity provider, which for the last 80 years has been distributing electricity for the town. The electricity provider has been essential in the development of the strategy of the city. One of the advantages for the electric provider was that by prompting energy savings, it also saved in electricity purchases, especially in times when electricity can be sold at high prices, when demand is high.

INSERT TABLE 3 ABOUT HERE

In 2004, the city signed into a project to become a "pilot" city for energy efficiency, and obtained financial help from the two local authorities and the Environmental Protection Agency, as well as Europe to develop its program. The program included both an environmental challenges such as the reduction of impacts on the environment and the development of efficient equipments, but also, economic challenges such as better the competitiveness of small and medium sized enterprises and reduce the financial burden on local households and business organizations. The project contained the development of knowledge on energy consumption as well as on renewable energy sources, the implementation of projects of renewable energy sources developed locally, but also the development of "exemplary" operations, communication towards citizens, training of municipal employees and the diffusion of energy efficient appliances. Actions on energy control were of different types: renewing equipments, bettering equipment or decreasing the need for energy, regulation or programming systems, modifying tariffs and tariffs' timing, modification of consumption habits. They were evaluated with economic, social, pollution (CO_2 emissions) and feasibility criteria. The final impact of the project was measured in term of environmental, economic and social (local development) criteria.

4.2 Data collection

Past studies have concentrated on information from annual reports or posted surveys (Marcuccio and Steccolini, 2007; Bellringer *et al.*, 2011; A. Adams *et al.*, 2014; Schneider *et al.*, 2014; Kaur and Lodhia, 2018) to the exception of Ball (2005) Weir (2018) and Crutzen et al. (2018), that have used participant observation and interviews. In the area of public sector sustainability accounting, it has been advocated to develop the use of interview and observation to better access the underlying motivations of programs and actions developed.

Access was gained in June 2013 to research the strategy and accounting developed by the small town starting 2001, towards reducing its impact on climate change. The mayor gave us the possibility to observe within the local electricity provider for one week in July 2013 and one week during October 2013. The authors were allowed to collect all internal data pertaining to the energy savings and renewable energy policies developed since 2001 available in the archives. Public data was accessed from the township which included all communications on the topic since 2001 and the public discussions within the town council meetings.

Moreover, eight interviews were conducted with the mayor, two with the energy savings expert from the local electricity provider, one with the national Environmental Protection Agency manager in charge of supporting the pilot project, the local electricity provider accountant, the manager of the project at the regional level (Regional District) and two citizens. Table 2 summarizes the data collected for research.

INSERT TABLE 4 ABOUT HERE

4.3 Analysis

Data was analyzed using qualitative analysis software, Atlas.ti. All documents were read and coded around themes emerging from the field, including accounting and accountability elements (number created, reporting), discourse, materiality and the different mechanisms put in place in the city to tackle climate change. A second round of coding around Dean's framework of governmentality (1999) was performed, which included finding out the "problem" identified to be govern and its utopian ideal, the visibilities created, the government mechanisms, the knowledge created and the identities formed (see table 3). From there, an explanation of how the two new identities were created was developed, according to different visibilities, government mechanisms and knowledge created.

5. Findings

Using Dean's framework (1999), we will now present the governmentality mechanisms that were developed from 2001 and 2014 by the municipality to give rise to two new identities: the "good citizen" and the "model city". First a situation that required the activity of governing was identified and problematized. It was connected to a utopian ideal that is that it is possible to govern towards solving the climate change issue. New visibilities were created, as they are necessary for the operation of particular governance regimes (Dean, 1999). Then a set of government mechanisms was put in place (Materiality, exemplarity, pedagogical discourse and financial assistance). New forms of knowledge arose from the activity of governing and to inform this activity. Finally, it led to the formation of two new identities, the "good citizen" and the "model city".

5.1 Acknowledging the city's situation and envisaging the utopian ideal

In 2001 when the new mayor was first elected, he started to worry about the electric bills of the town. He was also aware of the high potential for energy insecurity in many households. Indeed, the average monthly salary was only 1200 Euros and the average pension was 650 Euros in the city. This lead the mayor to gradually introduce reflexions on how he could both ease the burden of electricity cost for the city and for its citizens. This resulted in the signature of the energy control pilot project in 2004, with three phases up to 2014.

Since 2001, the mayor's slogan was "learn to consume better to pollute less so that tomorrow will be cleaner". The objectives of the energy savings and renewable energy strategy were several: to save 15% in energy consumptions in the next 30 years, and to develop an energetic autonomy of 50% by 2015 and 100% by 2020. The objectives were

to be combined with no degradation in comfort for the citizens and while keeping a sustained economic development.

In 2004, the municipal bulletin titled "the best present that we can do to our children is to live the environment as clean as possible, to educate them now to respect our planet. To do this, the city is engaging in an energy control program which will benefit the next generations. Less energy is less pollution, less CO_2, it is moving forward". The city's ambition was to divide CO_2 emissions by four by 2050. To go even further than the question of energy, the mayor said in a public video that his dream was to make the city an "eco-city".

5.2 New visibilities

The first dimension of government is to form new visibilities, making it possible to picture who and what is to be governed, what problems are to be solved and what objectives are sought (Dean, 1999). In the case of this small city, visibilities were created around both electricity consumption, and electricity production, as the main indicators of the problem identified to be governed. Three types of lights were shed on those two elements. First from an energy point of view, with electricity consumption avoided and production from renewable energy, then from a climate change point of view which connected government mechanisms with the utopian ideal of being able to act upon it, and finally from an economic lens that connected the inhabitant with his new identity of "good citizen".

INSERT ABOUT HERE FIGURE 1

In total the city consumed 10% less electricity than other cities in its country. 53% of the energy was ensured by the wind turbines in 2015, and the hospital saved 80 000 euros in 2012 by being connected to the wood heat network. 300 new employment opportunities were created through the wood sector. Table 5 demonstrates the visibilities created by actions on energy savings, renewable energy sources creation and financial assistance to citizens.

INSERT ABOUT HERE TABLE 5

The way the visibilities were created interconnects the environmental to the economic element of sustainability. According to the mayor: "Elected officials must reason in terms of the sector. Only a global approach allows combining the environment and the economy. With the installation of the wood boiler, we set up a wood energy sector that engendered the creation of 300 non-relocatable jobs throughout the region. It is necessary to take advantage of the potentials in presence. I advise the elected representatives to ask themselves what is really the common good and what solutions to put in place to preserve it" (Press article, 2013).

5.3 Governmentality mechanisms

The second dimension of government is to understand by what means, mechanisms and procedures is authority constituted and rule accomplished (Dean, 1999). If government is to achieve ends, or seeks to realize its utopian ideal, it must use technical means (Dean,

1999). In the case of the small city, four governmentality mechanisms were identified: the pedagogical discourse and financial assistance, exemplarity and materiality.

5.3.1 Pedagogical discourse

According to the city programme, "it is necessary to insist on communication to be able to modify behaviours in depth" (Press kit 2012). To do this, the city and the local electricity provider proceeded through different communication channels: population consultations, interactive recommendations, passive communication through different means such as the city bulletin, public consultations, the display campaign and intervention in local schools. According to the city bulletin in 2005, the priority was on "awareness and information on energy-saving gestures". The communication was mainly designed around the economic impact of energy savings and investments in renewable energies. The environmental impact was rarely evoked, however in 2006, the first mention of GHG emissions was made to describe one household's emissions and explain how citizens could impact both direct and indirect emissions, in particular by choosing carefully product and services that they purchased.

Population meetings

End of 2004, three public meetings on thermal renovation and energy saving were organised. Discourse was focused on tips to reduce the electricity bill such as how to manage electric heating, efficient lighting and how to best buy household appliances. To lure people to the meetings, it was advertised that an energy saving bulb would be given to each attendant (per household).

In 2005 early 2006, five public meetings in the different neighbourhoods of the city were organized to inform citizens. Themes were awareness of electricity consumption (how to read an electricity bill, how to optimize one's electricity budget) and presentation of the pilot city project (every day gestures in energy savings, renewable energies and impact on CO_2 emissions reduction). The meetings did not reach many citizens (the largest having taken place with 15 people). However, those meetings were considered an important way to include citizens in the project and to understand potential constraints to the diffusion of energy savings activities in households.

Advice and recommendations for energy savings and renewable energies

The city set up an energy info space and a service to citizens in energy savings and in decision-making for renewable energy investments. The local electricity provider hired a full time energy consultant for this service. This service created a new and stronger link between the employees of the electricity provider and the citizens. The service demonstrated that the electricity provider cared about citizens' well-being and was willing to establish a dialogue. It provided technical assistance to install investments and proposes solutions to better consume electricity.

A tool was also developed by the consultancy on the pilot city project to do individual analysis of electric consumption. This tool allowed individual evaluation of consumptions based on a questionnaire. On this basis, the energy consultant was able to provide a free and individualised energy assessment to any citizen willing to reduce his/her

consumption. The tool was then modified to suit small business organizations' own need for energy assessment, and to provide the same service to organizations willing to invest in energy savings. Two further tools were acquired to provide service to the citizens: a tool to simulate the potential of photovoltaic production, and thereby to verify if an investment was possible, and finally a thermal camera to help citizens understand where they needed to invest in insulation.

