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POWER & EMPOWERMENT

THE EU'S ENERGY SECURITY CHALLENGE

Maroš Šefčovič

IT'S rather ironic. Two hundred years have passed since the Industrial Revolution introduced machines to our factories and households. An entire century has elapsed since cars became widely available and national electricity grids were laid down across Europe, allowing every citizen to use electrical appliances. One would expect that energy supply would be secure by 2015—that it would be taken for granted, at least in developed parts of the world like Europe. Well, it isn't (yet).

Anyone from South-east Europe recalls the winter of 2009, when the gas supply was suddenly disrupted. Any driver on the continent or around the world can testify to the high fluctuations in fuel costs. And even if electricity now runs unimpeded through our grids, millions of European households cannot afford its high price.

Energy security in Europe is, therefore, multifaceted—it concerns oil prices and gas dependency, but also our electricity transmission systems. It is about bringing affordable energy to consumers, avoiding or mitigating shortages, preventing the depletion of exhaustible resources, and reducing the negative impact on our environment.

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Energy security is still a hot political topic in 2015, dominating local, national, European, and international politics and policies. The EU imports more than 53 percent of the energy it consumes. The energy bill each year from external suppliers amounts to over €400 billion—we basically import more than €1 billion per day to meet our energy needs.

Maroš Šefčovič *is Vice President of the European Commission and leads the Energy Union project.*

Photo: European Union

Maroš Šefčovič announcing progress on the Energy Union

A secure energy supply is of vital importance to the stability and growth of Europe's economy, as well as the wellbeing of its citizens—hence President Jean-Claude Juncker's positioning of the 'Energy Union' among the top EU priorities for the next five years. The recently adopted Energy Union Strategy aims to provide every European household and business with energy which is secure, affordable and competitive, and sustainable. These three objectives go hand in hand, and are closely interlinked. With this in mind, I will identify the geopolitical, economic, legal, and technical factors which potentially endanger Europe's secure supply of energy, as well as elaborate on the implementation of the Energy Union Strategy to address these challenges.

For the sake of simplicity, we can divide energy consumption into its three basic uses, namely: electric power for industrial and domestic use, transportation, and heating. The three differ not only in their utility, but also to a large extent in the technologies (hence resources) they require. Securing each of the three, therefore, requires facing different challenges and offering different solutions.

ENERGIZING EUROPE

Electricity is produced by generating electric power from other sources of primary energy—both fossil

and non-fossil materials. Yet as part of the global effort to stop climate change, the EU is deeply committed to significantly reducing its greenhouse gas emissions. At the October 2014 European Summit, leaders agreed that the EU should step up its efforts and domestically reduce emissions by at least 40 percent by 2030, compared to 1990.

This decision implies decarbonizing the EU's economy by significantly increasing the share of renewable sources in the energy mix. I am profoundly convinced that this is where the future economy lies. Although renewable sources are clearly a favorable solution with regard to reducing CO2 in our atmosphere, the challenge is that their supply is not as constant as conventional ones; hence, it is less secure. In reality, however, there is no real tension between energy security and sustainability, as I will later explore.

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As for the second objective (affordability and competitiveness), EU companies and households pay on average twice as much as those in the United States when it comes to retail electricity prices. This price difference with other major economies has a major impact on the competitiveness of Europe's industry—and energy-intensive industries in particular. For some, energy costs represent up to 40 percent of overall production costs.

It is therefore up to us—European decision-makers—to ensure solutions have a strong business case, allowing for a stable market for both European energy suppliers and consumers.

Black ≠ Gold

When it comes to transportation, energy security concerns not only a commitment to reduce our level of pollution and find greener solutions which are more secure and reliable. It is also about diversification from *the* one energy source we are currently using: imported oil. Constituting over a third of Europe's energy mix and almost the only energy source in the transport sector, oil imports make our economy extremely vulnerable to shocks in supply and demand.

