



SET PLAN 2016 - CENTRAL EUROPEAN ENERGY CONFERENCE X

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CONFERENCE REPORT

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PANELS

KEYNOTE SPEECH & PANEL I.

ENERGY UNION: HEADWAY AND CHALLENGES

Keynote speech: Maroš Šefčovič

Panel chair: Pavol Demeš

Panelists: Dušan Chrenek, Alexander Duleba, Maroš Šefčovič, Peter Žiga, Ján Mládek, Konrad Mizzi, Michał Kurtyka, Marku Markkula

Author of the report: Pavol Szalai



SUMMARY

The EC's winter package will bring one percent of GDP growth, 900 thousand new jobs and yearly investments worth 177 billion EUR. **Innovations** transect all initiatives. European energy is changing from a centralized fossil fuel system to a **six Ds model**: decentralized, decarbonized, democratized, diversified, digitalized and disruptive. Following the Paris Agreement, the EC has to make sure that **each country has a plan**. The EC will hold **stakeholder meetings** in parliaments and with consumers and citizens. In 2017, the EC will concentrate on the remaining EEU proposals, mainly dealing with **transport**.

The EEU was a key priority for the **Slovak EU Council Presidency**. Slovakia is seeking to help avoid a gas crisis like that of 2009. A **balanced approach** is needed in relation to all three dimensions – competitiveness, climate, security. Research in energy must continue in all areas including **nuclear energy and smart grids**.

The **Czech Republic** welcomed the fact that the EU's ambition to be world leader in **renewables** does not imply a move away from **nuclear energy**. Nuclear new builds must adhere to safety compliance standards, but the most vulnerable area is **financial resources**. Another problem in Europe is the **electricity flow** between Northern Germany and Southern Germany and Austria. A debate has been launched on balancing **energy security** on one hand and **prices** on the other.

Malta, which holds the current EU Council Presidency, pointed out that **citizens** can relate to energy tariffs or the closure of dirty plants. But they do not understand the **complexity of the EEU**: that has to be explained. It is also time to **formalize regional group**

meetings on energy policy – energy ministers would hold regular meetings.

Poland believes that in pursuing climate objectives we should not neglect **energy security**. Poland is developing **electromobility** – a niche market and an important industrial opportunity.

According to the **Council of Regions**, every **city** should be part of **smart development**; cities are catalyzers and enablers.

KEYNOTE SPEECH

According to the European Commission's VP for Energy Union **Maroš Šefčovič**, the timing of the conference is spot on because the European Commission (EC) published its winter package of legislative proposals at the end of November. The EC has produced **90 percent of the legal proposals** under the European Energy Union (EEU) umbrella.

In 2017, it will focus on the remaining proposals, mainly focused on **transport**.

The EC will work with ministers on the **national energy and climate plans**, which are part of EEU governance. Following the Paris Agreement, it has to make sure that each country has a plan. The EC will hold **stakeholder meetings** in parliaments and with consumers and citizens.

The EC aims to build a **new economic backbone** for the 21st century, based on big data and the close involvement of citizens.

Europe is clearly leading the way. The Paris Agreement would not have happened without the French COP21 Presidency. The Slovak EU Council presidency secured compromises within the EU.

The winter package will bring **one percent of GDP growth, 900 thousand new jobs and yearly investments worth 177 billion EUR**. It not only concerns energy, for without innovations, it would be difficult to achieve the targets. **Innovations** transect all initiatives: energy (renewables, energy efficiency first and consumer needs), transport (advanced biofuels encouraged through a blending mandate, charging points in commercial buildings, cooperative intelligent transport systems), investment in buildings (smart financing for smart buildings), the circular economy (synergies with biomass uses), the manufacturing industry and the digital.

The winter package has **three dimensions**.

The first is the **new regulatory framework**. The EC has proposed a 30 percent energy efficiency target and 27 percent renewables target for 2030 (compared to 1990).

The second comprises the **facilitating measures**. The European Buildings initiative should unlock investments worth 10 billion EUR of public and private funds by 2020 for energy efficiency and renewables in buildings.

The EC has citizens in mind when it legislates. **Up to 50 million Europeans have problems heating and cooling their homes**. The response is higher efficiency and stronger safeguards against automatic disconnections.

Another problem is that **a lot of regions still depend on coal production**. The EC is creating **a new platform** for learning from regions which have undergone this transition to ensure the transition is smooth and to seek out new opportunities for the future.

European energy is changing **from a centralized fossil fuel system to a 6 Ds model**: decentralized, decarbonized, democratized, diversified, digitalized and disruptive.

Šeřčovič **welcomes the SET Plan for facilitating the transition from research to market, especially in offshore wind**. Areas for further thinking include how to work better with industry to achieve goals, how to blend financial instruments for R&I and how to use all innovation results to make European technologies a very strong export.

PANEL DISCUSSION

Slovak Minister of Economy **Peter Žiga** declared that the **EEU was a key priority for the Slovak Presidency**. Slovakia wishes to help avoid a gas crisis like that of 2009.

New EEU governance, energy prices and energy security were the priorities of the **informal meeting of the Council of energy ministers**, which took place in Bratislava in July as part of the Slovak EU Council Presidency. Slovakia also intends to move forward with the new legislation on the *ex ante* control of **intergovernmental contracts** by the EC and launch a debate on the new **energy efficiency** measures.

A **balanced approach** to all three dimensions is needed – competitiveness, climate, security. The EEU should be based on the principles of **subsidiarity and technological neutrality**.

Nuclear energy is of great importance to both Slovakia and the Czech Republic in terms of energy security and reducing emissions, and the EEU should take this into account. Research in energy must continue in all areas including nuclear energy. **Smart grids** are another important research field.

Price regulation in line with European rules is a legitimate form of protection for vulnerable consumers.

Minister of Trade and Industry of the Czech Republic **Ján Mládek** stated that the Czech Republic welcomed the fact that the **EU's ambition to be world leader in renewables does not imply a move away from nuclear energy**. The problem is the potential discrepancy between the goals and actual development. This was also the reason why the Communist regime fell in 1989.

The 2016 European Nuclear Energy Forum showed that the **EU was starting to take nuclear energy seriously**.

The Czech Republic plans to build a **new reactor**, which would be in operation between 2035 and 2095. Nuclear new builds require safety regulations, **but the most vulnerable area is financial resources**. Renewables are subsidized, but nuclear energy has to be self-funded.

The new bloc will be built by ČEZ, a stock market listed company with a daily price tag. However, **given current electricity wholesale prices, the funding falls short**.

The Czech government has **refused to use Contracts for Difference**. This is not because of any doubt about EC approval of state aid, but because of **contradictory nature of Czech public opinion**, which wants nuclear energy, but does not want the state to fund it. The reason for this is the negative experience of renewables in the Czech Republic. One solution may be to **establish a state company**. But in general, nuclear power plants are being built twice as planned for twice the price.

Another problem in Europe is the **electricity flow between Northern Germany and Southern Germany and Austria**. This is forced into Poland and the Czech Republic. Despite this, the Czech government sees future development lying in electricity market integration.

The Czech Republic's problems with gas supply security was solved using "four old pipelines" and the connection to Nord Stream 2 and the spot market. In the Czech Republic, 10 percent of gas is supplied from spot markets and **the notion that all gas should be supplied via long-term contracts, regardless of price**, no longer applies. Mr Mládek questioned whether there is a need for a new gas pipeline on the border with Slovakia and Austria, as currently being debated. The Czech Republic is, however, **interested in having an interconnection with Austria**. A debate has been launched **on balancing energy security on one hand with prices on the other hand**. Connecting the LNG terminals in Swinoujscie, Poland, and in Krk, Croatia, would be a remarkable move, but the cost needs to be considered and should not be borne by the consumer.



(Photo: SET Plan 2016 – CEEC X)

Konrad Mizzi, Matlese Minister from the Office of the Prime Minister pointed out that **citizens can relate to energy tariffs or the closure of dirty plants**, but they do not understand the complexity of the EEU: this has to be explained.

It is also time to **formalize regional group meetings on energy policy** – energy ministers would meet regularly. Such fora should also be open to third countries.

According to the Undersecretary of State at the Ministry of Energy of Poland **Michał Kurtyka**, the **situation is contradictory**: consumers pay high prices, but there is a lack of funding for investment. The challenges are loopholes and sustainability. Pursuing climate objectives should not, however, lead us to neglect **energy security**.

Poland is working on developing **electromobility**: this is a niche market and an important industrial opportunity. It provides a means of developing our auto industry and reducing emissions and dependency on imports.

On nuclear energy, the V4 speaks with one voice.

Marku Markkula, President of the European Committee of the Regions believes energy transition is all about decentralizing energy production. Cities should showcase their best solutions and share these experiences. The Council of Regions has 30 climate change ambassadors. We need to boost smart investment and link it with Horizon 2020 (research). Every city should be part of the smart development; cities are catalyzers and enablers.

