

## PANEL 3

### Smart energy systems of the future with a focus on consumers

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#### Introduction

Within the framework of the Energy Union, the EU focuses its actions, *inter alia*, on the development of energy and climate policy to benefit citizens and companies. In this regard, it is inevitable to effectively address the issue of energy poverty and high energy prices. In strengthening the single market and a competitive environment, as well as raising awareness and education of consumers, the Energy Union therefore places emphasis on the importance of developing smart energy systems. They have the potential both to improve the monitoring of prices, as well as directly reduce them.

#### Smart and efficient systems within reach

In doing so, the Energy Union responds to the impacts of energy challenges faced by our society due to the growing concentration of urban populations. The so-called concept of smart cities has, according to the European Commission, the potential to effectively respond to this trend. It is estimated that we could see a 50% reduction in energy consumption, a 20% decrease in traffic and an 80% improvement in water usage.<sup>1</sup>

Smart cities will make use of synergies offered by modern technology and systems used in buildings, electrical equipment, heating and cooling, in the distribution of electricity via smart grids (capable of coping with a shift towards the use of renewable energy sources and with changes in users' energy needs), as well as in transport. However, information and communication technologies will play the lead role. The number of sensors and monitoring devices will considerably increase with even greater focus on virtual databases, whereas the Internet of Things will become irreplaceable.

In the near future, the concrete actions will include installation of smart meters which will give real-time feedback on energy usage and costs and transmit the data automatically to energy suppliers. By 2020, it is expected that almost 72% of European consumers would have a smart meter for electricity while 40% would

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<sup>1</sup> Wim Elfrin. The smart-city solution. Available at <http://www.mckinsey.com/industries/public-sector/our-insights/the-smart-city-solution>

have one for gas.<sup>2</sup> Even more radical changes are to be seen immediately after 2020, particularly in the construction of buildings. According to a Commission directive, EU Member States should make a commitment towards achieving nearly-zero energy consumption in all new buildings built after 2020. The focus on substantially reduced energy consumption is based on the fact that buildings account for 40% of energy supplied.

It is gratifying that European companies are gradually discovering the commercial potential of energy efficiency and savings, while investing more in the development of energy efficient households, smart buildings and electromobility. Through their effort, the European market is seeing a growing presence of radio control systems for buildings which make it possible to control heating, lighting and electrical appliances or devices depending on the selected programme or with the use of sensors (light, thermal sensors, etc.), hand in hand with a growing supply of solar energy storage systems and smart devices which are becoming increasingly available to energy consumers.

### Legislative framework and support

#### **SET Plan**

In terms of legislation, these actions are based on the 2008 European Strategic Energy Technology Plan (SET Plan). It aims to boost the development and use of low-carbon technologies by 2020 while promoting cooperation between EU countries, companies and research institutions which, by pooling skills and facilities, can reduce costs. It also helps to finance projects. The Plan identifies European industrial initiatives where it focuses on the most pressing problems and obstacles and proposes concrete measures for the period between 2010 and 2020. Great attention is given to research in all of the identified initiatives.

On top of that, the Plan emphasises the importance of the development of technologies in their own right and focuses on the use of offshore renewable energy, energy storage and renewable heating and cooling. Further progress is expected to be made in continuing nuclear research, production of fuels direct from sunlight and research into solid-state (digital) light sources and batteries.

#### **Intelligent Energy Europe (IEE) programme**

The innovation programme Intelligent Energy Europe (IEE) represents another strategic framework for promoting energy research and development. Since 2007, it has promoted the market uptake of technologies and tackled non-technological barriers. The programme has pioneered support to “energy transformation” actors such as local and regional authorities, schools, hospitals and social housing as well as addressing the needs of practitioners through training and information provision.

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<sup>2</sup> EC. Commission Report. Benchmarking smart metering deployment in the EU-27 with a focus on electricity <http://eurlex.europa.eu/legalcontent/SK/TXT/PDF/?uri=CELEX:52014DC0356&from=SK>

Investments are expected to generate energy savings of more than 2000 GWh/year. Through its Build-up Skills initiative, the programme is addressing practitioners' needs to build nearly zero-energy buildings across the EU. In the area of energy intensive industries, the CARE+ project mobilised small and medium-sized enterprises in the chemical industry to achieve energy savings of between 10-20%.