Finally, in 2007 a partnership was initiated with the local supermarket to develop an energy savings area, and to train vendors to better understand the energy control project.

Passive communication channels

The city communicated in each town journal from 2002 on energy savings tips and the program of the project (such as investments, meetings). Tips included for example "insulate your attic to reduce your bill by 20%", "replace bath with shower to save 90l of water", "think of off-peak hours to run your machines (by night for example)" or "defrost your refrigerator to save 30% on your bill". Secondly, the electronic billboards of the city relayed information in real time about financial aids as well as about tips to reduce energy consumptions.

INSERT ABOUT HERE IMAGE 1

Starting 2009, flyers were incorporated into invoices to inform users in a playful way of the actions of energy savings possible at home. The Facebook page and website of the electricity provider were also used to reinforce messages on energy savings and renewable energy.

Pedagogical interventions for pupils and students of local schools

As soon as 2007, the consultancy in charge of helping out on the piloting of the energy control project proposed to conceptualize playful modules for primary schools and modules adapted to both secondary schools and high schools. Pedagogical interventions were also linked to actual sighting of material elements such as the wind turbines, the wood heat networks or passive energy housing:

"I have children who participated in energy savings days organized by the local electricity provider. They went to see the wind turbines, a group came to my house to visit it, they also saw the wood boiler room. Pedagogy goes through that." (Interview Citizen 2)

5.3.2 Financial assistance

Within the project, a large panel of financial aids were developed to encourage households to invest in energy savings appliances or to invest in renewable energy appliances: "the client-citizen becomes an actor and reclaims ownership on the operations of the project" (Mayor, public video). The first financial support was created to allow the investment in solar water heaters. Not only did the project include a financial aid, but within the project, the consultancy, the city and the electricity provider worked on designing the best overall system, including working with banks and social organizations, to allow the first year cost to be minimal. The second financial support developed was linked to wood heaters:

“In the long run, I think people are realizing the interest they have (in this project) - as individuals – through their bills, which are lighter than elsewhere. People need some hard evidence to realize that it's interesting” (Interview Citizen 2)

INSERT ABOUT HERE IMAGE 2

Financial assistance was often combined with free consultancy to achieve the best buy, the best energy savings and the best financing. For example in 2005, a program was launched to enhance house heating, it combined the help of the city’s electricians, the service by the energy consultant of the local electricity provider and financial support.

INSERT TABLE 7 ABOUT HERE

5.3.3 Materiality

The city invested considerably in developing renewable energy sources for its energy consumption. Projects were subsidized from different public sources such as the national Environmental Protection Agency or European funding. All projects that were adopted had to prove that their cost structure would ensure savings for users and the city before they were launched. The city followed an energy savings and renewable energy strategy, but balanced its choices with economic soundness.

Wind turbines

Faced with declining oil resources and environmental risks, the city believed it was essential to diversify energy production, and evoqued the building of wind turbines as early as 2002. Wind energy is one of the alternative solutions to fossil fuels, and the region in which the city is situated as strong winds. However, the city believed that benefits of wind turbines should come back to citizens. Therefore, the project was conceived as the first public wind park. Today, the four two-megawatt turbines together contribute to more than 50% of the electricity consumed each year in the city. The profits generated by the wind turbines were reinvested in the municipality, particularly to allow financial support to citizens that are willing to invest in energy saving products: “the creation of this wind farm, the first public park in (country), shows that local authorities are able to understand comprehensively the problem of energy and to make it an axis of their territorial development” (Press kit 2011). According to a citizen interviewed, there was no hostility to the project; according to him it was because the project was entirely public.

INSERT ABOUT HERE IMAGE 3

After having installed the four wind turbines, the mayor started the project of a mega wind turbine that could produce 7,5 MWh, in order to achieve 100% autonomy in electricity production. This project was abandoned at the change of municipality head in 2014.

Wood heat networks

The city developed two wood heat networks. The first one was developed to heat a school, a sport hall, a canteen and the tax office. The second was developed to heat the secondary schools, one kindergarten, a sport hall and the hospital through a two kilometres network. Both powered 300 kW and 1,5 mW respectively. To be able to ensure the continuity of service in wood pallets, the city supported the development of a wood economic sector in the region. 300 new jobs were created through this initiative in the region. The impact on cost for the users is a reduction of 10% compared to the prior year's reference. Moreover, the local electricity provider, which managed the networks, promised to transform the profits from this new renewable energy into financial aids for local citizens so that they could themselves invest in energy saving appliances or habitat renovation opportunities.

In 2014, the wood heat network was extended into the city centre to connect eight new customers including schools. In 2016, for the first time, the network was able to provide heating to 30 private housings.

Solar panels

After having developed wind as the first renewable energy source of the city, in 2008, the city decided to study the implementation of a photovoltaic field. The project delivered the equivalent of 25 households' consumption in electricity. The photovoltaic panels were bought from a local provider, the first to provide panels that were easily recyclable so that the energy source stays green including at the dismantlement stage.

INSERT ABOUT HERE IMAGE 4

The eco-district

As soon as 2007, the city looked for the right space to allow the construction of an eco-district. In 2009, the city developed the project further. This district was to have low energy demand, use renewable energies, locally dispose of waste, reuse storm waters, use sustainable resources to construct housing, and be integrated to the city in a manner that would reduce the need to use the individual car. The project was still ongoing when the authors left the field.

The building of the future

One of the last projects initiated before the municipality changed was the "building of the future". It was designed to welcome companies offering innovative solutions in the field of sustainable development. It is also designed to allow the development of vocational training in sustainable development. The building was also to be a model of new sustainable building, self-sufficient building in energy consumption and able to ensure a higher energy production to supply the surrounding equipment. Finally, the municipality wanted to establish the virtual power station of the project "territorial energy intelligence for the community" in the building.

The methanization unit

In 2013, a study was conducted in conjunction with the agriculture chamber to start a methanization unit that would allow the treatment of, for example, sludge from the

purification station, green waste and food waste. This would generate gas that would then be used to produce electricity or heat that could be redistributed in the heat network of the city. One of the citizens interviewed said that this project was also to allow the integration of the population of farmers into the energy control project, because they would be able to deliver agriculture sludge for the methanization unit. In this rural area, 80% of elected representatives are farmers that did not feel like the energy control project was for them until the project was started.

The smart electricity meters of the project "territorial energy intelligence for the community"

According to the mayor, this project was "the meeting with our citizens" (Mayor, public video). The project aimed to test with 750 homes and 50 commercial users an intelligent management system of electric network service territory. It relied on the development and testing of a centralized computer system managing the balance at the territory level, coupled with storage solutions, and an animation of energy savings through different modes of communication to involve a maximum of users. To have exact knowledge of consumptions, households were encouraged to accept an innovative counting system through a new smart electricity meter. The meter analyzed your data at a distance and allowed to track superfluous consumptions:

"It is true that it is a source of economy. Here too, there is an educational role: to demonstrate to people, to explain to them the possible gains in terms of consumption. It also goes through that. Unfortunately, for people to consume less, you have to prove to them that it costs them less. If we tell them we have to do something for the environment, I'm not sure they will do it instinctively. I think we have to go through other ways to show them that if they consume less, it costs them less." (Interview Citizen 2)

5.3.4 Exemplarity

The city demonstrated its exemplarity through several actions. Firstly it launched in 2004 a pilot project of "energy control" which was the first in its region, but also a model for other cities in its country and in Europe through its national media coverage. Secondly it developed actions to reduce its own energy consumption. Thirdly, it amended local legislation to allow for solar panels to be installed and thermal insulation to be performed on the outside.

Piloting its own "Energy Control project"

The goal of piloting a city project like this was to become the model for other cities: "we have to stop small examples and scale the efforts: the city is like the region in small, and the region is like the country in small!" (Environmental Protection Agency in a press document). According to the mayor, the project was a civic duty:

"The strategy was to carry out an energy study of all the consumption of their customers. All this was done to try to understand who was consuming what, for what purpose, in the territory of the city, in order to put in place a project oriented towards the management and control of the energy demand - and not a policy of the offer, like the one we usually do. The latter consists in setting up power stations and, behind, we want customers to

consume. Here, it was the opposite, we wanted to have a territorial logic to understand the consumption of people, and see where we could act." (Interview Environmental Protection Agency)

Reducing the city's own energy consumption

Since 2006 the city implemented two actions to reduce electric consumption from public lighting. First new lights were equipped with bulbs that use five times less electricity than previous bulbs. Then, lights were equipped with power reduction gears that allowed to prolong the life of bulbs and reduced consumption by 25%. Finally at night, after eleven p.m. only one in five bulbs is actually lit.

In 2009, the city voted a budget to perform a thermal rehabilitation of all schools. The investment allowed saving nearly 1000 MWh of electricity, nearly half of what is currently used. Work performed included the insulation of roofs, walls (inside or outside) and the change of windows to double-glazing.

The city hall bought twelve electric bikes and the mayor's vehicle, as well as one of the local electricity provider's service vehicles are electric too.

Display campaign on public buildings

The "display" campaign was decided in 2006. It was an engagement of the city township to transparently post the water, CO_2 and energy characteristics of public buildings. The format looked like an energy label used on household machines to display their energy efficiency. The communication was meant to restate again the engagement of the city to drive improvement in energy consumption. Fourteen buildings were equipped with those posters. Posters also displayed the type of energy used and the possibilities to move the building to an "A" category in each criterion. Seven buildings as well as all schools and sport halls were engaged in the display campaign.