KEYNOTE SPEECH & PANEL II.

STRATEGY FOR RESEARCH, INNOVATION AND COMPETITIVENESS**Keynote speech:** Carlos Moedas**Panel chair:** Partrick Child**Panelists:** Charlina Vitcheva, Marianne Haug, John Loughhead, Hervé Bernard, Torbjørn Digernes**Author of the report:** Pavol Szalai**SUMMARY**

The EC has published a **new communication**, *Accelerating Clean Energy Innovation*. According to **Carlos Moedas**, innovation-led growth is not just about fixing a market failure, but also about **setting direction and creating new markets**. In order to correct the market failure, the EC wants, **first of all, to set regulations as policy signals**. Second, correcting the market failure involves **mobilizing private investment**. The EC will at least **double the budget for the InnovFin Energy Demonstration Projects scheme**. To set the direction, Mr Moedas plans to **redirect funds** within the EC's main research fund. For the last three years of Horizon 2020, the EC will put more than **2 billion EUR into four specific areas** that build on the SET Plan priorities: decarbonizing buildings, renewables, storage solutions and electromobility.

Charlina Vitcheva, Deputy Director General of the Joint Research Center, European Commission, elaborated on Moedas' strategy by listing the **technologies which should be funded**: offshore wind, photovoltaic, deep geothermal energy, ocean energy and concentrated solar energy. **Marianne Haug** criticized the EC for **promoting a single type of system for the integration of renewables**, the German one.

The **role of cities**, **John Loughhead**, Chief Scientific Advisor, DECC, UK, believes, should be to raise awareness, but also to participate in convincing people.

Hervé Bernard, Chair of the European Energy Research Alliance wants **more funding for basic research** on materials, including those in the nuclear sector.

Torbjørn Digernes, Chair of the European Platform of Universities in Energy Research & Education called for a **good human resources policy**. We need **smart people**.

KEYNOTE SPEECH

European Commissioner for **R&I Carlos Moedas** presented the European Commission's **new communication**, *Accelerating Clean Energy Innovation*. The transition to clean energy is already happening, but not as fast as required. Climate change and a loss of competitiveness mean we need a renewed sense of urgency.

The thinking behind the new research and innovation (R&I) is that innovation-led growth is not just about fixing a market failure, but also about **setting direction and creating new markets**.

In order to correct the market failure, the EC wants, **first of all, to**

set regulations as policy signals. These should channel both private investment and public subsidies into new technologies. They should also encourage the rise of prosumers: consumers who use, but also produce their energy.

Second, correcting the market failure means **mobilizing private investment**.

The EU can deploy **targeted financial instruments** to lower the risk for private investments in untested but promising clean energy technologies or business models.

Mr Moedas announced that the EC would at least **double the budget of the InnovFin Energy Demonstration Projects scheme**. According



Carlos Moedas (Photo: SET Plan 2016 – CEEC X)

to the communication, the scheme, part of Horizon 2020, is generating strong interest in loans and loan guarantees for first-of-a-kind low-carbon technologies in renewables and fuel cells and hydrogen.

As for **setting the direction**, Mr Moedas plans to **redirect funds within the EC's main research fund**. In the last three years of Horizon 2020, the EC will allocate more than 2 billion EUR to four specific areas that build on the priorities of the SET Plan. These are decarbonizing buildings, renewables, storage solutions and electromobility.

Europe can be a leader in low-carbon technologies, but it needs a new era of **disruptive innovation**.

PANEL DISCUSSION

Charlina Vitcheva elaborated on Moedas' strategy **listing the technologies which should be funded**: offshore wind, photovoltaic, deep geothermal energy, ocean energy and concentrated solar energy.

Member and former chair of the H2020 Advisory group on Energy **Marianne Haug** was more critical. She complained that the EC has become reconciled to the fact that **80 percent of the investment in renewables is outside Europe**. But learning by doing is an innovation policy. It is not enough to look at it as an export policy. If Europe has only 20 percent of the market, **it cannot claim to be a leader**.

Ms Haug also criticized the communication for **promoting one single type of system for the integration of renewables**. She stated that there are three types: the German social choice of solar and wind, bioenergy elsewhere and other kinds. However, Europe seems to be adopting the German option only. We have to have a European strategy. Some will favor the German system, the majority will not.

Another issue which sparked debate at the conference was **the role of cities in the energy transition**. Both Vítcheva and Haugh said cities should raise awareness, but also participate in convincing people. According to Haug, we have to provide cities with grants for pilot projects.

John Loughhead pointed out that we should **have one more objective**

– to make renewable technologies cheaper. If we want to achieve a technological breakthrough, we have to increase the 7 percent efficiency of photosynthesis. Cities and regions provide a specific set of circumstances and can indicate what's realistic and what's not.

Hervé Bernard refocused attention on the issue of research. The EU should **fund more basic research on materials, including those in the nuclear sector**.

Torbjørn Digernes explained that societies can benefit from research if they have a **good human resources policy**. We need to better integrate research and education. Educated people can then make the link between research and industry. **We need smart people**, according to Digernes.

PANEL III.

WORLD ENERGY OUTLOOK

Keynote presentation: Fatih Birol

Panel chair: Ingrid Brocková

Panelists: Tom Howes, Branislav Strýček, Vera Silva, Marek Senkovič, Linda Doman

Author of the report: Pavol Szalai

SUMMARY

Executive Director of the International Energy Agency **Fatih Birol** presented the **World Energy Outlook (WEO) 2016**. Gas markets are undergoing a **second revolution**. The first was the shale gas revolution, and the second is being driven by liquefied natural gas (LNG). **LNG will become the number one way of supplying gas**, overtaking pipelines. This is very **good news for gas importers**.



Fatih Birol Presenting the World Energy Outlook 2016 (Photo: SET Plan 2016 – CEEC X)

As for **energy efficiency**, in the last 25 years global energy demand has increased by 60 percent. Over the next 25 years, it will **increase by 30 percent**, i.e. by half again. **Renewables** are no longer just a romantic story, but a **real business**. We need them to achieve the Paris promise of the 2 degree increase. In oil, we are entering a period of **greater oil price volatility**.

During the panel discussion, Linda Doman said the WEO under-

scores how important **government policies are** for the future of the energy sector. **Vera Silva** explained that Electricité de France relies on a **decarbonized generation mix**. According to **Tom Howes**, WEO is a reference for the EU's own analysis. **Branislav Strýček** pointed out that low electricity prices are a positive message for consumers, but the question is whether we can sustain the **supply of electricity**. **Marek Senkovič** said **the future for the old (fossil) fuels** is bleak. In response, **Slovnaft** will decrease its production of motor fuels and increase its production of chemicals and petrochemicals.

KEYNOTE PRESENTATION

Fatih Birol presented the **World Energy Outlook (WEO) 2016**. According to Mr Birol, today no country is an energy island. What happens in the energy world affects everybody.

Gas markets are undergoing a second revolution. The first was the shale gas revolution, and the second is being driven by liquefied natural gas (LNG).

As for **renewables**, last year new capacity was higher than the capacities of all energy sources put together. Renewables are no longer a romantic story, but a **real business**.

The implementation of the **Paris Agreement will mostly impact the energy sector**.

Concerning **energy poverty**, a billion people still do not have access to electricity. This is a political and social issue.

China is by far the leader in wind, solar and hydropower capacity.

As for **energy efficiency**, in the last 25 years global energy demand has increased by 60 percent. In the next 25 years it will **increase by 30 percent**, i.e. by half again. However, economic growth is projected to remain the same.

The Paris pledges imply a 2.7 degree increase. In order to achieve the promised 2 degree increase, **we need renewables**. The success of renewables has until now been mostly in the power sector. They do not feature enough in **heat and transport**. Policies to support renewables are very weak in these sectors, and growth is much lower than it could be.

Energy security: oil security is important, but there are different

ways of achieving it. The **US will soon be almost independent in importing oil**. The main driver is not domestic production, but efficiency measures for cars and trucks.

We are entering a period of **greater oil price volatility**. In the last two years global oil investments have declined. **The demand side of oil**: we will see oil demand continue to grow, but cars are becoming much more efficient. The growth is **coming from trucks, aviation and the petrochemical industry**. One third of the growth comes from trucks in Asia.

Concerning **the second gas revolution in LNG**, in next five years we will see a huge wave of LNG exports from Australia, Mozambique and Canada. **LNG will become the number one way of supplying gas**, overtaking pipelines.

This is very **good news for gas importers**. They have more options (if they have LNG terminals or interconnections). The mere existence of the LNG option, regardless of actual imports, suffices to increase energy security. Also, a lot more LNG will enter the market, and this means that LNG prices and contracts will begin to favor importers.

There are two **conditions for achieving the 2 degrees goal**. First, by 2020, emissions have to peak and start declining. Second, by the end of the century, emissions have to fall to zero.

