Energy Policy 81 (2015) 98–105

Contents lists available at ScienceDirect

Energy Policy

journal homepage: www.elsevier.com/locate/enpol

Advanced metering policy development and influence structures: The case of Norway

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HIGHLIGHTS

- Roll-out of smart meters is in Norway coordinated by national regulation.
- Grid companies and related interest organizations has been most influential.
- EU has provided informal pressure on smart meter policy.
- Consumer interests have been less influential in the policy process.

ARTICLE INFO

Article history:
Received 11 November 2014
Received in revised form
23 February 2015
Accepted 24 February 2015
Available online 3 March 2015

Keywords:
Smart meters
AMS
Energy policy influence
Interest structures
Norway

ABSTRACT

Responding to a global trend of installing smart meters Norway has taken a route of full governmental and regulatory coordination. The article maps and analyses the main influences on the developments of Norwegian Advanced Metering policy. Based on 12 interviews and extensive document mapping the Norwegian policy developments are traced from about 1990 to 2014, divided into three phases: Before 2000, between 2000 and 2007, and after 2007. It finds that the main influence and push came from an increasingly united industry sector, fronted by the grid utilities with respective interest organizations. Policy change has been boosted by years of constrained supply, creating incentives for political action. Also developments at the EU level have been important for creating attention for smart meters, while consumer groups have been less influential. The national regulator NVE has adapted its policy process to include external expertise, in particular from the grid companies. The findings confirm that influence into policy processes is a matter of financial and organizational resources and expert knowledge. Of particular policy relevance is the weak organization of private consumer interests into these policy streams, which may be important for further policy development for distributed generation and regulation of private generation activities.

1. Introduction

Norway has, in line with trends in the EU and globally, decided for a full roll-out of smart electricity meters with practically all end users by 2019. This will is centrally coordinated through implementation of an advanced metering (AMS) regulation and installment, adopted in 2011 and 2013. This policy is generally accepted as the next natural step in the development of modern electricity supply systems and towards smart grids (Hoenkamp et al., 2011). This is not least because smart meters provide perceived benefits to most interest groups. While the electricity utilities regard AMS as important for gaining better grid oversight and control that can also guide investment decisions, environmentally oriented NGOs and consumer groups emphasize the potential for monitoring electricity use and saving electricity in private dwellings. In addition it represents a key technology for enabling generation and feeding into the grid from private households. Governments have embraced AMS, valuing the economic factors such as more precise and automatic reading and reporting of consumption as well as the benefits for the customer. Opposition to AMS has been low, save from groups concerned with consumer information privacy. AMS, as a relatively de-politicized and global trend (McKenna et al., 2012) has been endorsed by most stakeholders in Norway, meriting investigation into what it is and where it comes from, as well as who have influenced national policies for AMS. By analysing AMS policy development top-down and bottom-up, this article examines how global and European trends play out in a specific national context, shedding light on what factors influence policies on electricity and green growth more generally, and which factors are likely to be contextual.

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http://dx.doi.org/10.1016/j.enpol.2015.02.027
0301-4215/

Studies on smart meters have focused on consumer behavior and potential for energy savings (Buchanan et al., 2014; Westskog and Wintheer, 2014) consumer acceptance rights and conflicts (Hoenkamp et al., 2011), economic and technical issues in connection with smart meters (Römer et al., 2012; McHenry, 2013). This article adds to the policy oriented part of the smart meter literature (Di Castelnuovo and Fumagalli, 2013; Jennings, 2013) by analysing the political processes and stakeholder influences in the AMS regulatory process in Norway.

The aim is to describe the regulation and characteristics of roll-out of AMS in a mature and early-liberalized electricity market and to explain the shape of the AMS regulation based on streams of stakeholder influence. Through the case of AMS in Norway, this article analyses the main influences on AMS regulation in an organizational field, indicating possible trends within the sector. How was the Norwegian policy on advanced electricity metering shaped, and why did it come about? What have been the main factors of influence?

Following the Third Internal Energy Package adopted July 2009, all EU internal market member states '[…]shall ensure the implementation of intelligent metering systems that shall assist the active participation of consumers in the electricity supply market' (EC, 2009a). This also responds to a global trend, as well as reflecting national context and pressures (Renner et al., 2011). However, the economic feasibility of large-scale AMS roll-out depends on national characteristics of the electricity system; also other factors influence the willingness to implement national AMS regulations, and what form these take. National political dynamics vary among countries (George and Bennett, 2005); Norway's electricity sector was amongst the first worldwide to liberalize, and is today organized as an unbundled and mature electricity market. On the electricity transport side, the Transmission System Operator (TSO) Statnett takes care of the system planning and responsibility. 136 District System Operators (DSO) own and run the district grids and have the legal obligation to roll out AMS for practically all 2.5 million Norwegian end users by 1 February 2019. All transmission and distribution activities are regulated by the Norwegian Water Resources and Energy Directorate (NVE).