### **FP7 and Horizon 2020**

The 7th Framework Programme (FP7) Energy Theme supported hundreds of projects and has also provided substantial support through public private partnerships and financial instruments. At present, its role in supporting research and innovation objectives has been taken over by the Horizon 2020 framework programme as the largest research and innovation programme of the EU. In the period between 2014 and 2015 its financial contribution amounted to more than EUR 9 billion to support energy research (including nuclear), clean transport, climate action and resource efficiency, bioeconomy and key enabling technologies.

The work programmes that have been prepared on its basis (e.g., the Work Programme for 2014–2015: Secure, clean and efficient energy) seek to identify the most important problems within their respective domains and, in addition to analysing them, they also propose solutions and provide estimates of the costs and impacts.

Support at the level of the EU has been provided through the European Institute of Innovation and Technology (EIT) and its Knowledge and Innovation Community InnoEnergy. Substantial additional funding came from the European Energy Programme for Recovery (EEPR) as well as from the New Entrance Reserve (NER) 300 programme.

### **Position of Europe's energy consumers**

The Commission's initiatives which are materialising into concrete outcomes were also welcomed by the European Consumer Organisation (BEUC). In its communiqué of 15 July 2015 it praises the announcement made by the Commission earlier that day about delivering a new deal for energy consumers<sup>3</sup>. BEUC recognises that the new deal makes it easier for consumers to compare offers, switch suppliers and find their way around a digitalised energy market, while also supporting consumers who generate and consume their own energy.

However, BEUC still sees significant gaps in the strengthening of consumer rights and calls upon the Commission to remove them. These include, for instance, unnecessarily complex offers that have been present in the long term, suppressing the options for customers to switch suppliers. BEUC reiterates that EU households were spending 6.4% of their budget on energy use and that consuming self-generated solar energy would be cheaper for 80% of them.

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<sup>3</sup> BEUC: "New Deal for Europe's Energy Consumers" sees light of day BEUC welcomes EU spotlight on consumers in changing energy market. Available at [http://www.beuc.eu/publications/beuc-pr-2015-017\\_energy\\_summer\\_package.pdf](http://www.beuc.eu/publications/beuc-pr-2015-017_energy_summer_package.pdf)

Consumers should therefore be allowed to easily feed excess energy into the electricity grid while facilitating the removal of obstacles to self-generation (most of which are non-technological).<sup>4</sup>

### Conclusion

The combination of decentralised generation and storage options with demand side flexibility can further enable consumers to become their own suppliers and managers for (a part of) their energy needs, becoming producers and consumers, and reduce their energy bills<sup>5</sup> (the so-called “producer-consumer”). It is necessary to realise that consumers should adjust, through demand response, their energy usage and save their money. They should be playing a more active role within the energy system by being able to make simple choices and switch between energy suppliers and producers. On the other hand, with greater rights and opportunities for consumers comes greater responsibility. This, however, cannot be commanded, but rather learnt and developed in practice.

Citizens and companies should be able to benefit from the development of energy and climate policy even as regards ensuring their support and involvement. The issues of energy poverty and high energy prices must be addressed as a priority. Differences in social and economic situation, in energy sector and in the development of the market in energy must be tackled adequately, hand in hand with the fact that different situations in Member States will necessitate different kinds of solutions and instruments.

### Points for discussion:

- Significance of impacts as a result of complying with the commitment of nearly-zero energy buildings after 2020 in terms of the real estate market and socially vulnerable populations.
- An increasing importance of personal data protection with the advent of smart energy systems.
- An increasing risk of cyber attacks through smart networks and smart equipment.
- The issue of energy poverty and concrete actions to tackle this problem.

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<sup>4</sup> Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions. Delivering a New Deal for Energy Consumers. COM (2015) 0339

<sup>5</sup> Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions. Delivering a New Deal for Energy Consumers. COM (2015) 0339