PANEL DISCUSSION

Linda Doman of the Energy Information Administration at the US Department of Energy said the **WEO underscores how important government policies are** for the future of the energy sector.

Vera Silva, Program Manager of Electricity Markets & Systems at

EDF explained that **Electricité de France relies on a decarbonized generation mix** based on nuclear energy, but also hydro, wind and photovoltaic energies. Electricity is one of the vectors that will decarbonize heat and transport.

According to **Tom Howes** from DG ENER, European Commission, the WEO is a reference for the EU's own analysis.

Branislav Strýček, Market and Regulatory Director of the Slovenské elektrárne pointed out that low electricity prices are **a good message for consumers**, but the question is **whether we can sustain the supply of electricity**. Renewables are unavoidably part of the future because they are the only resource to receive support. Price signals only come from renewables.

Chief economic advisor to the CEO of SLOVNAFT **Marek Senkovič** said that **the future for the old (fossil) fuels is bleak**. There has been a strong increase in disruptive products and services, e.g. electric vehicles. In the future, Slovnaft will sell kilometers rather than liters. The market will see strong penetration by biofuels, CNG and LNG. There is a demand for cities to be cleaner, and people are being encouraged to use public transportation instead of their own cars. Countries like Norway impose very high fuel taxes. The new, digital generation is bringing new trends with it – an interest in buying services (transportation), rather than products (cars). Sooner or later, all refineries will have to change their business models or close.

In response, **Slovnaft will decrease production of motor fuels and increase production of chemicals and petrochemicals**. Oil processing will not be decreased. Slovnaft will also use its retail infrastructure to provide new services.

PANEL IV.

RENEWABLE ENERGY

Panel chair: András Siegler

Panelists: Diego Pavía, Konstantin Staschus, Eicke R. Weber, Rowena McCappin, Igor Kočiš

Author of the report: Pavol Szalai

SUMMARY

According to the Chief Executive Officer of KIC InnoEnergy **Diego Pavía**, Europe is leading in **renewables**. This is most obvious in **off-shore wind**. In **photovoltaic energy**, where Europe is neither a leading producer nor a leading consumer, it benefits from low prices. It can recover on the added value. The main concern is how to **fund the investment** estimated at 177 billion EUR.

In the next five years, the **photovoltaic market will double**. "Where is Europe?" asked **Eicke R. Weber**, EUREC President and Director of Fraunhofer ISE. Europe can only be a leader when it has the European market.

Igor Kočiš, GA Drilling CEO, talked of developing **geothermal energy**, a new opportunity for Europe to sell its technologies to countries struggling to provide for the **basic needs of their citizens**.



Rowena McCappin (Photo: SET Plan 2016 – CEEC X)

Also, the higher the share of renewables in the electricity mix, the smarter the system. According to **Konstantin Staschus**, ENTSO-E Secretary General, Europe will need **smart grids** for customers to manage consumption.

According to Project Director at Glen Dimplex **Rowena McCappin**, heat pumps allow electricity to be stored in the form of heat. "Smart electric thermal storage" stores energy for future use.

PANEL DISCUSSION

According to **Diego Pavía**, Europe is leading in **renewables**. This is most obvious in **offshore wind**. The levelized cost of electricity (LCOE), a measure of power cost allowing for cross-source comparison, is 5 eurocents per kWh in Europe. Europe has surpassed its goal, which was less than 10 eurocents.

In **photovoltaic energy**, where Europe is neither a leading producer nor a leading consumer, it benefits from low prices. It can recover on the added value. Mr Pavía also mentioned **ocean energy**. Tests showed the LCOE was 16 eurocents per kWh, while the target was at 20.

In the next five years, the **photovoltaic market will double**. "Where is Europe?" asked **Eicke R Weber**. He warned that Europe should not let others distribute its technology. Europe can only be a leader when it has the European market.

Igor Kočiš talked about developing **geothermal energy**. He is working on what he believes is a new opportunity for Europe to sell its technologies **to countries struggling to provide for the basic needs of their citizens** – India, China and African countries. Mr Kočiš called geothermal energy a "sleeping beauty." The major challenges are how to produce and manage it, he said, noting that geothermal has low operational costs.

According to **Mr Pavía**, a **systemic approach and business models**

are needed for renewables in Europe. He said that Europe is good at systems thinking. His main concern is **how to fund the investment estimated** by the European Commission to be 177 billion EUR. "The balance sheets of utilities have been decimated crushed. Who is going to pull?" he asked.

Konstantin Staschus foresees **the cost of renewables** in Europe **decreasing** and **total capacity increasing "enormously"**. As a consequence, Europe will need smart grids for customers to manage consumption. "Yes, you can have demand response without smart grids, but it is going to be hard to make people feel fairly treated," Mr Staschus added.

Mr Weber said the higher the share of renewables in the electricity mix, the smarter the system. In Germany where 35 percent comes from renewables, the power disruption index has been cut from 20 to 12 minutes per year. "The system is smarter, renewables are more secure," said Mr Weber. In France, which relies mostly on nuclear power, the index is 55 minutes.

Rowena McCappin explained "how to make the best out of renewable electricity in buildings." Glen Dimplex's advanced heat pumps allow electricity to be stored in the form of heat. "Smart electric thermal storage" stores energy for future use.

Mr Pavía also said **storage is key to the future of renewables**. "Let's encourage the homogeneity of market rules, it's good for investors," he concluded.

PANEL V.

EFFICIENT ENERGY AND SMART CITIES

Panel chair: Marie Donnelly

Panelists: Roman Chovanec, Brigitte Bach, Claire Roumet, João Torres, Peter Robl

Author of the report: Jan Vitásek



SUMMARY

Roman Chovanec, Head of the Energy Management Department at Municipal Authority of Bratislava explained that **Bratislava**, supported by the European Investment Bank (EIB) through its ELENA scheme and the municipal budget, will monitor **energy performance**, assess potential solutions and support renovations. Distribution system operators (DSOs) can **respond** by deploying **smart grids and digitalization**.

CEO of EDP Distribuição **João Torres** listed the **main challenges** DSOs will have to deal with in order to **keep the system secure and resilient**. DSOs will need to **change** in terms of skills, number of employees, and relations with their stakeholders.

In her contribution, Executive Director of Energy Cities **Claire Roumet** focused on the **transition of cities and municipalities** to a low carbon future. She praised **ELENA**, the EIB assistance program funded out of Horizon 2020, for helping cities to develop transition plans for an energy efficient future, analyze their energy savings potential and design suitable financial tools. However, she stressed that there was a need to **look at partnerships differently**. She insisted that if we want to move to a sustainable system, there was a need to stop talking about stakeholders and **start thinking of everybody as stakeholders** with a view to building a new partnership based on sharing.

According to **Peter Robl** of the Slovak Green Building Council buildings should not only save energy but also be good places to live,

and provide their residents with a **healthy environment**. Mr Robl also pointed to several **legislative issues that were hindering the renovation of buildings**. He complained that the European **accounting standard ESA 2010** was not EPC friendly (Energy Performance Contracting), a method for achieving energy efficiency savings.

Coordinator of the Joint Program Smart Cities at the Austrian Institute of Technology **Brigitte Bach** believes that in the transition to smart cities there is still **low-hanging fruit** that has not been picked yet – an **integrated approach to energy planning**. There is also a need to get citizens and local business engaged. But the real question is how to **put the consumer (and businesses) at the center**.

PANEL DISCUSSION

Roman Chovanec presented **Bratislava's action plan for energy efficiency**. Bratislava set itself a target to reduce greenhouse gas emissions by 20 percent by 2020 in line with commitments agreed by the Covenant of Mayors. Mr Chovanec said the main objectives of the plan were to safeguard secure and reliable supplies of energy for citizens and businesses, reduce greenhouse gas emissions and ensure the cost-efficiency of energy supplies.

The City Council's action plan concerns the **energy efficiency performance of its building stock** as well as **potential energy savings to be made in public lighting**. Bratislava will monitor energy performance, assess potential solutions and back renovations supported by the European Investment Bank (EIB) through its ELENA scheme and the municipal budget. Envisaged measures include insulating buildings, renovating heating systems, smart regulation of public lighting etc.

João Torres listed the **main challenges distribution system operators (DSOs)** have to deal with in order to **keep the system secure and resilient**: distributed generation (where prosumers are beginning to play a role), complexity (as new elements are entering the game), electromobility and smart cities.

DSOs can **respond** to these challenges in **multiple ways**. The first is to deploy **smart grids** – not just smart meters but also other smart elements in the grid. **Digitalization** is also essential but still in its infancy. DSOs will not only need more information from customers and the grid but also investment for its own digitalization. DSOs will also need to engage with customers. DSOs expect to help users control their consumption using data the operators will provide. Among other parts of the puzzle are the **future design of the market** as proposed by the European Commission and **regulatory issues** (such as what tariff should apply to prosumers).