Legislation change

The revision of the Local Urban Plan was requested in 2006: it enabled the integration of solar panels and the possibility to make the thermal insulation from the outside. It also allowed the construction of bioclimatic housing, the use of geothermal energy and the possibility to recovery of storm water.

5.4 Knowledge created

"Power is not only about repression but also about productivity – the power to produce knowledge about the environment is key in formulating the terms of its management" (Rutherford, 2007, p. 296). The third brick of Dean's government practices (1999) is the production of knowledge about the issue to be governed. "To know, to measure, to assess, to document risk, and propose its necessary remedies" (Rutherford, 2007, p. 298) are the tools that the new knowledge created proposes to construct and circumscribe the problems and their self-evident solutions. The city built several types of knowledge: energy consumption knowledge from business organizations and citizens, as well as knowledge on public building consumptions and the possibility to transform housings to

be less impactful on climate change, strategic knowledge through energy councils and carbon footprinting, and technical knowledge through feasibility studies of renewable energy sources' projects.

INSERT TABLE 8 ABOUT HERE

5.4.1 Population energy consumption knowledge

Specific knowledge on the exact energy consumption of both business and private consumers of electricity in the city was created. It was necessary to identify the future impacts of the energy savings actions developed during the project. It was also necessary to be able to simulate the impact of potential savings linked to household investments. That knowledge was also easy to convert into monetary savings.

Between 2004 and 2006, the consultancy conducted a first measurement campaign on 150 customers of the electricity provider. It was followed by a second questionnaire that allowed a small-personalized diagnosis of energy consumptions.

In 2009, an operation of analysis of the consumption of energy by the cities' household was launched, in order to improve the knowledge of the effects of the sensitization and the actions of energy control activities on the consumption of citizens. A panel of fifteen households was accompanied for one year. This panel benefited from help to buy small performing equipment such as multiple sockets with switch and personalized advice of the energy specialist of the local electricity provider. The lessons of this campaign were used to improve communication towards the citizens.

5.4.2 Strategic knowledge

In 2003, the city developed the first step into managing energy: the energy orientation council. In 2006, it led the development of an intercommunal energy council. An intercommunal energy was an initiative of the environmental protection agency and the region. The municipalities have often many building that require renovation work. However, energy savings are often not integrated due to lack of technical advice. It aimed at sensitizing elected representatives to the theme of energy savings and control, and to support the reflection on how to better municipal buildings' energy consumptions through exchange of experiences, confrontations of know-how, or by pooling resources. The environmental protection agency also assisted the technical level by giving them the necessary elements for their decision-making and organization in the field of energy savings at the municipal or inter-municipal level.

In 2008, the city carried out a carbon footprint to understand the impact of its activity on greenhouse gas emissions. The total greenhouse gas emissions of the city was 1,200 tonnes C02e. It was strongly dominated by the energy consumption of municipal buildings (61% heating and 10% electricity consumption of inhabitants).

5.4.3 Technical knowledge (renewables)

Throughout the years, technical studies were conducted to implement solar panels, wood heat networks, wind turbines, a methanization plan and for the mega wind turbine. The

technical studies were meant to acquire the necessary knowledge not only to render those projects feasible technically, but also to confirm that the projects were also viable economically, as all new projects needed to have a return on investment for the community.

5.5 The creation of new "identities"

Governing operates through the forms of identities created. Regimes of government will promote and foster capacities, qualities and statuses to particular agents (Dean, 1999). They are successful if they make those agents come to experience themselves as, for example, "good citizens".

5.5.1 The "good citizen"

The energy savings and renewable energy strategy of the city was developed to be inclusive: engaging the citizens and developing energy savings "for everyone". This was a key step for the project as citizens represent up to 50% of greenhouse gases emissions in the country where the city is situated. At the beginning of the project 51% of citizens answered they were "very interested" by the perspective of the energy control project, and 19% were just "interested", while 30% said they were not interested. However, the result was mixed. While there has been little opposition to the city strategy (according to a press kit, 60% of citizens were for the project, only 10% were against), the city acknowledged that "the citizens were the targets that were less involved in the operation, and the financial question remains the main sticking point" (Press kit 2012).

The identity of the "good citizen" was created through several steps: first the visibilities of energy consumption, production and financial savings. The economic aspect of the project was key to make the identity of the "good citizen" come to life. Secondly, the constant pedagogical discourse about how citizens could save on energy, and invest in energy savings appliances, accompanied by financial assistance, were the two key mechanisms that led to the construction of how a inhabitant could be formed as a "good citizen", participating in overall efforts to lower consumption, and turn to "greener" energy production sources. Exemplarity and materiality, while not being essential, were present in the construction of the identity by allowing inhabitants to create eco-homes and materialize their new identity through driving electrical bikes. However, while identity of the "good citizen" was created, but the identification of the citizens with it was minimal (Dean, 1999).

INSERT FIGURE 2 ABOUT HERE

First, the visibilities created where diffuse as the sources of energy savings were multiple and represented small quantities. Citizens were encouraged to make small "citizen" acts via illustration of potential savings, however the main savings required investing, which in this rural area remained difficult. Those difficulties were acknowledged: "it is an approach which is engaged, it is important. We are still in sectors where, economically, it is complicated. So, it is always good to have an image that is not only negative. Saving energy is something in the long run. The result is not necessarily immediate, it will come with time. After, it will develop, it will take on importance. Why not have a factory manufacturing wind turbines here? It takes time for it to become anchored" (Interview

Citizen 2). The project was also built to reinvest profits in financial aids towards investments by households. For example, the profit of wind turbine energy projection was transformed into gift vouchers to buy appliances that allow energy savings. This virtuous circle was important for the engagement of citizens, but necessitated a long-term view to allow investments to produce the profit that would then benefit citizens.

Despite the pedagogical discourse engaged and sustained over the whole period of the project, interviews revealed both that the general impression was that behavioural change had indeed happened: "I think what we do, makes things happen. What is important is to move things forward, to change our lifestyles, consumption, our modes of operation, to adapt to new conditions" (Interview Citizen 1). Collectively, the city has managed to reduce consumption by 7% during the whole program (Mayor in online public video). The consultant who worked on collecting data from the citizens for the project acknowledged that he met a lot of curious people, enthusiasts and even thrilled by the city's strategy, and engaged the conversation with many on energy saving tips. However, also he states the "education process is running", he also acknowledged that "it will take time (Consultant on the project, press kit).

To conclude, the project is more than engaging citizens in reducing their climate change impact. It was developed to re-initiate a positive local dynamic economically and socially. The project is long-term and although results are visible for citizens, difficulties in engagement for environmental sustainability when the economic terrain continues to remain tough are harder to overcome.

While it was difficult to engage citizens, business organizations have themselves developed an interest in the city's strategy. For example, the city's hospital developed its own internal communication on energy savings, hired an energy specialist in house, and commissioned a study on the hospital's energy consumption. This is turned prompted the hospital management to invest in low energy machines and energy savings appliances such as thermostats.

5.4.2 The "model city"

According to the mayor, the city was a laboratory, supported by the national environmental protection agency, the region and Europe. The city participated several times in national events to demonstrate that "it is possible, at our level, to develop sustainability actions", and that despite the level of investments necessary to start a program:

"I think the change will come like that, through local initiatives. Plus, it's the best way to inform people. We do it in our small place, but it's possible, we do it. It's to show that it can exist and that it Works." (Interview Citizen 1)

The identity of the "model city" was created through giving visibility to CO_2 emissions reduction and renewable energy production, and this was embodied in material elements around the town and concretized through exemplarity actions from the town itself. Strategic knowledge on tackling climate change (such as with carbon accounting) was created, as was technical knowledge on renewable energy production. This expressed visibly the town's expertise and leadership in tackling climate change at the time (the

project started in 2001). The goal of the city in participating in national events was to lure in more cities interested to adopt its strategy.

INSERT FIGURE 3 ABOUT HERE

Nationally, the story of the city's project became known: "There are nurses who have heard of (the city), who think it's great, it's a city that is active. Its' good" (Interview Citizen 1). Other interviews mentioned people living in other regions of the country having heard of the city's project. Some elected representatives came and visited the local electricity provider and the renewable energy sources. One the citizens we interviewed even said "I have more conversation with people outside of the city who want to understand how it was managed, what is the impact. When you have 53% of your energy coming from wind turbines, it's impactful" (Interview Citizen 2).

The city's position of "pilot" city enabled it to receive financial subsidies that covered up to 70% of its investments. The profitability of its actions was achieved after from two to ten years, with equipments that are invested in for thirty years. The city aimed at reinvesting profits into new ecological actions in the future. By doing so, the mayor aimed to attracting business organizations interested in environmental sustainability products and services, that would then continue to develop cities' own sustainability strategy. As the mayor said in several interviews, it is "virtuous circle".

INSERT TABLE 9 ABOUT HERE

5.4.3 The next generations

While the mechanisms have rendered the "good" citizen and the "model" city visible, it also allowed a new identity to emerge: the next generations. Through both materiality mechanisms and exemplarity mechanisms, the city demonstrated that it could impact on next generations now by making choices that would allow them to live in good conditions. This was also visible in one of the discourse published in a municipality bulletin on how the project would serve "our children".