Oil prices have been fairly low since August of last year, mainly due to excess production combined with lower consumption and increased energy efficiency. This could lead to the wrong conclusion that Europe, being a net importer, could gain from focusing on oil. Yet the high fluctuation in oil prices creates instability. Oil is produced in a limited number of countries—many of which are exposed to significant geopolitical risks. At the time of writing, the oil market is reacting to the Saudi attack on the Yemeni capital with surging prices. Our market is, thus, closely dependent on political (in)stabilities in other parts of the world.

Finally, the question of energy security does not only concern the immediate or medium-term future. It is also about future generations. Estimates vary with regard to the remaining oil reserves on the planet; what is clear is that oil is exhaustible and will be gone within decades if we continue to consume at our current pace. European and global leaders must provide solutions able to hold for longer than a few more years. Since oil is not one of them, decrease in its consumption is ultimately unavoidable. What could replace it will be discussed later in this essay.

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The Warm-Up Exercise

The third major use of energy is heating of houses and buildings. In fact, heating and cooling constitute the largest single source of energy demand in Europe—with the majority of Europe's gas imports being used for these purposes. Similarly to the case of petrol, Europe imports two thirds of its natural gas from external providers—again being highly vulnerable to supply shocks and price changes. In fact, no less than six EU Member States depend on a single external supplier for their entire gas imports.

As if it were not enough that Europe is a net importer of gas, the fact that the majority of gas imported into Europe comes from the Russian Federation renders our economy susceptible to territorial disputes in other parts of the world—such as between Russia and its neighbors. The current crisis with Ukraine, for example, was extended beyond the battlefields and humanitarian catastrophes in the separatists regions of Eastern Ukraine. It immediately threatened Europe's supply of natural gas, which runs through Ukrainian pipelines. In the past few weeks, I worked relentlessly to ensure the supply of Russian gas to Ukraine and into the EU would not be disrupted, in compliance with the "Winter Package." The outcome has been positive so far, yet the geopolitical climate remains highly volatile.

APOCALYPSE NOT NOW

In the previous section I described the great challenges and threats to Europe's secure and steady supply of its crucial energy sources. Confronting these challenges are creative political solutions—the fruits of the enhanced efforts of my project team consisting of 14 other EU Commissioners, all of whom have contributed immensely. I am proud to say that the current European leadership has a solid vision for its energy future.

I have compared the Energy Union to the Coal and Steal Community of the 1950s—an energy alliance which was so crucial that it gave birth to the European Union as we now know it. Of course, back then—Slovakia, my country of origin—was not part of the Coal and Steel Community; it was still behind the Iron Curtain, and any notion of ever joining the West seemed nothing short of science fiction. But the fact that I am writing this piece now as Vice President of the European Commission shows just how powerful and inspiring the original project has been. That is how ambitious the Energy Union is: it has the potential to create a new economy, a new political structure, and a new geopolitical order.

We are aiming not only to ensure our energy supply, but also to undergo an overarching transition into a sustainable economy that creates growth, reduces our environmental footprint, and provides affordable and competitive energy solutions. At the time of writing, the political strategy has been public for less than two months. During this short period, it has been endorsed by the heads of EU Member States' governments and strongly welcomed by the European Parliament, civil society, local decision-makers, academia, and, of course, EU citizens.

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FIRST, 'EFFICIENCY FIRST'

The concept is simple: by reducing its demand, Europe will depend on less energy and therefore will inherently become more secure. That is why we coined the 'Efficiency First' principle as a rule of thumb. It means that before seeking new sources of energy—and scratching our heads about which technology is the cleanest, and which country is the most stable—we first ask ourselves if this additional energy is really needed. Can we not find innovative ways to reduce and better manage our demand, instead of increasing our supply?

In October 2014, the European Council set an EU-level indicative target of at least 27 percent for improving energy efficiency by 2030. The EU is therefore fundamentally rethinking energy efficiency and is now treating it as an energy source in its own right—representing the value of energy saved. As part of the market design review, the Commission will ensure that energy-efficiency technologies and demand-side solutions can compete on equal terms with generation capacity.

The EU has already put in place the world's leading set of measures to become more efficient in our energy consumption. Through energy labeling and eco-design legislation, EU consumers can make more informed energy consumption choices. While all economic sectors must take steps to increase the efficiency of their energy consumption, the Commission will pay special attention to sectors with huge energy efficiency potential—in particular the transport and construction sectors.