Mr Torres asked how it is possible to regulate something that has been evolving so quickly. Last, but not least, **DSOs themselves will need to change** in terms of skills, number of employees and relations with their stakeholders. Mr Torres believes that in times of rapid change, **cooperation with other stakeholders** (consumers, prosumers, municipalities, regulators, suppliers, technology partners, equipment vendors and other utilities) is essential.

In her contribution, **Claire Roumet** focused on the **transition of cities and municipalities** to a low carbon future. Referring to the Covenant of Mayors, she noted that many cities that have joined this pan-European movement had already achieved their **2020 energy**

efficiency target (to increase energy efficiency by 20 percent) in 2015. Their energy demand was decreased mainly by improving energy efficiency in buildings (26 percent), while progress was less significant in transport (9 percent). But the Covenant of Mayors has already set a **new target for 2030** and has a long term vision to become **carbon neutral by 2050**. Roumet praised **ELENA**, the EIB assistance program funded out of Horizon 2020, for helping cities to develop transition plans for an energy efficient future, analyze energy savings potential and design suitable financial tools. Ms Roumet also supported the idea of a partnership in energy transition.

However, she stressed that there was a need to **look at partnerships differently**. We should move to a system that is completely decentralized, decarbonized and distributed in the sense of wealth distribution, she said. Recalling a comment on cooperation with stakeholders made by João Torres, she insisted that if we want to move to a sustainable system, there was a need to stop talking about stakeholders and **start thinking of everybody as stakeholders** with a view to building a new partnership based on sharing.

Peter Robl stressed that while there was great energy savings potential in buildings, there was also a need to look at **renovating buildings from other perspectives**. More specifically, buildings should not only save energy but also be good places to live and provide their residents with a **healthy environment**. Moreover, adapting buildings to climate change has become important. We need to **protect people from overheating indoor spaces**, Mr Robl explained, adding that buildings should also be equipped with water management systems.

Mr Robl also pointed to several **legislative issues that were hindering building renovations**. He complained that the European **accounting standard ESA 2010** was not EPC friendly (Energy Performance Contracting, a method for achieving energy efficiency savings). Although investment in renovating public buildings is paid for by the contractor under EPC and the public authority will be repaying the investment out of future savings, **investment still appears as a debt in public accounts**, worsening the public authority's fiscal position, he explained.

Brigitte Bach believes that in the transition to smart cities there is still **low-hanging fruit** that has not been picked yet – an **integrated approach to energy planning**. She admitted that the task is difficult, but the earlier cities start planning in an integrated manner, the cheaper it will be in the future, as wrong decisions tend to have **lock-in effects** for the next 50 years. Ms Bach explained that on the technical level there is a need to understand a building's thermal and electric role within the district and how the system will react when a building is renovated. We also need to have **knowledge of the system**: Where are all the energy resources in a system with decentralized production? What does demand look like? The issue is complex and there is a need to involve different academic disciplines, city departments, but also work across sectors. There is also a need to engage citizens and local business. But the real question is how to **put the consumer (and businesses) at the center**. According to Ms Bach, there is a need to look at the added value and to create added value that will inspire business decisions.

PANEL VI.

MARKET INTEGRATION: HARMONIZATION OF REGULATORY FRAMEWORK

Panel chair: Ján Klepáč

Panelists: Alberto Potoschnig, Richard Ružička, Péter Kaderják, Henrich Krejčí

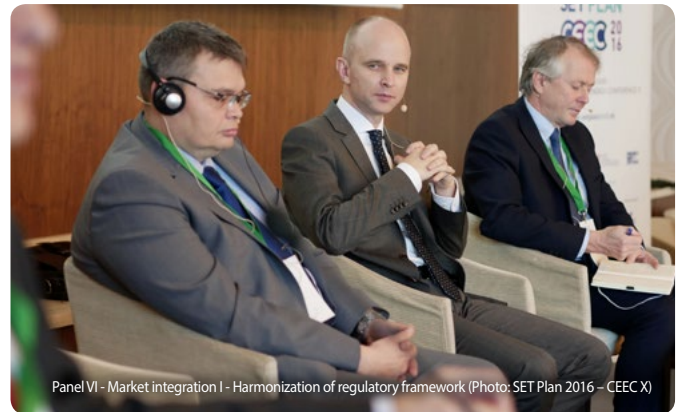
Author of the report: Pavol Szalai

Albeto Pototschnig talked about what he thinks are the **new tasks for the Agency for the Cooperation of Energy Regulators (ACER)**, which he is a director of. It will have to **finalize the Network Code (NC) Proposals** to be submitted to the European Commission and tackle **several decisions** on the terms and conditions of the methodologies for NC implementation, the methodology for the bidding zone review and the methodologies for the European Adequacy Assessment.

Richard Ružička, Director of Natural Gas Regulation at the Slovak Regulatory Office for Network Industries, sees **the role of the office** as being to protect consumers, enforce legal regulation, regulate network industries etc. On a different note, his office is actively involved in several **twining projects** including Azerbaijan, Serbia and Ukraine. It is also concerned with the issue of **energy poverty**. The Slovak regulatory office has conducted a cost-benefit analysis on **smart grids**. There is a price issue: **prices across the EU are incomparable** and this should be fixed by the new Directive.

Henrich Krejčí, Head of Energy Law and Regulatory Affairs at SPP noted that the EU imports two thirds of the gas it consumes and its **dependence on gas imports will grow**. He talked about BP foreseeing the greatest growth in gas in the next 20 years (between 2016

and 2035). According to Mr Krejčí, the **EU should remain a leader in the fight against climate change**. **Gas hub prices are closer than ever in the US, EU and Asia**. Yet, the American price is still twice the European one. From the SPP's point of view, the **European Energy Union is key to energy diplomacy and responding to crisis situations**. Mr Krejčí underlined the fact that the energy market is no longer sufficient anymore to propose gas or electricity; **consumers expect other services** including energy savings.



Panel VI - Market integration I - Harmonization of regulatory framework (Photo: SET Plan 2016 - CEEC X)

Director of Regional Center for Energy Policy Research, Budapest **Péter Kaderják** sees ACER's role improving organically and sensibly, **focusing on cross-border issues and wholesale market integration**. Despite the Visegrad Four's strong political background, **its cooperation has been rather lackluster**, except in its opposition to Nord Stream 2.

PANEL VII.

MARKET INTEGRATION II: EMERGING CENTRAL EUROPEAN GAS MARKET

Panel chair: Pavol Hamžík

Panelists: Peter Fischer, Janez Kopač, Milan Sedláček, Michael Kehr, Piotr Kus, Ielyzaveta Badanova

Author of the report: Adéla Denková

SUMMARY

Peter Fischer, Deputy Director General for Energy & Climate Policy and Export Control, Federal Foreign Office, Germany, said a **realistic crisis scenario regarding security of supply should be elaborated for each member state**. On **Nord Stream II**, the German government has been working on **engaging both Russia and Ukraine** with

the goal of continuing gas transit via Ukraine after 2019, which is an important issue for the whole of Europe.

Janez Kopač, Director of Energy Community Secretariat, Vienna, talked about the **transposition of European rules** by the Energy Community's contracting parties. He stressed he could observe a **very positive trend with Ukraine** having completely transposed and almost entirely implemented the Third Energy Package, and other countries are making good progress as well.

Michael Kehr, Director for Business Development at NET4GAS reminded delegates about the need for **cross-border investments in Europe** to remove regional bottlenecks and facilitate market integration. He also stressed the **need for flexibility**, which will require more **surplus capacity**.

Piotr Kus, Director of the Brussels Office, OGP Gaz-System SA, gave an update on infrastructure projects currently being undertaken by the Polish TSOs Gaz System SA. The **Northern Gate project** concerns an **LNG terminal in Swinoujscie** with a capacity of 5 bcm/year and a **direct connection to the Norwegian continental shelf**. In addition, the **interconnections with Poland's neighbors** will bring more competition into Central and Eastern Europe and increase security of supply as well.

Ielyzaveta Badanova of NJSC Naftogaz Ukraine summarized her **view of the EEU**, which is that it is a project based on the principles of a rule-based approach, equal partnership, transparency in decision making and solidarity, which allows for policy and strategy alignment between various countries. She also said it would be good if the new EU security of supply regulation **embraced the Energy Community** more.



Panel VII - Market integration II (Photo: SET Plan 2016 – CEEC X)

According to Eustream Director for commercial and regulatory affairs **Milan Sedláček**, there are **two drivers behind the changes on European gas markets – the market itself and the European Commission**. The dynamics are going in the right direction, as can be seen for example in the **growing significance of gas-to-gas competition in gas pricing**. The **Eastring pipeline** should also **benefit Ukraine and the Balkan countries**, bringing more competition and security of supply.