First there was pedagogical discourse in the direction of school children from primary to secondary schools. Secondly, there were investments made (notably in wind power but not only) that span generations in terms of use. Thirdly there were some key long-term changes made for example to legislation that will affect how future generations can for example invest in renewable energies or build eco-houses.

INSERT TABLE 10 ABOUT HERE

6. Discussion

Through this qualitative longitudinal study of one small city's energy control strategy, two main contributions are made to the literature. First, the different mechanisms developed for climate change governance were analyzed and the identities created over time were investigated. While the new identity of the city as "model" for future policy-making and other cities worked well, the development of the identity of the "good citizen" proved more difficult. The constant use of economic discourse, justified throughout the project as

a response to the social situation of the citizens, might be a key to explain partially the discrepancy between the two identities. Secondly, the role of mechanisms such as materiality and exemplarity were emphasized, contributing to the literature on governmentality. Indeed, these did not appeal directly to calculative practices to exert governance on the target population. Thirdly, contributions to how small cities can contribute to tackling climate change are developed. Finally, we discuss implications of this case study for sustainability management controls in the public sector.

6.2 The double-sword role of economic discourse in creating the "good" citizen

Our case study demonstrates the difficulty of creating the new identity for citizens to identify with: the "good citizen", the responsible citizen that will constantly think of energy savings and invest in renewable energy to lower its impact on climate change. Achieving changes in mindset require time, patience and determination: "If you find a 50 Euros note on the ground, you will stoop to pick it up. If now you find 1000 coins of 5 cents, you may well rush less! Controlling energy is the same. Coins scattered that we can pick up little by little, but ultimately it will represent a lot!" (Consultant on the project, press kit). Moreover, it is difficult to have a positive discourse on energy savings: "it is extremely gratifying to speak about growth and production", but speaking of rational management or savings in energy is "austere and negative" (Consultant on the project, press kit).

Previous literature had demonstrated that the emphasis on individual behavior change through governmentality mechanisms such as creating the "good citizen" identity had for consequences of displacing responsibilities for carbon reduction onto often poorer citizens, leaving the problem to be addressed via consumer choice (Revell, 2013; Rice, 2013; Castán Broto, 2017). In that case local authorities play the role of educators (such as with the pedagogical discourse here), which often constitutes an indirect and ineffective mean of achieving climate change action and results.

Secondly, while materiality and exemplarity mechanisms were there to develop positive emotions, a sense of pride, the pedagogical discourse on savings and austerity, insisting on economic aspects of energy consumption reductions, could have triggered sentiments of guilt, and responsibility for the situation.

Within the project however, all mechanisms were seen as being a whole, an association between the environmental, the economic and the social. The mayor thought that by emphasizing savings, it would impact positively the environment, and vice-versa:

"We realize that it's a loop. The environmental (project) will render us less dependent. Socially, it will be good to the extent that people will have a lower bill. For me, everything is linked. The environment helps to improve the social. For me, it's related" (Interview Citizen 2)

While the sentiment of the municipality was that citizens were not engaged because of lacks of mean to invest in energy savings appliances, the answer could also lie in the lack of linkages made between positive mechanisms (creation of new sources of energy for example, serving as "model" city) and mechanisms that played on notions of austerity. Those linkages are also made through long-term associations, such as when investments

in wind turbines allowed for redistribution of gains to the citizens, and might have not be emphasized enough in practice.

6.2 The role of materiality in exerting governance for climate change

Materiality mechanisms are mechanisms that use material artefacts to exert governance on the target population. Material artefacts are necessary to know and to learn, as much as the mind (Carlile *et al.*, 2013). They trigger a range of cognitive and emotional responses that "transform the audience into active co-creators and communicators of symbolic meaning" (Boxenbaum *et al.*, 2014).

First materiality gives form to abstract ideas such as "sustainability" or "climate change". In the case of governing climate change and creating a new "good citizen" identity, material artefacts rendered visible the actual possibility to save energy (smart meters for example) and to locally create one's own sources of "clean" energy (through wind turbines). What remains to be understood however, is what kind of material artefacts were better at focusing attention of citizens, the state and other cities towards the objective of governing climate change. One could also ask whether the multiplication of artefacts did not play a counterproductive role in achieving focus on the topic – or on the contrary, whether the scattering of material artefacts within all parts of the city created a relevant net of visual artefacts that citizens could not escape. For example, we were shown how the wind turbines were visible from the top of the city's main street – a proof that material artefacts were carefully chosen and placed to achieve the creation of new identities.

Second, materiality will entice interpretations and provoke emotional responses from citizens (Boxenbaum *et al.*, 2014). While our dataset did not allow us to capture what the population felt about the material artefacts deployed around the city, one could imagine that emotions such as pride (for the public park of wind turbines) and ownership of the project would have been consequences of the development of renewable energy sources.

6.3 Small cities and governing climate change

While mega cities and metropolitan regions normally get the attention of politicians, city planners and the international media (Borsekova *et al.*, 2018), this research sheds light on how smaller cities can develop smart cities strategies and governance mechanisms to tackle climate change.

It is important to develop case studies of smaller cities as "local governments can be more innovative and more responsive to local environmental preferences and economic circumstances" (Lutsey and Sperling, 2008). The impact of small cities dealing with climate change issues could be multiplied if cities take example on possible strategies and arrangements made by counterparts. In the US, the commitments of lower government on climate change are now amounting to a substantial emission-reduction commitment (Lutsey and Sperling, 2008). Additionally, "local authorities are in a privileged position to involve the wider community in designing and implementing climate policies, engaging with both the technological aspects of energy generation and the delivery of sustainable demand-side energy management strategies" (Melica *et al.*, 2018).

In the example of the small European city, their was not only governance mechanisms that were put in place, but also a policy of long term investment into renewable energies that is not possible without the support of other public actors such as the environmental protection agency, or some national or European financing opportunities. The city also created the possibility to exchange its knowledge with nearby municipalities through strategic meetings. As lower levels of government remain legally and financially ill-equipped for addressing climate change (Melica *et al.*, 2018), a network of support is necessary to achieve the implementation of many aspects of the mechanisms described in the study, including materiality, but also exemplarity and financial assistance.

Moreover, that investment strategy is counter intuitive in political environments where decision-making tend to be impacted by short-term elections results, and therefore it requires courage to invest in elements (wind power, solar power) that will impact not only the political term (4 to 6 years) but also future generations. While the major was re-elected and was able to follow up his project for 13 years, the impact would have been even more visible with the enrolment of citizens, which was ineffective.

The long-term investments were also thought for the future energy independence of a city where electricity bills were on the rise. In a rural area with high unemployment, the economic aspect of the investment is also to be stressed, as small cities are constantly forced to seek for new impulses of development and efficient use of internal resources (Borsekova *et al.*, 2018).

6.4 Sustainability management controls for the public sector

Research has demonstrated that local authorities that wanted to put themselves forward as leaders were more likely to adopt environmental management controls (Qian *et al.*, 2011). In our case study, the small city built a case for being a role model and did apply its controls and targets on its own buildings for example. However, more importantly this positioning also aimed at emphasizing the possibilities for the population to also act (the "good citizen"). Therefore we complement previous literature on the public sector sustainability management control by emphasizing first the necessity to have two types of controls: classic internal controls, and external governance mechanisms, and second the interrelation of both types of controls, as governance mechanisms relied on the existence of internal ones to exist.

Previous research has also demonstrated that the environmental management accounting information developed was lacking the possibility to account for the future, or the long term (Qian *et al.*, 2011), a necessity to link environmental management objectives with sustainability (Gibassier and Alcouffe, 2018). However, in the case of the small city, material controls were established to embed the long term within the daily life of citizens, and financial assistance was targeted at long term investments.

Thirdly, research states that if you can couple environmental management accounting needs with cost efficiency and performance, you are more likely to achieve adoption (Qian *et al.*, 2011). However in our case, the tentative to embed the economic discourse as a major incentive to adopt "good citizen" habits was not met with success. We nuance the possibility that an economic drive to adopt environmental management controls could

lead to long term and profound change, whether in a local public organization or within the population's own habits.

Finally, we concur with the conclusion of Qian et al. (2011) that environmental management accounting needs to be embedded within a supply chain to affect not only how local governmental bodies achieve sustainability, but also how the industry (whether in waste, or energy or other sustainability challenges) can harness efforts. Qian et al. (2011) called for larger upstream and downstream environmental management accounting systems in which local administrations could be embedded, to achieve wider change, towards sustainable development.

7. Conclusion

Our research contributes to our understanding of environmental sustainability strategies developed by small smart cities. Through the longitudinal case study of a small city's energy control project, contributions are made to the literature on climate change control in public sector organizations and to the literature on governmentality, especially in application to sustainability.

Our results demonstrated that governmentality mechanisms do not have to resort to calculable practices to exert control over the target population. While extensive knowledge was created on energy consumption and production to perform governance, it was not used as a mechanism to govern as such. We therefore contributed to the literature on governmentality by emphasizing the role of materiality in developing environmental sustainability governmentality mechanisms.

