

Local Public Energy Utilities: A Road to Improving Local Energy Security

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Abstract - Local public energy utilities influence the local energy security. On the one hand, their dispersed nature brings them close to citizens. On the other hand, this feature may affect the stability of the energy system. Against this background, the aim of the paper is to delve into the European approach to the issue of the local energy usage.

Introduction

Local public energy utilities have a great potential in terms of increasing the level of the local energy security. This, according to the International Energy Agency (IEA), may be defined as “the uninterrupted availability of energy sources at an affordable price”. Nevertheless, “[e]nergy security has many dimensions: long-term energy security mainly deals with timely investments to supply energy in line with economic developments and sustainable environmental needs. Short-term energy security focuses on the ability of the energy system to react promptly to sudden changes within the supply-demand balance” (IEA).

In this discussion, one may look at energy security at the international and national level, as well as at the local dimension. As far as the local dimension is concerned, energy security relates to the needs of local communities.

This may be done in various ways, but almost all of them are related to improvements of local energy infrastructure (either grid or production units), that very often involves usage of local energy resources. Herein, the local energy utilities are the answer, as they may use local energy resources, produce energy locally, as well as deliver it locally. Because of their dispersed nature, these kinds of sources are among those closest to citizens. Due to their smaller scale of investment, the installation of local energy units is very often quicker and easier, as well as a more sustainable due to the use of renewable fuels.

In light of this, this paper aims at analysing the main European strategic documents and legislation related to the issue of the local energy usage in power units owned by the local governments. The paper juxtaposes them with the circumstances influencing the development of local public energy utilities and their role for the issue of local energy security.

European Resources and Local Energy Sources

There are many indications that the European Union is committed to the development of local energy generation, as local energy units tie together a number of issues like improvements of energy efficiency, growth of renewable energy usage, reduction of greenhouse gases emissions, as well as usage of indigenous energy resources. Particularly, in the context of energy security, this latter element is crucial.

According to the priorities of the May 2013 European Council “[i]t remains crucial to further intensify the diversification of Europe’s energy supply and develop indigenous energy resources to ensure security of supply, reduce the EU’s external energy dependency and stimulate economic growth” (European Council 2013: 4). To enhance energy security, apart from finding new sources of supply, the EU focuses on increasing the usage of its own resources, as it is heavily dependent on external supplies. In 2008 the EU primary energy consumption represented 1800 Mtoe, whereas the EU own energy production covered 850 Mtoe (European Commission 2010b: 13). Moreover, the overall EU import dependency has increased (natural gas +6 p.p and crude oil +3 p.p. between 1995-2012) (European Commission 2014d: 21). Between 1995-2012 indigenous crude oil production decreased from 160 Mtoe to 71 Mtoe (European Commission 2014d: 29). With respect to natural gas production decreased from 200 Mtoe in the late 90ties to the level of below 150 Mtoe in 2012 marking the lowest level since 1995 (European Commission 2014d: 41).

In terms of various kinds of indigenous energy sources, in the EU’s strategic documents on energy one may find that “the most indigenous resource with greatest fuel diversity” is renewable energy (European Commission 2014d: 10). Despite some concerns linked with the variable nature of wind and solar power resulting in challenges in

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terms of their reliability (European Commission 2014d: 10), the EU perceives it as a preferable source of energy. It has an important role to play not only in securing indigenous energy supplies but also in tackling climate change (European Commission 2010b: 13). Decreasing oil and gas production in the EU makes exploitation of indigenous energy sources inevitable, although these sources need to be “sustainable.” Thereby, “[c]ontributions may come from renewable energy sources”. Nevertheless, the EU qualifies herein also “domestic reserves of conventional and unconventional fossil fuels (primarily natural gas) and nuclear according to Member State preferences over their energy mix and within the framework of an integrated market with undistorted competition” (European Commission 2014a: 11).

In the EU, the use of renewable energies in proportion to the total energy consumption has increased from 8.7% in 2005 to 14.1% in 2012 (European Commission 2014d: 163). This means that the EU’s energy produced at local has grown and the dependency on energy imports has decreased. The electricity sector was the main driver for this change of tendency (the share of EU produced renewable electricity increased from 15% to 24% between 2005-2012) (European Commission 2014d: 163).