PANEL DISCUSSION

According to **Peter Fischer**, the priorities of the **European Energy Union (EEU)** should be completion of the single market rules, development of infrastructure and good management of energy diplomacy. Mr Fischer drew attention to the **German position** on some aspects of the new EU regulation on **security of supply**. The idea of conducting crisis management on a regional basis should be in line with existing energy connections and there should be a **realistic crisis scenario elaborated for each member state**. Efforts to increase gas contract transparency should respect the fact that the Energy Union must be primarily market driven and private companies' sensitive data have to be protected. Mr Fischer stressed that **Nord Stream II** had been prepared by private companies and not the German government. Nevertheless, if the project materializes, the interests of all countries will have to be considered and protected as far as possible. Therefore, the **German government has been working to engage both Russia and Ukraine** in talks on continuing gas transit via Ukraine after 2019, which is also an important issue for the whole of Europe.

Janez Kopač described developments in the gas markets of the

Energy Community's contracting parties. In most countries **gas consumption has been reduced**, especially in Ukraine. **Gas prices are falling steadily**. With the exception of Ukraine, all countries receive the **majority of their gas from Gazprom**. Wholesale market dominance by a small number of companies is still an issue, but the situation is improving. Average transmission tariffs differ vastly from country to country. In the long run, there is great potential in cross-border market integration, but the region still faces the problem of inadequate infrastructure and some markets are isolated. Mr Kopač stressed he could observe a **very positive trend in the transposition of European rules** by the Energy Community's contracting parties, **with Ukraine** having completely transposed and almost entirely implemented the Third Energy Package, and other countries making good progress as well. He also stated that the Energy Community will start transposing gas network codes in March 2017. The region is also waiting for the new EU security of supply regulation which will have to be transposed by Energy Community countries as well.

Michael Kehr reminded delegates of the need for **cross-border investments in Europe** to remove regional bottlenecks and facilitate market integration. He also stressed the **need for flexibility** which promotes market integration under normal circumstances and increases security of supply in times of crisis. To achieve such flexibility, there is a **need to install surplus capacity**, which will not be booked during some periods. This however means that the cost of network development and maintenance is increasing and must be allocated using a fair mechanism and shared among neighboring countries. Mr Kehr described the **Trading Region Upgrade (TRU)**, an instrument being developed in cooperation with Austrian TSOs Gas Connect and TAG, which should enable shippers to upgrade to the right to nominate entry capacity both in the original and the neighboring market.

Piotr Kus spoke about infrastructure projects Polish TSOs Gaz System SA is currently working on. The **Northern Gate project** concerns an **LNG terminal in Swinoujscie** with a capacity of 5 bcm/year (which may be further extended to 10 bcm/year in the future) and a **direct connection to the Norwegian continental shelf** through the existing upstream system in Norway and Denmark, extended by an off-shore pipeline (Baltic Pipe) to Poland. Gaz System is cooperating with Danish and Norwegian partners and expects to have the initial results of a feasibility study at the end of this year or the beginning of 2017. Poland is also working on a number of **interconnections with its neighbors** (Ukraine, Slovakia, the Czech Republic and Lithuania) which are included on the list of PCI projects. According to Kus, these projects will bring more competition into Central and Eastern Europe and increase security of supply as well.

Ielyzaveta Badanova summarized her view of the **EEU** as a project based on the principles of a rule-based approach, equal partnership, transparency in decision making and solidarity which allows for policy and strategy alignment between various countries. She also highlighted two pillars of the **Energy Community Treaty**: non-discriminatory Article 7 and the principle of a single regulatory space. She feels that Article 7 has been underestimated so far in relations between the Energy Community countries and EU members. Ms Badanova also said **it would be good if the new EU security of supply regulation embraced the Energy Community more**.

Milan Sedláček observed that the situation on the Central European gas markets is very dynamic at the moment and that certain aspects of development in the region that were evident in the past

are no longer true. There are **two drivers behind these changes in Europe** – the **market itself** and the **European Commission** with its push for TSOs and market players to integrate and liberalize markets. According to Mr Sedláček, the dynamics are going in the right direction, as can be seen for example in the **growing significance of gas-to-gas competition in gas pricing**, not only in Western but also in Central and Eastern Europe. However, there are still

several challenges connected to for example the **great dependency on one supplier**. Sedláček also said Eustream will have to focus on **sufficient flexibility**, as the Slovak network will have to deal with gas flowing from all directions. The Eastring pipeline is a major project which should enable the utilization of a robust Slovak transit system. This project should also **benefit Ukraine and the Balkan countries**, bringing greater competition and security of supply.

PANEL VIII.

MARKET INTEGRATION III: REGIONAL MARKET-COUPLING IN ELECTRICITY

Panel chair: Matteo del Fante

Panelists: Konrad Purchała, Zbyněk Boldiš,
Manfred Pils, Vsevolod Kovalchuk

Author of the report: Pavol Szalai

Zbyněk Boldiš of ČEPS explained that **market-coupling started 10 years ago** between Germany and France, and the Czech and Slovak Republics followed a couple of years ago. Coupling has progressed, but **we still do not have full integration in Europe**.

Experiences of the process of market-coupling have been **extremely positive**. The **consequences have too**: prices have become less volatile.

Further integration will lead to three options from ČEPS's point of view. The first option is coupling with the Western countries in a multiregional direction. The results are thin. ENTSO-E is helping out. The second is integration with Croatia and Serbia. The third option is to do nothing. **A bottom-up approach** is key to market integration.

Head of Unit Market Management at Austrian Power Grid **Manfred Pils**, said it is ridiculous not to **involve Switzerland in the CORE project**. The European Commission should be persuaded that it makes sense. A CORE governance will be created to coordinate the integration. **The MRC extension** solution is needed for the Visegrad countries as well as for Romania and Croatia.

Market integration leads to an **overall increase in social welfare**. But, as always, the **effect is different in every country**. We need a Europe-wide analysis, but this cannot be provided by a single country. Therefore, it is good that the European Commission's winter energy package gives **more power to the Agency for the Cooperation of Energy Regulators (ACER)**.

Konrad Purchała, Deputy Director, Strategy and International Cooperation, PSE S.A., Konstancin-Jeziorna, stated that **Poland is coupled to the MRC via Sweden and Lithuania**. **Market-coupling leads to better prices**. Market prices are the only way to coordinate the behavior of market participants. In fact they are the cornerstone of the electricity system. Therefore, it is important that they are calculated properly. However, **retail and wholesale prices are distorted by regulation**. Market-coupling should be flow-based.

According to Acting Director of NPC Ukrenergo **Vsevolod Koval-**



Panel VIII - Market Integration III (Photo: SET Plan 2016 – CEEC)

chuk, Ukraine has one of biggest electricity systems in Europe. It connects with Belarus, Russia and Moldova. Burshtyn TPP Island connects with neighboring EU countries but comes under a different regulation and is not integrated with the rest of the electricity system.

As member of the Energy Community, Ukraine has an obligation to implement the third energy package. Ukraine is a net electricity exporter. There are **two ways it could integrate with the EU**: first, via Burshtyn Island; second, via Moldova – at the behest of the Energy Community. In 10 years, Ukraine could be part of ENTSO-E.

During the Q&A, Mr **Boldiš** – speaking about the EC's winter energy package – said the EC should keep its hands off the market. It is very distorted. He thinks the market is like an oval wheel right now – it is better to alter the shape of the wheel than to make the road uneven. It is up to the member states to propose amendments.

According to Mr Pils, under the newly-proposed regulation, **capacity mechanisms** may distort the market even more. **There is a need to regionalize dispatching**.

CONCLUDING AND CLOSING SESSION

Panel chair: Dominique Ristori

Panelists: Peter Plavčan, Jerzy Buzek, Alexander Duleba

Author of the report: Pavol Szalai

During the concluding session, Minister of Education, Science, Research and Sport of the Slovak Republic who is also responsible for the SET Plan portfolio **Peter Plavčan** underscored the **need for research and innovation if the ambitions of the European Energy Union (EEU) are to be fulfilled**. The Slovak government has adopted a strategy for smart specialization.

According to the Director of the Research Center of the Slovak Foreign Policy Association **Alexander Duleba**, the Slovak view of the EEU is securitized. What he has taken away from the conference is that **European countries have different energy identities**, values and cultures. He believes we need to bring them closer. A conference like this one is a perfect opportunity.

Director General of the DG ENERGY of European Commission **Dominique Ristori** stressed that the European Commission's **Winter Package is the biggest energy proposal in EU history**. It comprises eight legislative acts. He believes it is important not to separate one subject from the others. There are **two determinants for success**: a common European regulatory framework and a common European research and innovation strategy.