Secondly, the balance between the different governmentality mechanisms in use was discussed. Notably their role in triggering emotions that led to the non-identification of inhabitants to the "good citizen", but however developed a "model city" to which other municipalities did identify, is analyzed. In our case materiality mechanisms were exerted to trigger positive emotions of ownership of the project and pride, while the economic discourse developed through communication and financial assistance was a constant reminder of the burden of energy in household budgets, developing notions of guilt and responsibility.

Our study is not without limitations. Citizens were not accessed other than through two interviews, minimizing the possibility for the study to further develop the impact of mechanisms on citizens. Moreover, we were not able to access the different arguments used during political campaigns for re-election, that would have allowed understanding better why the mayor in charge of the energy control project failed to be re-elected in 2014.

Future research could further develop our understanding of governmentality mechanisms that are developed in different arenas such as cities, regions and states. Indeed, while studies have analyzed sustainability controls and reporting mechanisms in the past, the literature still fails to understand how the engagement of the wider population could be achieved in the public sector, towards achieving sustainability (Frame and Bebbington, 2008; Russell and Thomson, 2009).

References

Adams, A.C., Muir, S. and Hoque, Z. (2014), "Measurement of sustainability performance in the public sector", *Sustainability Accounting, Management and Policy Journal*, Vol. 5 No. 1, pp. 46–67.

Aggeri, F. (2005), "Les régimes de gouvernementalité dans le domaine de l'environnement", in Hatchuel, A., Pezet, E., Starkey, K. and Lenay Olivier (Eds.), *Gouvernement, organisation et gestion: l'héritage de Michel Foucault*, Presses Universitaires de Laval, pp. 431–464.

Ball, A. (2002), *Sustainability Accounting in UK Local Government: An Agenda for Research*.

Ball, A. (2005), "Environmental accounting and change in UK local government", *Accounting, Auditing & Accountability Journal*, Vol. 18 No. 3, pp. 346–373.

Ball, A. and Bebbington, J. (2008), "Editorial: Accounting and Reporting for Sustainable Development in Public Service Organizations", *Public Money & Management*, Vol. 28 No. 6, pp. 323–326.

Ball, A. and Grubnic, S. (2007), "Sustainability accounting and accountability in the public sector", in Unerman, J., Bebbington, J. and O'Dwyer, B. (Eds.), *Sustainability accounting and accountability*, Routledge, London, New York, pp. 243–266.

Ball, A., Mason, I., Grubnic, S. and Hughes, P. (2009), "The Carbon Neutral Public Sector", *Public Management Review*, Vol. 11 No. 5, pp. 575–600.

Baudet, M.-B. and Landrin, S. (2012), "La ville, clé de la survie de la planète", *Le Monde,* 11 December, available at: http://www.lemonde.fr/planete/article/2012/12/11/la-ville-cle-de-la-survie-de-la-planete_1804022_3244.html.

Bebbington, J. (2004), "Governance From The Perspective of Social/Environmental Accounting", *Social and Environmental Accountability Journal*, Vol. 24 No. 2.

Bellringer, A., Ball, A. and Craig, R. (2011), "Reasons for sustainability reporting by New Zealand local governments", *Sustainability Accounting, Management and Policy Journal*, Vol. 2 No. 1, pp. 126–138.

Borsekova, K., Korény, S., Vaňová, A. and Vitálišová, K. (2018), "Functionality between the size and indicators of smart cities: A research challenge with policy implications", *Cities*, Vol. 78, pp. 17–26.

Boxenbaum, E., Jones, C., Meyer, R.E. and Svejenova, S. (2014), "Call for Papers: The Material and Visual Turn in Organization Theory: Objectifying and (Re)acting to Novel Ideas", *Organization Studies*, Vol. 35 No. 11, pp. 1731–1736.

Burritt, R.L. and Welch, S. (1997a), "Accountability for environmental performance of the Australian Commonwealth public sector", *Accounting, Auditing & Accountability Journal*, Vol. 10 No. 4, pp. 532–561.

Burritt, R.L. and Welch, S. (1997b), "Australian Commonwealth Entities: An Analysis of Their Environmental Disclosures", *Abacus*, Vol. 33 No. 1, pp. 69–87.

Carlile, P.R., Nicolini, D., Langley, A. and Tsoukas, H. (2013), "How matter matters: Objects, artifacts, and materiality in organization. Introducing the third volume of "perspectives in organization studies"", in Carlile, P.R., Nicolini, D., Langley, A. and Tsoukas, H. (Eds.), *How matter matters: Objects, artifacts, and materiality in organization*, Oxford University Press, pp. 1–16.

Castán Broto, V. (2017), "Urban Governance and the Politics of Climate change", *World Development*, Vol. 93, pp. 1–15.

Cohen-Rosenthal, E. (2000), "A Walk on the Human Side of Industrial Ecology", *American Behavioral Scientist*, Vol. 44 No. 2, pp. 245–264.

Cooper, S. and Pearce, G. (2011), "Climate change performance measurement, control and accountability in English local authority areas", *Accounting, Auditing & Accountability Journal*, Vol. 24 No. 8, pp. 1097–1118.

Crutzen, N., Zvezdov, D. and Schaltegger, S. (2017), "Sustainability and Management Control. Exploring and theorizing control patterns in large European firms", *Journal of Cleaner Production*, Vol 143, pp. 1291-1301.

Crutzen, N., Bounazef, D. and Qian, W. (2018), "Developing Sustainability Mobility Controls: The Case of Four Belgian Local Governments", *Social and Environmental Accountability Journal*, Vol. 21 No. 1, pp. 1–26.

Dean, M. (1999), *Governmentality: Power and rule in modern society*, Sage, London.

Dilworth, R., Stokes, R., Weinberger, R. and Spatari, S. (2011), "The Place of Planning in Sustainability Metrics for Public Works: Lessons From the Philadelphia Region", *Public Works Management & Policy*, Vol. 16 No. 1, pp. 20–39.

Dobbs, S. and van Staden, C. (2016), "Motivations for corporate social and environmental reporting: New Zealand evidence", *Sustainability Accounting, Management and Policy Journal*, Vol. 7 No. 3, pp. 449–472.

Dumay, J., Guthrie, J. and Farneti, F. (2010), "Gri Sustainability Reporting Guidelines For Public And Third Sector Organizations", *Public Management Review*, Vol. 12 No. 4, pp. 531–548.

Farneti, F. and Siboni, B. (2011), "An analysis of the Italian governmental guidelines and of the local governments' practices for social reports", *Sustainability Accounting, Management and Policy Journal*, Vol. 2 No. 1, pp. 101–125.

Fernandez-Anez, V., Fernández-Güell, J.M. and Giffinger, R. (2018), "Smart City implementation and discourses: An integrated conceptual model. The case of Vienna", *Cities*, Vol. 78, pp. 4–16.

Frame, B. and Bebbington, J. (2008), "Towards governmentalities for sustainable development", *Working Paper*.

Gauthier, C. and Gilomen, B. (2016), "Business Models for Sustainability", *Organization & Environment*, Vol. 29 No. 1, pp. 124–144.

Gibassier, D. and Alcouffe, S. (2018), "Environmental Management Accounting: the missing link to sustainability?", *Social and Environmental Accountability Journal*, Vol 38, No. 1, pp. 1-18.

Global Reporting Initiative (GRI) (2005), *Sector Supplement for Public Agencies*.

Gouldson, A. and Bebbington, J. (2007), "Corporations and the Governance of Environmental Risk", *Environment and Planning C: Government and Policy*, Vol. 25 No. 1, pp. 4–20.

Greco, G., Sciulli, N. and D'Onza, G. (2015), "The Influence of Stakeholder Engagement on Sustainability Reporting: Evidence from Italian local councils", *Public Management Review*, Vol. 17 No. 4, pp. 465–488.

Greco, G., Sciulli, N. and D'onza, G. (2012), "From Tuscany to Victoria: Some Determinants of Sustainability Reporting by Local Councils", *Local Government Studies*, Vol. 38 No. 5, pp. 681–705.

GRI (2005), *Sector Supplement for Public Agencies (Global Reporting Initiative).*

Höjer, M. and Wangel, J. (2015), "Smart Sustainable Cities: Definition and Challenges", in Hilty, L.M. and Aebischer, B. (Eds.), *ICT Innovations for Sustainability*, *Advances in Intelligent Systems and Computing*, Vol. 310, Springer International Publishing, Cham, pp. 333–349.

Holden, M. (2008), "Social learning in planning: Seattle's sustainable development codebooks", *Progress in Planning*, Vol. 69 No. 1, pp. 1–40.