Keeping in mind that 75 percent of EU housing stock is energy inefficient, a lot more can and will be done. For example, the Commission will continue to push for standardization, support the national roll-out of smart meters, and promote the further development of smart appliances and smart grids—so that flexible energy use is rewarded. Our studies show that if everyone in Europe used only energy-efficient products, Europe would save the equivalent of Italy's annual energy consumption from 2020 onwards.

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FROM A 'SINGLES MARKET' TO A SINGLE MARKET

The original and fundamental *raison d'être* of the common European market is… a common European market! Back in 1957, the Treaty of Rome set the four founding principles that goods, services, capital, and people should be able to move freely across the EU's internal borders. In many ways, this project has become an unprecedented success: young Europeans growing up these days do not even know what a border control post looks like—and perhaps ask themselves why it ever existed on European soil. They can travel, work, and study

wherever they desire—in any of the 28 Member States. Yet when it comes to cross-border energy supply, the free movement might exist *de jure* but not *de facto*. Indeed, the freedom of goods and services covers energy supply as well. But energy will not cross borders freely as long as the necessary infrastructure is not in place and all players do not adhere to a common set of rules.

There are numerous reasons why a common European energy market is necessary, but what is highly pertinent to this project is the ability of a single market to increase our energy security. The application of European solidarity—enshrined in EU treaties—on the energy market would liberate EU countries from constant risk of supply disruption. They could rely on their neighbors, who could rely on them and theirs in turn. This way, when demand is high on one side of the continent, instead of producing more energy, we would simply redirect energy from wherever supply is high. The abolishment of national reasoning, when it comes to energy, would also save billions of tax-payers' euros currently being spent on redundant infrastructure. For instance, countries will not need to build additional power plants if supply is abundant elsewhere in the EU, beyond their borders.

There are numerous reasons why a common European energy market is necessary, but what is highly pertinent to this policy concept is the ability of a single market to increase our energy security.

Of course, energy flows require a fully functioning, EU-wide energy grid that connects Member States within the internal market. This will help with integrated renewables, promote intelligent energy use, and put an end to disconnected energy 'islands.'

Up to 2020, the EU needs to invest about €200 billion in upgrading and expanding European energy transmission networks, whilst developing adequate, integrated, and reliable interconnections within the EU. This could be counterbalanced by important savings of up to €40-70 billion (annually by 2030) in terms of avoiding generation costs and ensuring more competitive wholesale gas prices.

The EU is not new to such investment, but has accelerated it in light of recent events on its eastern border. At the core of this acceleration stand the so-called Projects of Common Interest (PCIs)—trans-European projects to help create an integrated EU energy market.

In 2013, 248 energy infrastructure projects were identified. And in last year's European Energy Security Strategy, 33 infrastructure projects were identified as essential for improving security of supply and better connecting energy markets.

The recent initiatives to accelerate the market integration of the Iberian Peninsula, as well as Central and Southeastern European gas markets, show the way. Progress has also been made in the Baltic region—which by 2020 will be well interconnected in terms of electricity and gas. It is time to do the same in the 'Northern Seas' region (which covers the English Channel and the Irish, North, and Baltic seas) to improve interconnection and better integrate the large amount of offshore renewables—such as wind—into the market.

The Energy Union has the potential to create a new economy, a new political structure, and a new geopolitical order.

Energy El Dorado

Renewables are neither constant nor stable resources. That is their major constraint and the major challenge in the context of Europe's energy security. But that is not the entire picture. What makes them extremely interesting is the fact they are endless, eternal, replenishable, and even free of charge! The sun doesn't shine every day and the wind doesn't blow non-stop; but when they do, they are the cleanest sources of energy out there. Harnessing these would enable Europe to regain its energy independence and security, because we can produce them ourselves.

The European Union is therefore committed to becoming the world leader in renewable energy—the global hub for developing the next generation of technically advanced and competitive renewable energies. The EU has also set a target of at least 27 percent for the share of renewable energy consumed in the EU in 2030.