Jerzy Buzek, Chair of the Committee on Industry, Research and Energy of the European Parliament had **7 points to make about the EEU**: **First, the EEU has five pillars**: security of supply, an internal market focused on smart grids, energy efficiency, the fight against climate change and research – the SET Plan. **Second, research should unite Europe**. **Third, the internal market is a response to the SET Plan challenges**, like tackling renewables, nuclear energy and coal, but also smart grids and the transition from a centralized electricity generation to diversified macro- and self-generation. **Fourth, the SET Plan is especially important for EU's border countries like Slovakia**, which are still vulnerable in terms of security of supply. **Fifth, the EEU should be larger than the EU**; it should contain 36 countries including Ukraine and those in the Western Balkans. **Sixth, concerning the pending legislation in the EU Council on security of supply, markets are good for good times, in crisis we need solidarity**; the approach should be regional; and the *ex-ante* notification of intergovernmental agreements is important. **Seventh, citizens will believe in European integration if they see concrete effects**; a functioning energy market could bring such effects and this should be the long-term goal of the SET Plan.



Concluding session (Photo: SET Plan 2016 – CEEC X)



DINNER SESSIONS

Dinner Session I.

INTERNATIONAL COMPETITIVENESS OF EUROPEAN ENERGY TECHNOLOGIES

Panel chair: Péter Kaderják

Panelists: Jorgo Chatzimarkakis, Ondrej Studenec, Natalie Samovich, Alexander František Zvrškovec

Commentary: Martin Vlachynský

Author of the report: Samuel Goda

SUMMARY

When taken as a whole, the EU is the world's **number one technology exporter**. Many EU countries conduct very robust research and have advanced energy technologies; however, these are **not available on the market**. Is it because of the regulations? Is it because we do not have the right policies or because of the interests of the "big players"? Be it thermal, solar or hydraulic energy, innovation in all these sectors means turning knowledge into profit, which is the core idea of this session. Unfortunately, **innovation and competitiveness will be seriously undermined if the winner has already been chosen at the EU level**.

PANEL DISCUSSION

According to Secretary General of Hydrogen Europe **Jorgo Chatzimarkakis** the future is in renewable **hydrogen technologies**. Storing energy is complicated, but chances should not only be given to batteries.

Secretary of Subcommittee for Energy Policy of National Union of Employers of Slovakia **Ondrej Studenec** said Slovakia has good experiences of **energy efficiency** it can share. However, companies find that the existing regulations are very arduous and complicated.

Natalie Samovich, R&I Programs Manager, Co-founder Solar Demo Platform, Enercoutim, reminded delegates that there is an urgent need for a **European energy market**. This is the internal challenge. The external challenge is to develop a strategy to **promote foreign**



trade. There is a need to help start-ups to access the market. But how can this be done?

President of Dividend Group **Alexander František Zvrškovec** thinks the future lies in **(deep) geothermal energy**. The new technology is aimed at storing energy efficiently, using no explosives. There is a need to **promote smaller energy producers**.

According to the Analyst of the Institute of Economic and Social Studies – INESS **Martin Vlachynský**, we must continue to develop advanced technologies, but we also have to develop a market. Regulating competition is counterproductive. Regulation is also problematic when the winner is chosen from the beginning.

During the **Q&A**, there was criticism that the **issue of standardization** did not feature at the beginning of this session. There is a zero-emissions target, so small businesses should be allowed to reach it. Too much standardization is bad, but something is needed.

We have to **build a market** – industry will go where the market is. The EU has based its market on subsidies and it is collapsing due to the interests of large companies (E.ON) – they slow down the process of market building. EU products are used elsewhere.

Dinner Session III.

TRANSPORT DECARBONIZATION

Panel Chair: Clara de la Torre

Panelists: Peter Badík, Andrea Ricci, Dina Bacovsky

Commentary: Jos Dings

Author of the report: Ján Vitásek

SUMMARY

So far, the transport sector has **not succeeded in decarbonizing**. If we want to change this, we need to stringently internalize the ex-

ternalities. Furthermore, **no low emission technology for the transport sector should be explicitly excluded** from public research and innovation funding. While some propulsion technologies may still need public support to reach break-even point (such as the next generation of biofuels), some technologies, such as electromobility, require better marketing and emotional appeal to attract new customers. Finally, **automation** will change the game in the car industry. While fossil-fuel-related regulatory issues were one-dimensional (lowering CO₂, NO_x etc.), with automated cars regulation will need to be far more complex. There is no place for a patchwork of national policies, the EU will need common guidelines and this will

have to be enforced to create an internal market in electromobility.

PANEL DISCUSSION

The debate concentrated around three major issues: the **role of technology** in the transformation of the transport sector, **consumer acceptance** of new technologies and **framework conditions** for the development of the sector.

ROLE OF TECHNOLOGIES

The panelists agreed that thus far the transport sector has **not been very successful in transitioning to a low-carbon future** and many challenges still need to be tackled. While there is clear potential for pollution to be reduced, none of the low carbon technologies has yet been able to position itself as a serious competitor to traditional fossil fuel combustion technology.



Dina Bacovsky, Member of the supporting team, European Technology Platform Bioenergy (ETIP Bioenergy), believes that with the ongoing R&I that has been making conventional **biofuels more sustainable**, technology has been an important contributor to transport decarbonization. She insisted that there was also great potential in advanced biofuels produced from **residual waste or agricultural and forestry residues**. However, the technology is still in the pre-market phase and is being hindered by several barriers including a **lack of political support**. Unless a strong signal is sent, no one will invest in the technology, Ms Bacovsky said.

According to the Co-founder of GreenWay Infrastructure **Peter Badík**, the mass scale **deployment of electric vehicles** is no longer about the technology. The technology is already there – what is **needed now is better marketing**. Further innovation is needed, though, to exploit the full potential of electric vehicles, Mr Badík insisted. Integrating electric cars and their storage capacity into power grids represents one of the greatest challenges, he said.

In any case, Europe should not close the door on low carbon technologies, Transport Advisory Group ISINNOVA Chair **Andrea Ricci** said. Research policies need to be balanced and must support both incremental and disruptive technologies. They also need to be interdisciplinary and collaborative.

Despite all the low-carbon technologies, it is **digital technologies that will become the real game changer** for the industry, panelists agreed. They can completely change the way people get from one

place to another and shake up traditional business models (Mr **Ricci**). **Energy efficiency** can also be substantially increased with automation, as cars will be able to maintain their distance from one other and avoid accidents (Ms **Bacovsky**).

CONSUMER ACCEPTANCE OF NEW TECHNOLOGIES

Dina Bacovsky believes that consumers are becoming **more and more sensitive to the sustainability** of the technology. They are concerned about the sustainability of biofuels and also of electric vehicles. Although both technologies may equally help to improve carbon footprints, it really depends on how the “fuel” is produced in both cases. Electric vehicles produce zero emissions but if they use fossil fuel generated power, the climate benefits are questionable.

Peter Badík suggested that **the right marketing** can make a difference. The typical automotive advertising plays on emotions. Why do we not play on emotions more when selling electric vehicles? Electric vehicles are not going to win the hearts of consumers on price but on other things, such as **speed, agility or silence**, he said, stressing that SUVs were neither cheaper, nor more practical and yet they had conquered the market.

Andrea Ricci warned that putting **too much emphasis on technology acceptance might be a dead end**. We should ensure that people like the product. Users should therefore be involved in the process of designing new products and services from an early stage.

Jos Dings, Executive Director of Transport & Environment, wondered whether **consumer acceptance was a key issue** at all. In fact, only a minority of vehicles are sold to consumers, while around 80 percent are a B2B business, Mr. Dings claimed. Deployment of the new technology therefore depends much more on the **willingness of manufacturers to invest in the production of sustainable vehicles**, he said.

FRAMEWORK CONDITIONS FOR THE TRANSPORT SECTOR

Andrea Ricci called for a **stringent policy to internalize negative externalities**. He stressed the need to recognize that people had to pay for the negative effects they had been having on the community. For example, a **carbon tax should not really be seen as a “tax”** but as a tool to cover social costs and establish fairness.

In the context of dealing with negative externalities, Mr Ricci stressed that an intersectoral approach to policymaking was vital. **Health policy should become a major policy lever on the transport sector**, he believes.

Peter Badík went on to call for policy makers to **acknowledge the links between transport and health**. Governments need to be honest about it, agree on the necessary measures and implement them, he insisted.

Jos Dings highlighted the role of environmental regulation in the deployment of new technologies and in bringing their prices down. He stressed that regulation was very effective in lowering the cost of compliance. As the next step, **manufacturers should be obliged to produce a certain amount of zero emission vehicles**, he suggested.

It was essential to **create an internal market for electromobility**, Mr Dings stressed, adding that there was a need for **common European standards first**. These standards should ideally be agreed upon by the automotive industry. However, if manufacturers were not able to get a deal, **regulation could prove necessary**, he said.

Dinner Session IV.