Holden, M. (2013), "Sustainability indicator systems within urban governance: Usability analysis of sustainability indicator systems as boundary objects", *Ecological Indicators*, Vol. 32, pp. 89–96.
Hoppe, T. and Coenen, F. (2011), "Creating an analytical framework for local sustainability performance: a Dutch Case Study", *Local Environment*, Vol. 16 No. 3, pp. 229–250.
Huang-Lachmann, J.-T. and Lovett, J.C. (2016), "How cities prepare for climate change: Comparing Hamburg and Rotterdam", *Cities*, Vol. 54, pp. 36–44.
Kaur, A. and Lodhia, S. (2018), "Stakeholder engagement in sustainability accounting and reporting", *Accounting, Auditing & Accountability Journal*, Vol. 31 No. 1, pp. 338–368.
Krivý, M. (2018), "Towards a critique of cybernetic urbanism: The smart city and the society of control", *Planning Theory*, Vol. 17 No. 1, pp. 8–30.
Lee, J.H., Hancock, M.G. and Hu, M.-C. (2014), "Towards an effective framework for building smart cities: Lessons from Seoul and San Francisco", *Technological Forecasting and Social Change*, Vol. 89, pp. 80–99.
Lemke, T. (2001), "'The birth of bio-politics': Michel Foucault's lecture at the Collège de France on neo-liberal governmentality", *Economy and Society*, Vol. 30 No. 2, pp. 190–207.
Lutsey, N., and Sperling, D. (2008), "America's bottom-up climate change mitigation policy", *Energy Policy*, Vol. 36, pp. 673–685.
Maas, K., Schaltegger, S. and Crutzen, N. (2017), "Integrating corporate sustainability assessment, management accounting, control and reporting", *Journal of Cleaner Production*, Vol 136, pp. 237-248.
Malmi, T. and Brown, D.A. (2008), "Management control systems as a package—Opportunities, challenges and research directions", *Management Accounting Research*, Vol. 19 No. 4, pp. 287–300.
Marcuccio, M. and Steccolini, I. (2007), "Social and environmental reporting in local authorities", Public Management Review, Vol. 7 No. 2, pp. 155–176.
Melica, G., Bertoldi, P., Kona, A., Iancu, A., Rivas, S. and Zancanella, P. (2018), "Multilevel governance of sustainable energy policies: The role of regions and provinces to support the participation of small local authorities in the Covenant of Mayors", *Sustainability Cities and Society*, Vol. 39, pp. 729–739.
Milne, M.J. and Gray, R. (2013), "W(h)ither Ecology? The Triple Bottom Line, the Global Reporting Initiative, and Corporate Sustainability Reporting", *Journal of Business Ethics*, Vol. 118 No. 1, pp. 13–29.
Nam, T. and Pardo, T.A. (2011), "Smart city as urban innovation: focusing on management, policy, and context", Tallinn, Estonia.
Niemann, L. and Hoppe, T. (2018), "Sustainability reporting by local governments: a magic tool? Lessons on use and usefulness from European pioneers", *Public Management Review*, Vol. 20 No. 1, pp. 201–223.
Nogueiro, L. and Ramos, T.B. (2014), "The integration of environmental practices and tools in the Portuguese local public administration", *Journal of Cleaner Production*, Vol. 76, pp. 20–31.
Pancholi, S., Yigitcanlar, T. and Guaralda, M. (2015), "Public space design of knowledge and innovation spaces: learnings from Kelvin Grove Urban Village, Brisbane", *Journal of Open Innovation: Technology, Market, and Complexity*, Vol. 1 No. 1, p. 411.
Pierce, P., Ricciardi, F. and Zardini, A. (2017), "Smart Cities as Organizational Fields: A Framework for Mapping Sustainability-Enabling Configurations", *Sustainability*, Vol. 9 No. 9, p. 1506.

Pitts, D.W. and Fernandez, S. (2009), "The State of Public Management Research: An Analysis of Scope and Methodology", *International Public Management Journal*, Vol. 12 No. 4, pp. 399–420.
Qian, W., Burritt, R. and Monroe, G. (2011), "Environmental management accounting in Local Government", Accounting, Auditing & Accountability Journal, Vol 24 No. 1, pp. 93-128.
Revell, K. (2013), "Promoting sustainability and pro-environmental behaviour through local government programmes: examples from London, UK", *Journal of Integrative Environmental Sciences*, Vol. 10 No. 3-4, pp. 199–218.
Rice, J.L. (2013), "Public Targets, Private Choices: Urban Climate Governance in the Pacific Northwest", *The Professional Geographer*, Vol. 66 No. 2, pp. 333–344.
Russell, S. and Frame, B. (2013), "Technologies for sustainability: a governmentality perspective", *International Journal of Sustainable Development*, Vol. 16 1/2, p. 91.
Russell, S.L. and Thomson, I. (2009), "Analysing the role of sustainable development indicators in accounting for and constructing a Sustainable Scotland", *Accounting Forum*, Vol. 33 No. 3, pp. 225–244.
Rutherford, S. (2007), "Green governmentality: insights and opportunities in the study of nature's rule", *Progress in Human Geography*, Vol. 31 No. 3, pp. 291–307.
Sarzynski, A. (2015), "Public participation, civic capacity, and climate change adaptation in cities", *Urban Climate*, Vol. 14, pp. 52–67.
Schneider, A., Samkin, G. and Davey, H. (2014), "Biodiversity reporting by New Zealand local authorities: the current state of play", *Sustainability Accounting, Management and Policy Journal*, Vol. 5 No. 4, pp. 425–456.
Spence, L.J. and Rinaldi, L. (2014), "Governmentality in accounting and accountability: A case study of embedding sustainability in a supply chain", *Accounting, Organizations and Society*, Vol. 39 No. 6.
Tregidga, H. (2013), "Biodiversity offsetting: problematisation of an emerging governance regime", *Accounting, Auditing & Accountability Journal*, Vol. 26 No. 5, pp. 806–832.
Trindade, E.P., Hinnig, M.P.F., da Costa, E.M., Marques, J.S., Bastos, R.C. and Yigitcanlar, T. (2017), "Sustainable development of smart cities: a systematic review of the literature", *Journal of Open Innovation: Technology, Market, and Complexity*, Vol. 3 No. 1, p. 234.
Vallentin, S. and Murillo, D. (2011), "Governmentality and the politics of CSR", *Organization*, Vol. 19 No. 6, pp. 825–843.
Vanolo, A. (2014), "Smartmentality: The Smart City as Disciplinary Strategy", *Urban Studies*, Vol. 51 No. 5, pp. 883–898.
Weir, K. (2018), "The purposes, promises and compromises of extinction accounting in the UK public sector", *Accounting, Auditing & Accountability Journal*, Vol. 20 No. 3.
Whiteman, G., Vos, D.R. de, Chapin, F.S., Yli-Pelkonen, V., Niemelä, J. and Forbes, B.C. (2011), "Business strategies and the transition to low-carbon cities", *Business Strategy and the Environment*, Vol. 20 No. 4, pp. 251–265.
Zeemering, E.S. (2018), "Sustainability management, strategy and reform in local government", *Public Management Review*, Vol. 20 No. 1, pp. 136–153.

Tables

Table 1: Dimensions of the analytics of government

Dimensions	Definitions
Problematisation	Identification of an issue to be governed
Utopian ideal	The aim towards which governance is aimed as well as the belief that governance is made possible by a regime of governing
Regimes of practice	*Visibilities*: created by governance processes and by the use of particular techniques *Mechanisms, techniques and practices*: used to achieve the governance (and which may create visibilities, identities and knowledge) *Knowledge*: which is generated by and used within governance processes
Identities created	Which emerge from and support governance processes

Source: Gouldson and Bebbington (2007) and Dean (1999)

Table 2: Climate change strategy in the small city

Creation of renewable energy resources
1. Creation of wood heat networks
2. Creation of wind turbines
3. Creation of solar panel units
4. Study for a methanization unit
5. Financial assistance for "clean" mobility (electric bikes)
6. Pedagogical discourse on clean sources of energy
7. Town use of electric cars
8. Knowledge creation on renewable energy production

Energy savings
1. Financial assistance for energy savings purchases
2. Pedagogical discourse on energy saving tips
3. Energy saving investments within town buildings and lightings
4. Encouragement of habitat renovation, insulation
5. Study for a new eco district
6. Knowledge creation on energy savings
7. Smart meters

Table 3: Timeline of energy control related events

(E.) *exemplarity,* (F.A.) *financial assistance*, (K.) *knowledge*, (M.) *materiality*, (P.D.) *pedagogical discourse*, (V.) *visibilities*

Time	Regimes of practice	Event
2002	K.	Feasibility study for a wind turbine
2002	P.D.	Program of communication towards the private customers through the town journal
2002	K.	Solar pre-diagnosis concerning the hot water production of the intercommunal swimming pool
2002	K.	A feasibility study for a photovoltaic solar installation on social housing
2002	K.	A study for a mini wood heat network on the site of a school
2003	K.	An energy orientation council
2004	E.	Pilot city of energy management
2004	F.A.	Distribution of energy saving bulbs
2004	K.	Energy control study on the hospital
2004	F.A.	Financial assistance for the purchase of an individual solar water heater
2004-2005	K.	Energy pre-diagnoses with professional customers representing 80% of professional energy consumption
2004-2006	K.	Measurement campaign on 150 customers of the electricity provider
2004-2008	K.	Energy diagnostics on the estate of the department present in the city
2005-2006	P.D.	Neighbourhood meetings to inform citizens
2005	K.	Feasibility study for a photovoltaic solar installation on the roof of as school
2005	F.A.	Financial assistance to buy a more efficient heater
2006	F.A.	Financial assistance to buy an efficient log-burning boiler
2006	K.	Launch of a intercommunal energy council
2006	P.D.	Creation of the website of the electricity provider with information related to energy consumption
2006	F.A.	A programmed home improvement operation
2006	P.D.	Setting up an energy info space
2006	K.	Launch of the study for the construction of a wood heat network
2006	E.	Implementation of actions to reduce the energy consumption of public lighting
2006	E.	The revision of the Local Urban Plan to be able to integrate solar panels and to make the thermal insulation from the outside
2006	E.	Display campaign on public buildings
2006	P.D.	Tool to simulate the potential of photovoltaic production, to verify if an investment is possible
2006	P.D.	Tool to do individual analysis of electric consumption
2007	F.A.	Financial assistance to buy a heat pump
2008	V.	Animation of a conference in a national exhibition on the city project (150 people attended)
2008	M.	Building permit for 4 wind turbines
2008	M.	Start of the wood heating network
2008	M.	Construction of the photovoltaic roof of a school
2008	E.	Vote of a municipal budget for thermal rehabilitation of all schools in the city