European renewable energy companies already employ over a million people, have a combined annual turnover of €129 billion, and hold 40 percent of all patents for renewable technologies. By taking the lead, we have also significantly reduced the costs of new wind and photovoltaic capacity—benefitting everyone's low-carbon energy future. Costs for new wind and photovoltaic capacity have been reduced significantly, due in large part to the EU's commitment in this area. Reform of support schemes to further drive down costs is also well underway.

But there is no room for complacency. In order to achieve the 27 percent target, new solutions must be found. Increasing the share of renewables in the heating and cooling sector also reduces energy

(gas) imports and enhances our energy security. We need to integrate a growing portion of renewable electricity progressively and efficiently into a market that promotes competitive renewables and drives innovation. This requires a new market design, in which energy markets and grids are flexible on both the supply and the demand sides, as well as across national borders.

Technology cannot change the fact that weather conditions vary from one day to the next, and that renewable sources are intermittent. However, technology can help us find efficient ways to conserve energy from renewable sources, better integrate consumer-generated energy into smart grids, and ensure the flow of energy from where it is produced to where it is needed.

The sun doesn't shine every day and the wind doesn't blow non-stop; but when they do, they are the cleanest sources of energy out there.

It used to be said that the sun never set on the British or Spanish empires—simply because they were vast enough to have the sun shining at any given moment somewhere on their imperial holdings. Following the same logic, there is always sunshine or wind somewhere in Europe.

What's left for us to do is to capture enough of this energy and deliver it to wherever it is needed—including where it is not sunny or windy.

This is not yet a reality, but it's not fiction either. It is the vision of emerging technologies to make renewable energy sources more reliable over the coming years. The EU's funding for energy research has therefore been doubled. The Commission will propose a new research and innovation strategy to make sure that new ideas and projects make it to the market quicker. This will also include transport.

Moving Ahead, Consuming Less

The EU's aforementioned responses to its energy security challenges are, of course, highly pertinent when it comes to transport. Efficiency, an integrated market, renewable sources, and research on new solutions are all valid. Yet the transport sector is also unique in some ways from other uses of energy, and therefore merits its own solutions.

For example, considerable fuel savings could be realized by removing barriers to less intensive greenhouse gas modes of transport—such as rail, maritime transport, and inland waterways—and by making these modes both more attractive and cost efficient.

The EU will also take further action to decarbonize the transport sector, which essentially runs on oil derivatives. This will require a gradual transformation of the entire transport system, as well as the increased development and deployment of alternative fuels. Market uptake of such vehicles depends on infrastructure, vehicles, and fuels being rolled out together. This requires us to take further action to promote the swift deployment of the necessary infrastructure—refueling and recharging stations, for instance.

Electrification of transport is important to break oil dependency and decarbonize transport— especially for road (short and medium distance) and rail transport. The EU therefore intends to speed up the electrification of its car fleet and other means of transport, becoming a leader in electro-mobility and energy storage technologies. This requires full integration of electric vehicles in urban mobility policies and in the electricity grid—both as energy consumers and potential storage facilities. This is part of what we call 'Smart Cities:' using technology to increase sustainability at the metropolitan level.

The European Union is committed to becoming the world leader in renewable energy—the global hub for developing the next generation of technically advanced and competitive renewable energies.

Finally, the EU plans to invest in advanced, sustainable, alternative fuels—including biofuel production processes—and in the bio-economy more generally. This will allow us to retain technological and industrial leadership, as well as meeting climate change objectives. The EU will also need to take into account the impact of bioenergy on the environment, land-use, and food production.

It's Getting Hot in Here!

Gas also deserves special consideration due to its significant infrastructure requirements (especially when delivered by pipelines across continents) and geopolitical implications (when exploited by exporting countries for political gain). Constructing the infrastructure to deliver new sources of gas to the EU involves many partners; it is also both complex and expensive. Resolving these issues requires resolute action at the EU level. However, the necessary infrastructure must also be put in place inside the EU, including the possibility of reverse flows, in order to transport gas to where it is needed.