SMART CITIES

Panel chair: Francesco Grillo

Panelists: Bernadett Koteles-Degrendele,
Beata Jaczewska, Juraj Hošťák, Zuzana Hudeková

Commentary: Andriy Kyrchiv, Katarína Hazuchová

Author of the report: Andrej Misech

SUMMARY

According to the Advisor to the Italian Minister for Education, Universities and Research **Francesco Grillo**, smart cities are more **energy efficient**, have a **lower footprint for people and places** distant in space and time, and empowers individual and collective capabilities through the **reduction of waste**.

Bernadett Koteles-Degrendele, Smart cities project coordinator at Eurocities thinks smart cities are a **process not an end goal**. Overcoming resistance is difficult, because **public opinion is concerned with fears of job losses and a digital divide**. However, the transformation of cities has to be considered an enabler of change. For Former Deputy Minister of Environment of Poland **Beata Jaczewska**, the narrative is changing from preventing energy poverty to **protecting health** (improving health and well-being) as cities need good air. Expert from Union of Towns and Cities of Slovakia **Zuzana Hudeková** believes that smart cities play a key role within the context of **climate change**. They do so by mitigating its effects. For Smart City Coordinator for CSE Region at InnovEYtion Centre **Juraj Hošťák**, the smart city is a **“test bed” for smart solutions**.

Executive Director of Association of Energy Efficient Cities of Ukraine **Andriy Kyrchiv** commented that **changing the consciousness (attitudes) of people** towards climate and environmental issues is the key to achieving smart cities. For this reason, a **municipal strategy is essential**. Cities are dynamic living organisms and the same approach cannot be used twice. An independent environmental analyst **Katarína Hazuchová** sees a need for **sustainability value** (economic values); to be **reactive** (legislative, compliance, efficiency); and to be **incremental** (renewables, community initiatives...).

PANEL DISCUSSION

Francesco Grillo asked: What – after all – is a “smart city” and what are the key challenges to realizing it? There has been a **significant rise in the number of cities with more than 10 million inhabitants**, from only one in 1980 to 37 in 2015. Globally, cities occupy 2 percent of the land, but host 50 percent of the world’s population. However, the **situation in Europe is rather different**. In theory, there is convenience in “agglomeration,” which increases with economies of scale (and competition) and conversely decreases with congestion (and the cost of pollution).

On the other hand, a **“stupid” city** is one with three levels of city inefficiency: ineffective waste management, ineffective mobility and ineffective housing.

What then is a “smart city” and how can it be measured? A smart

city is more **energy efficient**, has a **lower footprint for people and places** distant in space and time, and empowers individual and collective capabilities through the **reduction of waste**. The **important questions to be answered in this panel** are: How can we measure the smartness of a city? How do we engage public opinion? Should the public administration fund a policy which by definition implies risk, failures and choices (paradox)? Is it true that innovation can save money and that this could even be a good response to economic and financial crisis? How can we overcome the resistance (trade unions, regulation, etc.) the transformation of cities generally engenders due to the loss of jobs, the digital divide etc.?



Bernadett Koteles-Degrendele talked about **Eurocities**, a network of cities (200) throughout Europe with private sector partners. It covers 35 countries and provides cities with the opportunity to network, exchange ideas, share best practices and build partnerships. It is an EU lighthouse project to promote replication and scale up opportunities.

How can we measure the smartness of cities? A smart city is really a smarter city. Most importantly, a **smart city is a process not an end goal**. It is about **improving urban life for people and with people**, as well as finding common challenges rather than copying solutions, because one size does not fit all. Overcoming resistance is difficult because **public opinion is concerned with fears of job losses and a digital divide**. However, the transformation of cities has to be considered an enabler of change.

Beata Jaczewska said smart cities are **about citizens**. The narrative is changing from preventing energy poverty to **protecting health** (improving health and well-being) as cities need a good air. Nevertheless, organizing the NGO sector is a struggle and this has to be improved.

Zuzana Hudeková defined the smart city as being about the **environment, living, mobility, governance, the economy, people**. Smart cities play a key role within the context of **climate change**. They do so by **mitigating** the effects of climate change. One such “mitigating” initiative is the **Covenant of Mayors** launched in 2008, which has more than 6500 signatories. Another approach is adaptation, with the **Mayors Adapt** initiative launched in 2013. Mayors Adapt is a National Platform of the Covenant of Mayors for climate and en-

ergy, concerned with energy decentralization; territorial cohesion; and adaptation to climate change.

Andriy Kyrchiv commented that **changing people's consciousness (attitude)** towards climate and environmental issues is key to achieving smart cities. For this reason, a **municipal strategy is essential**. Cities are dynamic living organisms and the same approach cannot be used twice. A unique approach is required every time; hence we need to adapt a strategy every time. A city is a **good platform for experiments** too. However, not all municipal environments are suitable for experimentation. We have to be **careful with "digital"** things because of the potential security issues. How can we define and measure the smartness of a city? A smart city is about **providing a suitable environment for citizens to live in, with minimal energy requirements and minimal CO₂ emissions**. First, a city needs to join an initiative and then establish an SEA, revise it and adapt it constantly in line with any changes. Cities need to be brave as they often work with limited/no funds and sometimes without public administration.

Katarína Hazuchová sees cities as living, dynamic and complex systems with their own needs and demands. To become smart, cities need innovation, innovative services and create sustainable values. They also need to have a **sustainability value** (economic values); be **reactive** (legislative, compliance, efficiency); and to be **incremental** (renewables, community initiatives...). Is there any sense in small and medium sized towns becoming smart? Is it even feasible? It does make sense and here are some of the arguments

why: traffic can be managed using communication patterns; public space is shared fairly; it is feasible to employ electronic parking and pay-as-you-pollute mechanisms. The cities of the 21st century should be about the **efficiency of the building stock** (refurbishing buildings is essential), **waste management** (self-sufficiency and zero emissions/waste, waste to energy), and using a percentage of local resources. It is also important to **introduce interactive maps, spatial models** etc. into sustainable energy planning.

For **Juraj Hošťák**, a smart city is a **"test bed" for smart solutions**. Investment in technology should be considered the driver of **innovation**. The Internet of Things (IoT) and the Drone Response System (developed at the University of Delft to respond to medical situations) are examples of trends and investments in emerging technologies. The future is smart, with smart homes and smart cities, which are **safe and resilient, as well as green, innovative, digital and environmentally friendly**. To launch the process, cities should have a vision. The **Smart City Index** was piloted in Italy with more than 100 cities, analyzing more than 470 indicators. It employs a **horizontal approach**. The index can be used to access the private sector, companies or public sector/citizens. To identify opportunities for improvement, one has to look for spikes in one area and insufficiencies in another. This can be illustrated by smart parking projects, where **policy level bottlenecks** result in these projects not being implemented in the end.

During the Q&A, the audience criticized the fact that smart cities are being discussed **without citizens**.

Dinner Session V.

NUCLEAR SAFETY AND ENERGY SECURITY

Panel chair: Břetislav Dančák

Panelists: Marta Žiaková, Marc Deffrennes,

Václav Bartuška, Michael Kuske, Takuya Hattori

Commentary: Peter Líška

Author of the report: Tomáš Madleňák

SUMMARY

Developing countries need to **create huge amounts of energy**, while the rest of the world is looking for ways to **decrease CO₂ production**. The **solution** proposed in this session was a **mix of nuclear power** provided by small modular reactors (SMR) and **renewable energy sources**, which would create a stable and reliable energy mix. However, there are **problems with SMRs**. They have not been fully developed and are unlicensed, and the price of energy is unreasonably high when compared with the big reactors of previous decades.

As for the **position of nuclear power in Europe**, where it is still one of the main and most important sources of energy, **the public and politicians have highly antagonistic attitudes**, which the panelist thought was unhelpful. This creates a **hostile environment** making construction, big investments, research and development difficult. That in turn creates **other crises** – like **dwindling human resources** – and even increases the risks related to nuclear energy (because of a lack of adequate human resources and investments in the innovation of the systems).

Europe is also losing pace with the rest of the world and is at risk of becoming dependent on third countries and regions to sustain its own nuclear production.

PANEL DISCUSSION

According to the Chair of the Nuclear Regulatory Authority of the Slovak Republic **Marta Žiaková**, the **last few years have been awful for nuclear in Europe**. And this has been because of the desires of some people, rather than being based on fact and reality. We will not be able to achieve sustainability in energy without nuclear energy.

The main issue with the sustainable nuclear power component of our energy mix is the **long-term operation of nuclear power plants**. Building new plants is not effective, since we have lost the opportu-



nity to build small reactors, which have a lot of advantages, including lower initial costs. Ms Žiaková pointed out that it looks like Europe has missed out on the opportunities, while developing countries have better options for strategically situating small reactors, which are safer and better located, but we have missed out on this.