The share of renewable energy sources (RES) is also influenced by the local energy utilities. “In 2013, German local public utilities had 3000 MW installed RES capacity, which constituted an increase of 32% from the previous year; [i]n Italy, local companies own 2,400 MW in hydro-power plants and 2,500 MW of biomass plants, constituting 13% and 50% of respective installed capacities on national level” (CEDEC 2015: 6). Certainly, apart from the EU policy, the policies pursued at national level have a great impact on this expansion. For instance, the German Energiewende that determined changes for the so-called “Big Four” (i.e. German main national operators) might represent an opportunity for development of the local energy utilities (Schlandt 2015), also those owned by the local authorities.

Naturally, as already mentioned, renewable energy sources are not the only way to improve energy security in the EU. “Many stakeholders agree that Europe should further diversify its energy supply sources and routes, though there is no consensus on the sources with some stakeholders focusing on shale gas, while others note that focus should be on indigenous renewables resources and energy efficiency” (European Commission 2014b: 202-203). However, because of the EU climate and energy policy and its support to the development of renewable generation, stakeholders choose local renewable energy sources as they “increase the security of supply by reducing dependence on imported fossil fuels” (European Commission 2014b:

202-203). Moreover, “NGOs and most of the renewable and non-energy intensive industrial associations, trade unions and companies are stressing that renewables and energy efficiency offer specific advantages in terms of job creation, competitiveness and innovation” (European Commission 2014b: 221). Thus, the new energy scenario of greater European energy independence will not happen without the development of new technologies. “These new technologies are needed to further reduce primary energy demand, diversify and consolidate supply options (both external and indigenous), and to optimise energy network infrastructure to fully benefit from this diversification” (European Commission 2014c: 14). Investments in research and innovation may lead to inventions of new energy storage solutions or improvements in local heating systems (European Commission 2014c: 14).

Adopted by the EU, policy frames open a window of opportunity for local public energy utility. Due to their scale of operation, much smaller than the system sources, they fit into the development of renewable generation. The local public energy utilities may choose between unconventional energy sources to supply a significant part of their energy consumers. With the help of national or European funds, they may finance investments in modernisation of former conventional energy units. Finally, they may benefit from the system of support of renewable energy. Naturally, it does not mean that every local energy source must be of a renewable character, as the Member States can shape their energy mix under the Article 194 (2) of the Treaty on the Functioning of the European Union.

Local public energy utilities also greatly contribute to improvements of energy efficiency. In many European countries (especially Central and Eastern Europe as well as Northern Europe) apart from generating electricity the local energy utilities deliver heat. For instance, in 2013 in Germany, local energy utilities generated one third of their electricity in cogeneration processes; in Austria, 30 TWh of heat and 20 TWh of electricity are annually produced in this way (CEDEC 2015). Moreover, combining heat and power has a potential to significantly increase energy efficiency. Additionally, because of this cogeneration, the combined heat and power (CHP) units emit less greenhouse gases. For example, “[t]he highly-efficient plants reach an efficiency factor of 80-90% and helped to reduce Austria’s CO₂ emission by 4 million tons in 2012 at relatively low cost” (CEDEC 2015).

With or Without Decentralised Energy Systems

Presented circumstances show the possible direction for future development of the decentralised energy systems

in the EU. It is quite clear that this process will be driven by two main factors: the growth of renewable generation and improvements of energy efficiency. The combination of these two drivers will be beneficial. As stated in the sixth recital of the preamble to Directive 2009/28/EC “[t]he move towards decentralised energy production has many benefits, including the utilisation of local energy sources, increased local security of energy supply, shorter transport distances and reduced energy transmission losses. Such decentralisation also fosters community development and cohesion by providing income sources and creating jobs locally.”