2. Methods and theoretical approach

Smart meters, or AMS,[1] are here understood as meters that offer two-way communication that measures consumption at regular intervals, typically hourly or half-hourly (Darby, 2012: 99), as well as including a remote control element. This system can provide accurate information to the consumer and billing for actual consumption, as well as activation and de-activation of supply; it can facilitate limited private household generation of electricity and feeding into the grid through the smart meter (often referred to as 'prosumers', reflecting consumer production) and is generally seen as a necessary step towards smart grids.[2]

An organizational field like the electricity sector is a recognized area of institutionalized life that includes government and industry, as well as other relevant stakeholders (Dimaggio and Powell, 1983). The field is determined by a shared regulatory framework and relatively unified governance structure, with congruent and consistent patterns of domination and sub-ordination (Scott, 2008). Over time, shared values, norms and conventions, will develop within the field beyond the technical requirements of the task at hand (Selznick, 1957: 17). Many organizations, public as well as private, are involved in operating and governing the energy systems in Norway, with actors on the political level (ministries, individual politicians), industry level, and NGOs or consumer interests.

A central assumption is that governance structures develop over time and reflect historically developed patterns. Many of the organizations within the field will contribute to enhance inherited formal structures (Thelen and Streeck, 2005). New issues that lack formal regulations will either remain uncoordinated or be dealt with in line with coordination patterns for similar issues (Boasson, 2011). Thus it is reasonable *to expect that the regulation of AMS in Norway has reflected the pattern of power structures and norms in the electricity sector.*

As an EAA country, Norway is obliged to adopt EEA-relevant directives from the EU, and is an active partner in the EU energy market; therefore, also the European influence will be investigated here. This perspective focuses on the importance of the institutional and political developments at the European level (Fligstein, 2008). Both formal and informal mechanisms may influence EU–Norwegian policy outcomes. European templates for AMS are likely to exert isomorphic pressure on how related regulations develop in Norway; or regulations may be the result of pressure exerted through formal rules from the EU or other European actors (coercive isomorphism), or imitation of dominant European countries (mimetic isomorphism) (Dimaggio and Powell, 1983: 67), or European-level promotion of certain templates for how governments should regulate the sectors (institutional isomorphism) (Börzel and Risse, 2003). We may expect governance structures and policies developed in the Norwegian sector to reflect dominant trends and developments at the European level, reflecting EU policy as well as developments within other European countries, and to be guided by existing European rules and practices (Greenwood et al., 2008; Streeck and Thelen, 2005). Given this perspective, *we may expect Norwegian AMS policy to closely mirror trends and developments at the European level.*

The two theoretical expectations will be tested against the empirical data in the analysis. The empirical data are gathered from official documents, research literature, and not least from high-level, semi-structured interviews. Such a case of policy formation so recent in time naturally follows a logic of process-tracing (George and Bennett, 2005). Thus, the 12 interviewees currently or previously in leading positions in the Norwegian Parliament (Stortinget), the NVE, interest organizations like KS Bedrift and Energy Norway, network utilities and engaged researchers, have proved vital information sources for mapping the processes and empirical data necessary for this study. Admittedly, a full process-tracing approach 'attempts to uncover what stimuli the actors attend to; the process that makes use of these stimuli to arrive at decisions; the actual behavior that then occurs; the effect of various institutional arrangements on attention, processing, and behavior; and the effect of other variables of interest on attention, processing, and behavior' (George and Mckeown, 1985: 35). However, my aim here is more modest; elements of process tracing are included in order to trace the decisions and influences so as to enable analysis of the influences and motivations of the various actors. Empirical data, for example what countries' smart meter policies and EU processes the policy developers and influential stakeholders have related to and been aware of, are mainly derived from the interviewees with supporting information from written sources. All interviews were semi-structured and generally lasted for around an hour or more. Interviewees were allowed to take the initiative, but similar questions were posed to all. All

[1] Various terms are used for advanced or 'smart' meters. While AMS here is understood as two-way communication and reading meters with a remote steering part (limiting flow, switch etc.), Automatic Meter Reading (AMR) or two-way communication meters refer to systems solely for reading or reporting of electricity consumption (Strøm, 2012: 10).

[2] A 'smart grid' is generally understood as a modernized electrical grid that uses information and communications technology to gather information and automatically act on this.