Another critical issue concerns the **human resources**. We need to set goals high to attract younger generations into the field. Without the prospect of new plants being built and new high points, we will have difficulty attracting and training new specialized experts. Mechanical engineers, electrical engineers, chemists etc. It is having new projects and new ideas that attracts new people. But we gave up on nuclear power and therefore people do not find the idea of becoming a nuclear expert appealing.

Marc Deffrennes, Analyst of the OECD's Nuclear Energy Agency thinks that **at the EU level, the program is anti-nuclear**. Nuclear cannot even be mentioned at the European level. The problem is that things are moving forward in other parts of the world, while we are losing ground. If we do not pursue innovation and development and industrial activity, we may become dependent on other parts of the world when the technology there is more developed.

This is a problem for **the EU because – like it or not – it is still the most nuclearized region in the world**, as a result of history and development. Of the electricity in the EU 25 percent is produced from nuclear energy. We are ashamed of that. Stop bashing nuclear – it is still the cheapest way to produce electricity, said Mr Deffrennes.

There is no need to engage in a large new build program in EU, but **it is important for the industry to keep apace** and be at the helm of the evolution of the energy. And it needs at least minimal political support for that.

The US has decided to invest in nuclear innovation and development because it wants to retain its capacities in nuclear technology, otherwise in 10 years' time the Chinese will be the global leader, and Europe needs to learn from that. Only new projects and new blood can bring new interest. Business and banks and people want to engage in things that are new and sexy, said Mr Deffrennes.

Special Envoy of the Czech Republic for Energy Security **Václav Bartuška** noted that in 2006 two reactors were being built in Slovakia. **Ten years later and nothing has changed** – the two reactors are still being built. But the industry is not in a bad shape. There are **countries that wish to move forward. But each at its own pace**.

They are not cooperating. There is no EU level of cooperation in nuclear power, no European guidelines, no sharing of resources or information, even between countries that are building new reactors (Finland, Hungary, UK). **Europe is not the vanguard of this industry anymore**. It was, but is no longer.

Michael Kuske, Deputy head of Unit D.3, DG Energy, sees the **European Commission (EC) as neutral on the issue of nuclear energy**; it is neither for, nor against it. We cannot dictate the energy mix of any country. We just have **decarbonization targets** – the question of how they should be achieved is left to each country. In nuclear power, we only require **very high levels of safety**. Nuclear safety is the priority. That is the position of the EC and the EU.

According to the Senior Advisor of Japan Atomic Industrial Forum **Takuya Hattori**, most of the EU is very concerned with the Fukushima situation. But **Japan** has no energy sources, no coal, no gas – everything has to be imported. Therefore, **for the next 10 years at least it will have to rely on nuclear power**. It is very reliable, the largest in scale and most available today. It has played a very important role in energy security and reducing CO₂ at a marginal cost.

Economic development and population increase mean that a **higher energy demand is inevitable**. We need to prepare for this and nuclear is one of the options. We have to rely on it. It has many challenges, especially **safety ones**, but the Fukushima experience leads us to believe we can now overcome these challenges.

Human resources, new builds and public acceptance are all issues in Japan and worldwide. Nuclear is the part of the solution to **fight climate change** – it is not a solution in itself, but it is part of it. What causes nuclear catastrophes? asked Mr Hattori. A lack of critical attitude, the safety culture and constant improvements, not shortcomings in the software or hardware.

During the Q&A, Ms Žiaková noted in relation to **SMRs** that **Russia** is building big reactors in areas where they are needed but small reactors in Siberia. Korea is building a small reactor for **Saudi Arabia**. More African countries want them because they suit their needs better. Small reactors provide **flexibility**. Countries can make them part of their energy mix, creating a hybrid system of smaller reactors and renewables. The total capital investment per megawatt may be higher for small reactors than it is for bigger ones, but they play a different role, as part of the co-generation of electricity.

Dinner Session VI.

ELECTRICITY MARKET DESIGN

Panel chair: Livia Vašáková

Panelists: Oliver Koch, Robert Jambrich, Máriaus Hričovský, Maciej Burny, Andrej Hanzel

Commentary: Konstantin Staschus

Author of the report: Adéla Denková

SUMMARY

Oliver Koch presented the main ideas behind the winter package published on November 30th. He stated that it requires the **coor-**

ordinated action of the 28 member states to ensure the functioning of the market. A coordinated approach is more effective and less costly. In the future, the **EU electricity market must be more flexible** and send the right signals to investors. There should be a level playing field for all players, but **coal will have a limited role in the future** and the EU should avoid subsidizing coal.

According to **Central European utility companies**, the winter package must ensure the **market integration of renewable energy sources** and maintain a **technologically neutral approach** to the development of the market. The market is developing quickly and there is a risk that negotiating the winter package will take so long

that at the end of the day, the new rules will no longer be relevant.

Secretary-General of ENTSO-E **Konstantin Staschus** stressed that **one size does not fit all member states** and a top-down approach to organizing the market is not ideal considering the current conditions (including political ones) in Europe. Therefore, the emphasis should be on **natural regional development** when addressing problems in the functioning of the market.

PANEL DISCUSSION

Oliver Koch, Deputy Head of DG ENER Unit B.2 presented the **main ideas behind the winter energy package** published on November 30th. The new electricity market design proposed by the European Commission aims to ensure that **stronger price signals** will motivate power companies and industries into providing demand reserves that can be **invested in generation units or capacity to respond to demand**.



National market rules, like price caps and state interventions, are currently preventing prices from reflecting when electricity is scarce, according to the Commission's draft regulation on the internal power market, part of the winter package. That means member states will have to accept that price caps are going to be removed from the EU electricity market and that **prices may be high at certain times**.

The individual member state or regional markets should also be better integrated, as the current price zones do not always reflect actual scarcity and follow political borders instead, the Commission says. If there is strong demand in one area, **the price should of course be high enough to attract trade** into that area, said Mr Koch. You can organize a market nationally if you wish, but one thing is clear – it will be far more costly. Cooperation is difficult, but there is no alternative, he pointed out.

However, **several member states are losing trust in the price signals** created by the market and have **started creating a capacity mechanism instead**. Under such a scheme, electricity generators or demand response operators are remunerated for keeping their capacities on standby. That should guarantee that enough energy will be available for example at times when solar or wind power

plants are not able to produce electricity. The Commission's DG Competition identified 35 previous, existing or planned capacity mechanisms in eleven member states during a special inquiry it launched one and half years ago.

These countries believe that under the current market conditions with its low wholesale prices, **energy companies need such subsidies**, otherwise they would not invest in their generation capacities. According to critics, the **schemes may fragment the EU single market**, distort competition by favoring certain producers or types of technology, and create barriers to trade across national borders.

Amongst other things, the Commission's proposal is an attempt to address this problem through the **EU-wide harmonization of adequacy assessment**. That should help in assessing whether remuneration is needed to ensure sufficient capacity is available or whether there is enough power that could be imported from another state, for example. This assessment would be carried out by the European Network of Transmission System Operators for Electricity (ENTSO-E) and approved by the EU's energy regulating agency (Agency for the Cooperation of Energy Regulators – ACER).

The EU-wide analysis is extremely important and must not be ignored when a capacity mechanism is being assessed, but we feel **it would be overkill to base decisions on the EU assessment alone**, said Konstantin Staschus.

He stressed that an **increasing amount of electricity is being produced by small-scale installations** controlled at the local level and that the role of demand side response is also rising. Therefore, member states should also be allowed to consider their own smart-grid driven analyses, said Mr Staschus.

Controversies were caused by another proposal included in the fresh electricity regulation. In line with the European Investment Bank's emissions performance standard, **capacity mechanism should not be accessible to newly-built power plants exceeding a benchmark of 550 grams of CO₂ per kWh**. That would mean coal-fired generation capacities could not take part in the support schemes. For the existing power plants, a transitional period of five years after the regulation's entry into force should be established. For coal-reliant countries like **Poland**, this would mean that a **significant part of their energy portfolio would not be profitable to operate**. According to Director of Department for International Affairs of Polska Grupa Energetyczna **Maciej Burny**, the country would face a **significant lack of power generation capacities after 2025**.

Head of Foreign Regulatory Department at Slovenské elektrárne **Robert Jambrich** stressed that in principal we are against any capacity mechanism that is not fully justified. But from a broader perspective, there are different conditions and energy mixes in individual member states and according to current EU state aid rules, a **technologically neutral approach should be always followed**. The emission performance standard could hinder technological neutrality in this instance, he added.

The feeling behind this proposal was that **the capacity mechanism could materialize as subsidies** securing the survival of plants that should otherwise leave the market, explained Mr Koch, adding that this was a political choice by the Commission which had engaged with the proposal at the last minute. This is a package to achieve **decarbonization path by 2030, 2040 or 2050. Coal will play a very limited role by then**. This assumption is not shared by everyone, but it is one of the basic ideas behind the package, Mr Koch also said.



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