Advantages of the decentralised energy systems made them attractive for local communities. Policies to decentralise energy supplies mean that the local governments are consulted more often and have a direct impact upon the type and location of energy units (Johnston 2012). Thereby, “[l]ocal and regional authorities are calling for measures to be adopted at the most appropriate level of government. From their perspective EU energy policy should incentivise and support local sustainable energy production and distribution” (European Commission 2014b: 210).

However, the decentralised energy system does not mean moving away completely from centralised energy systems (or rather central units for the needs of the energy system). These two approaches are complementary; as rightly stated in the EU’s strategy “Energy Roadmap 2050” “centralised large-scale systems such as e.g. nuclear and gas power plants and decentralised systems will increasingly have to work together. In the new energy system, a new configuration of decentralised and centralized large-scale systems needs to emerge and will depend on each other, for example, if local resources are not sufficient or are varying in time” (European Commission 2011: 8). Because the local energy sources are dependent on the internal (breakdowns, repairs, power shortages, etc.) or external factors (unstable powers like wind or sun, increased demand, and so on), there is the need to stabilise each local energy system with the use of central units to support local energy systems whenever it is necessary.

Modern Energy Systems and Smart Cities

Looking at the status of the energy sector one may pose a question: who should be the leader of transitions in the energy system? The European policy approach is based on an active role of the public entities, which should be at the forefront of changes (it does not exclude private stakeholders, but imposes an obligation for public entities). This is confirmed in numerous strategic documents

as well as in the law. For example, as addressed in the strategy “Energy 2020” “[t]he public sector needs to lead by example. Ambitious objectives ought to be set for public sector consumption. Public procurement should support energy efficient outcomes. Innovative integrated energy solutions at local level contributing towards transition to so-called ‘smart cities’ should be supported. Municipalities represent a major actor of the required change, thus their initiatives like the Covenant of Mayors should be further strengthened. Cities and urban areas, which consume up to 80% of the energy, are at the same time part of the problem and part of the solution to greater energy efficiency” (European Commission 2010a: 7).

To support local urban development, the European Commission launched a pan-European project on smart cities, aimed at gathering “the best from the areas of renewable energies, energy efficiency, smart electricity grids, clean urban transport such as electro mobility, smart heating and cooling grids, combined with highly innovative intelligence and ICT tools” (European Commission 2010a: 16). Established in 2011 the European Innovation Partnership on Smart Cities and Communities (EIP-SCC) lists among its ambitions, inter alia, the integration of “local solutions within a European or global market, by aggregating local demand and developing common solutions” (European Innovation Partnership 2013: 19). Such integration of local solutions would foster “a more modular approach to local ecosystem solutions, which can be used in cities throughout Europe, and thus define a European market for smart city solutions, technologies and products” (European Innovation Partnership 2013: 19).

Local public energy utilities, being very close to end-users, are in a very good position for aggregating local demand. Their independence from central government give them possibilities for bottom-up actions covering all mentioned fields, i.e. renewable energy, energy efficiency, smart electricity grids, clean urban transport, smart heating and cooling grids, etc. As they act locally, they take care of local problems like energy poverty of local households or need of energy advice (CEDEC 2015: 6).

Conclusion: Act Local

The development of new energy technologies provides an opportunity to transfer the discussion on energy security to the local level. Thereby, the local public energy utilities play an important role in ensuring energy security of local communities. Building dispersed energy sources, for instance renewable generation, allows local authorities to become more independent from central energy units, and

national energy companies. As a result, they foster competitiveness of firms in the energy market.

Moreover, energy generation that is closer to final users reduces the problem of energy losses in transmission and enables faster rebuilding of the energy system in the event of emergencies. With the possibilities of supplying not only electricity but also heat, they may improve energy efficiency as well as reduce emission of greenhouse gases.

Of course, the development of the local public energy utilities may be difficult, and the local energy sources might not be able to compete with big energy companies. On the one hand, impediments for local public energy utilities may arise: for instance, it might be difficult to capture the full potential of renewable energy; there might be a lack of heat demand; there could be the need to conduct additional, costly investments. Furthermore, it should not be forgotten that the local public energy utilities, as being owned by local authorities, act for the public needs, and an important aspect of their business is meeting the needs of local communities. Among them the energy security exists.

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