2008	M.	Commissioning of the heat network fed by a wood boiler with a photovoltaic power plant on its roof
2008	K.	Carbon emissions assessment
2008	P.D.	Financial assistance to buy an efficient inset fireplace or wood stove
2009	E.	Beginning of the thermal rehabilitation work of one of the schools
2009	P.D.	Flyers incorporated into invoices to inform users in a playful way of the actions of energy savings possible at home
2009	V	Special prize from the jury related to its renewable energy policy integrated within a global policy of energy savings
2009	V.	Special jury prize in a national sustainability exhibition
2009	K.	Operation to collect consumption habits data from 15 households
2010	M.	The wind turbines start to produce electricity
2010	K.	Launch of the study for the creation of an methanization plant
2010	K.	Launch of reflection around positive energy housing
2010	K.	Definition of a basis of work for the creation of an eco-district
2010	V.	Special prize for the wood heat network
2010	V.	3rd prize at the European level for its renewable energy policy integrated within a global policy of energy savings
2010	F.A.	Distribution of Wattson: a appliance allowing you to see via colours if you are consuming more or less than your average energy consumption
2010	K.	Reflexions on the energy positive housing
2011	F.A.	Launch of the financial aid for the electric bike
2011	P.D.	Creation of the Facebook page of the electricity provider with information related to energy consumption
2011	P.D.	Public meeting on thermal renovation and energy savings
2011	V.	Press article in national newspaper on the opening of the wind turbines park
2011	F.A.	Vouchers to purchase items promoting energy savings distributed by the local electricity provider
2012	M.	Extension of the wood heat network
2013	K.	Study for the mega wind turbine project
2013	V.	National Energy Meeting workshop on the town' overall energy strategy
2013	F.A.	Decrease of the municipal tax on electricity from 8.48 to 5% on electricity
2013	V.	Special national honours for the mayor
2013	F.A.	Distribution of dynamo lamp and programmer to citizens
2013	M.	Smart meters that allow users to optimize their consumption and the local electricity provider to optimize their purchases
2013	K.	Consultation on the building of the future (which would be w sustainable development focus start up centre and a training centre)
Along the years from 2001 to today	P.D.	Awareness campaign and assistance to decision-making for all electricity provider customers
Along the years from 2001 to today	P.D.	Electronic billboards to relay information in real time
Along the years from 2004 to today	P.D.	Pedagogical interventions for pupils and students of local schools

Table 4: Data collected

Data source	Quantity
Data collected during the case study by the authors	
Non-participant observation	1 week in July 2013 1 week in October 2013
Interviews	8
Internal documents of the project	10
Internal documents of the local electricity provider	18
Photos	50
Public documents collected about the project	
Current situation and prospects of the project (public documents)	3
Press documents	38
Public videos	3
Public city council meetings transcripts	45
Local electricity provider bulletins	25
City journals	57

Table 5: Visibilities created

Energy savings:

Type of savings	Energy consumption	CO_2 emissions avoided
Public lighting (power reduction gear)	-22% or 27 MWh/year	2800 kg CO_2e /year
Public lighting (new lights)	48 MWh/year	4800 kg CO_2e /year
Thermal rehabilitation of schools	985 MWh that is 58% of prior consumption (estimated)	

Energy Production:

Type of energy production	Substitution of	Production of (MWh th)	Substituted electricity (MWh)	Equivalent of household consumption	Financial impact	CO_2 emissions avoided in tonnes
The two wood heat networks	Gas or fuel	7070	0		-18% of heat cost, 8000 euros saved for the hospital per year	1304
Photovoltaic panels	Electricity		358,4			7,41
Photovoltaic roof on a school	Electricity		16	6		0,396
Photovoltaic power plant	Electricity			25		
Photovoltaic on the roof of the water treatment plant	Electricity or gas		6,6			0,158
Wind turbines	Electricity		18500			990

Table 6: The four mechanisms of governmentality

Mechanisms	Name of mechanism
Pedagogical discourse (P.D.)	
P.D.1	Setting up an energy info space
P.D.2	Awareness campaign and assistance to decision-making for all electricity provider customers
P.D.3	Program of communication towards the private customers through the town journal
P.D.4	Display campaign on public buildings
P.D.5	Facebook page of the electricity provider with information related to energy consumption
P.D.6	Public meeting on thermal renovation and energy savings
P.D.7	Neighbourhood meetings to inform citizens
P.D.8	Electronic billboards to relay information in real time
P.D.9	Flyers incorporated into invoices to inform users in a playful way of the actions of energy savings possible at home
P.D.10	Program of communication towards the private customers through the electricity provider website
P.D.11	Tool to do individual analysis of electric consumption
P.D.12	Tool to simulate the potential of photovoltaic production, to verify if an investment is possible
P.D.13	Pedagogical interventions for pupils and students of local schools
Financial assistance (F.A.)	
F.A.1	A programmed home improvement operation
F.A.2	Financial assistance for the purchase of an individual solar water heater
F.A.3	Financial assistance to buy a heat pump
F.A.4	Financial assistance to buy a more efficient heater
F.A.5	Financial assistance to buy an efficient log-burning boiler
F.A.6	Financial assistance to buy an efficient inset fireplace or wood stove
F.A.7	Vouchers to purchase items promoting energy savings distributed by the local electricity provider
F.A.8	Decrease of the municipal tax on electricity from 8.48 to 5% on electricity
F.A.9	Distribution of dynamo lamp and programmer to citizens
F.A.10	Financial assistance to buy an electric bike
F.A.11	Distribution of energy saving bulbs
F.A.12	Distribution of a appliance allowing you to see via colours if you are consuming more or less than your average energy consumption
Exemplarity (E.)	
E.1	Pilot city of energy management
E.2	Implementation of actions to reduce the energy consumption of public lighting
E.3	Thermal rehabilitation of all schools in the city
E.4	Positive energy housing
E.5	The revision of the Local Urban Plan to be able to integrate solar panels and to make the thermal insulation from the outside
E.6	Consultation on the building of the future
Materiality (M.)	
M.1	Wind turbines
M.2	Wood heating network
M.3	Photovoltaic roof of a school
M.4	Eco-district
M.5	Electric bike
M.6	Mega wind turbine
M.7	Photovoltaic on the roof of the water treatment plant

M.8 Smart meters that allow users to optimize their consumption and the local electricity provider to optimize their purchases

Table 7: Financial assistance

Goal	Financial assistance	Number of
Financial assistance for the purchase of an individual solar water heater	100 Euros per square meter (x2 city+electricity provider)	n.a.
Financial assistance to buy a heat pump	5 Euros per square meter of the housing (x2 city+electricity provider)	13
Financial assistance to buy a more efficient heater	3 or 4 Euros per square meter of the housing	
Financial assistance to buy an efficient log-burning boiler	5 Euros per square meter of the housing	41
Financial assistance to buy an efficient inset fireplace or wood stove	5 Euros per square meter of the housing	
Electric bike financial assistance	10% on a maximum price of 1000 Euros, to be bought in one of the city's bike providers	36

Table 8: Knowledge creation

Year	Type of knowledge	Creation of knowledge
2003	Strategic	An energy orientation council
2003	Technical	Solar pre-diagnosis concerning the hot water production of the intercommunal swimming pool
2003	Technical	Feasibility study for a photovoltaic solar installation on social housing
2004	Technical	A study for a mini wood heat network on the site of a school
2005	Technical	Feasibility study for a photovoltaic solar installation on the roof of as school
2002	Technical	Study of implantation of wind turbines
2006	Strategic	Intercommunal energy council
2006	Technical	Study for the construction of a wood heat network
2010	Technical	Study for the creation of an methanization plant
2010	Habitat	Reflection around positive energy housing
2010	Habitat	Definition of a basis of work for the creation of an eco-district
2013	Technical	Study for the mega wind turbine project
2004-2005	Consumption habits	Energy pre-diagnoses with professional customers representing 80% of professional energy consumption
2004	Exemplarity	Energy control study on the hospital
2004-2008	Exemplarity	Energy diagnostics on the estate of the department present in the city
2004	Consumption habits	Measurement campaign on 150 customers of the electricity provider
2008	Strategic	Carbon emissions footprint
2009	Consumption habits	Operation to collect consumption habits data from 15 households

Table 9: National and international events

Year	National and international events
2008	Animation of a conference in a national exhibition on the city project (150 people attended)
2009	Special prize from the jury related to its renewable energy policy integrated within a global policy of energy savings
2009	Special jury prize in a national sustainability exhibition
2010	Special prize for the wood heat network
2010	3rd prize at the European level for its renewable energy policy integrated within a global policy of energy savings
2011	Press article in national newspaper on the opening of the wind turbines park
2013	National Energy Meeting workshop on the town' overall energy strategy
2013	Special national honours for the mayor

Table 10: Implication of citizens, public entities and other cities

Targets	Governmentality mechanisms
First group	
Citizens	Knowledge creation, pedagogical discourse, financial assistance (materiality and exemplarity)
Municipal workers	Knowledge creation, pedagogical discourse, materiality and exemplarity
Business organizations on the territory	Knowledge creation
Second group	
State, the country EPA	Materiality, knowledge creation and exemplarity
Other cities	Materiality, pedagogical discourse, knowledge creation and exemplarity
Third group	
Pupils from local schools	Pedagogical discourse
Next generations	Materiality and exemplarity

Figures

Figure 1: Visibilities created through the governmentality mechanisms

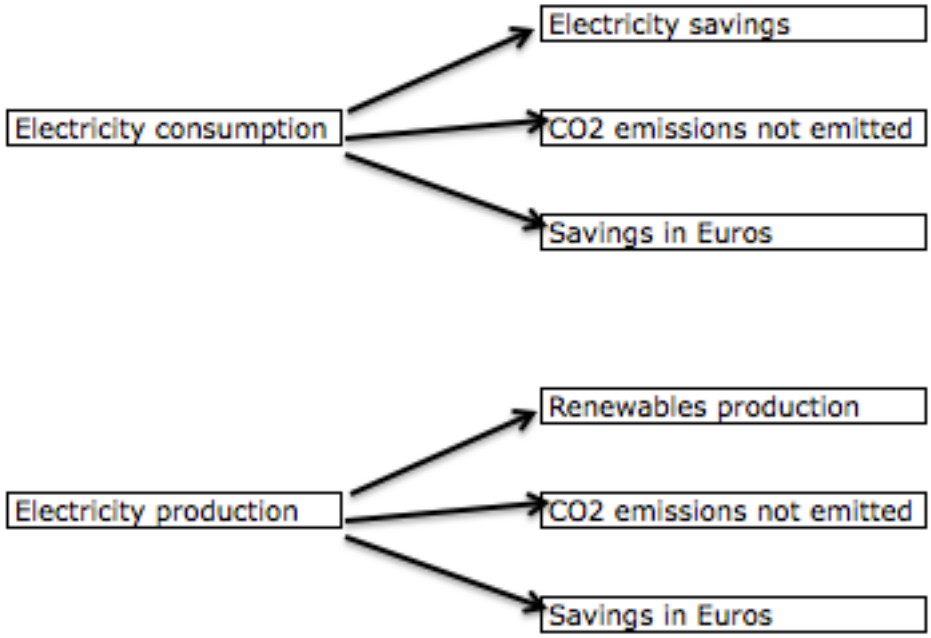


Figure 2: The development of the “good citizen” through government mechanisms

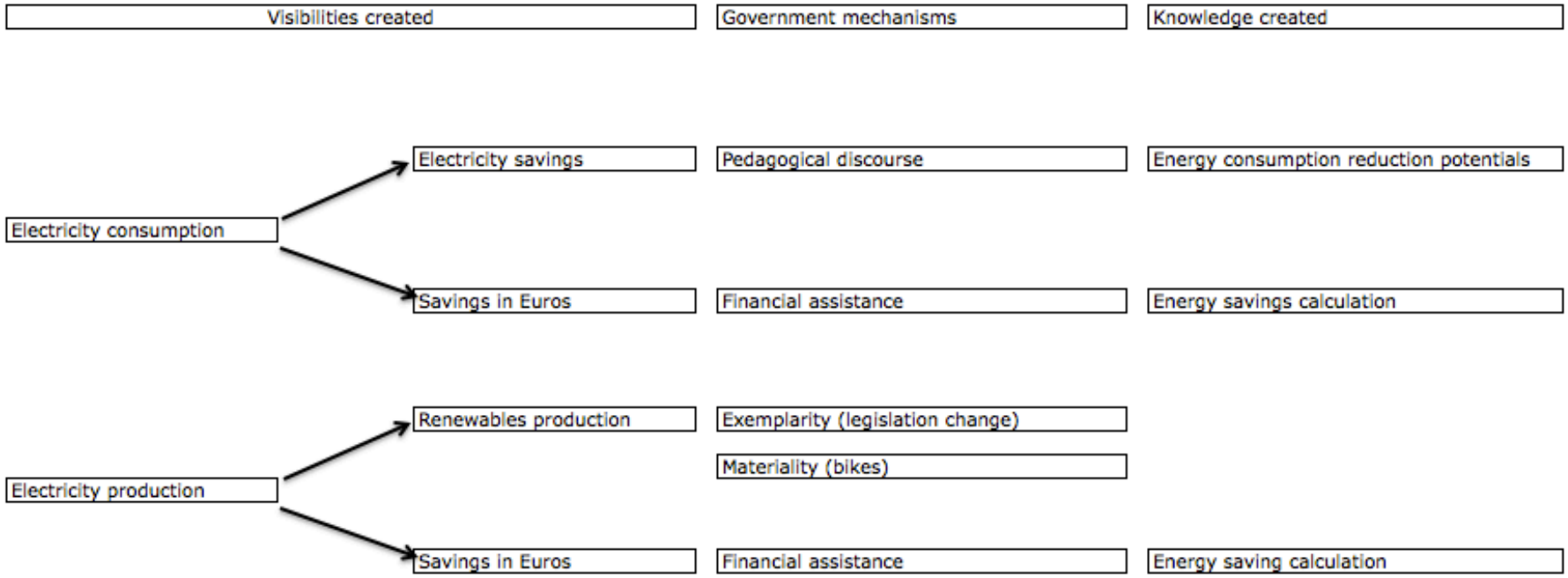
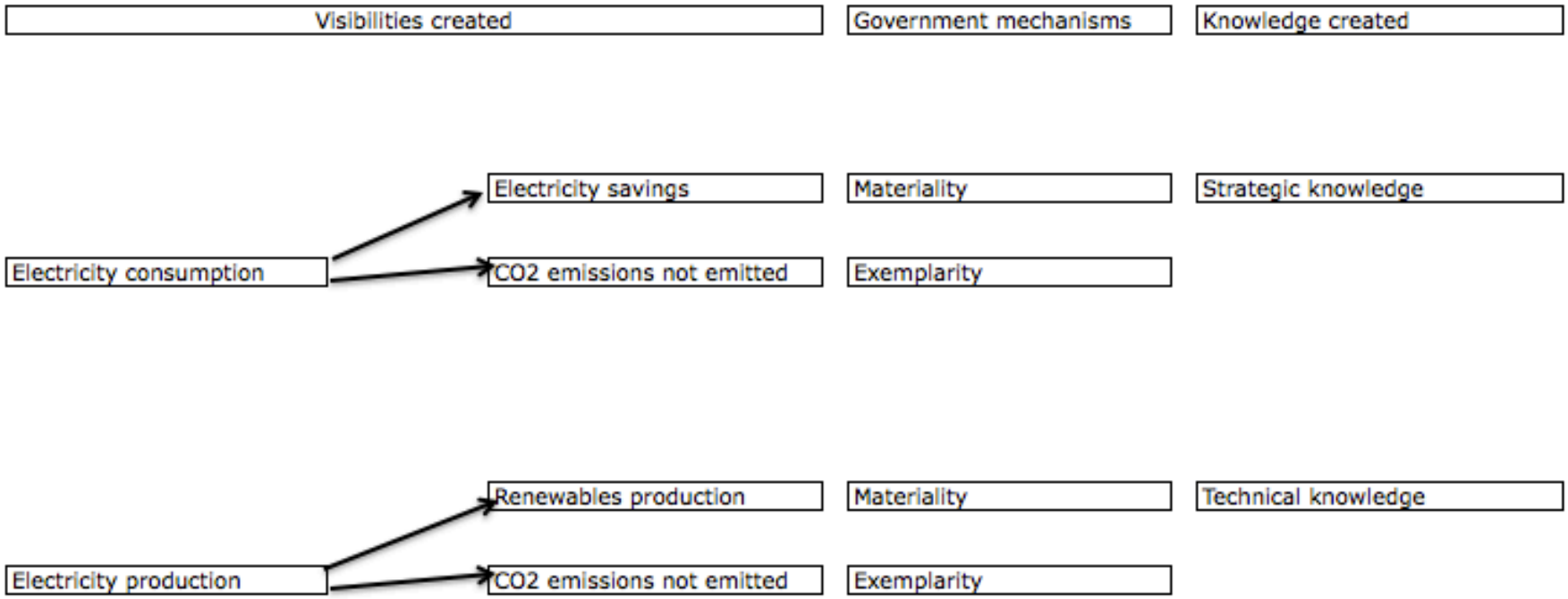


Figure 3: The development of the “model city” through government mechanisms



Images

Image 1: The electronic billboards within the city have messages for the citizens in relation to the energy savings and renewable energy project

Image 2: An electric bike as incentive to switch mobility format

Image 3: Wind turbines installed in 2008

Image 4: Solar panels on the school roof