The main objective of the EU when it comes to securing its gas supply is diversification. Every EU Member State should have potential access to at least three different sources of gas. Of course, this sounds much easier in

theory than in practice, since diversification requires massive investments in laying new pipelines. That is why a considerable share of the projects proposed for funding under the EU's Investment Plan for Europe will go to energy infrastructure. For example, the Connecting Europe Facility has earmarked €5.85 billion for such projects.

The Southern Gas Corridor—designed to bring gas from the Caspian region to the EU—is an example of how the EU will enable Central Asian countries to export gas to Europe. It is equally of strategic importance for the EU to develop the Mediterranean area's full potential as a hub for energy trade flows and investment.

The main objective of the EU when it comes to securing its gas supply is diversification. Every EU Member State should have potential access to at least three different sources of gas.

Diversifying supply also means exploring the potential of liquefied natural gas (LNG) to allow for gas imports to Europe from areas not connected to our continent by pipelines—or as back-up in crisis situations, when insufficient amounts of gas are coming in through the existing pipeline system. In Northern Europe, the establishment of LNG hubs with multiple suppliers is greatly enhancing supply security. This example should be followed in Central and Eastern Europe, as well as in the Mediterranean area, where a regional gas hub is in the making.

Increases in LNG trade will help bring world natural gas prices closer together. LNG prices have over recent years been higher compared to pipeline gas, due in particular to high liquefaction, regasification, and transportation costs—as well as higher demand in Asia. In order to address these issues, the EU will look into the necessary transport infrastructure linking LNG access points with the internal market.

All for One and One for All

The EU's trade policy contributes to greater energy security and diversification through the inclusion of energy-related provisions in trade agreements with its partners. Where the EU negotiates agreements with countries that are important from a supply security perspective, the Commission will seek as a priority to negotiate energy-specific provisions contributing to energy security—notably access to resources—and the sustainable energy goals of the Energy Union. In general, the Commission will pursue an active trade and investment agenda in the energy field—including access to foreign markets for European energy technology and services.

Furthermore, the EU will assess options for voluntary demand aggregation mechanisms for the collective purchasing of gas during a crisis, and when Member States are dependent on a single supplier. This would need to be fully compliant with WTO and EU competition rules. Acting as one, the EU will explore strategic energy partnerships with new potential suppliers or transit countries—such as Algeria, Turkey, Azerbaijan, and Turkmenistan, as well as other Middle Eastern and African countries—while further strengthening existing partnerships with Norway, the United States, and Canada.

When the conditions are right, the EU will consider reframing the energy relationship with Russia based on a level playing field in terms of market opening, fair competition, environmental protection, and safety—for the mutual benefit of both sides.

Particular attention will also be paid to upgrading the Strategic Partnership with Ukraine. When the conditions are right, the EU will consider reframing the energy relationship with Russia based on a level playing field in terms of market opening, fair competition, environmental protection, and safety—for the mutual benefit of both sides.

Europe's 'Power' in the World

As illustrated above, the EU is preparing an extensive policy response to the security challenges facing its energy supply, known as the Energy Union Strategy. It is important to keep in mind that a significant transition of an energy market as large as the EU's will have substantial implications for the world market.

A more integrated and better interconnected market offers greater security of energy demand to our global suppliers, together with more stability and predictability. A stronger and more united EU can engage more constructively with its partners, to our mutual benefit.

Energy policy is often used as a foreign policy tool—in particular in major energy producing and transit countries. The 'geo-economics of energy' (a term coined at the 2015 World Economic Forum) has to be taken into account at face value when discussing Europe's external energy policy.

Therefore, the European Union will improve its ability to project its weight on global energy markets. Together with our

major partners, we will work towards an improved global governance system for energy, leading to more competitive and transparent global energy markets.

A COMPREHENSIVE STRATEGY

To conclude, there is no silver bullet to the energy security issue. That is why the European Commission's Energy Union Strategy enshrines a range of actions that must be undertaken. These include active energy diplomacy, a well-connected and integrated energy market and infrastructure network, the development of indigenous sources of energy and boosted regional cooperation, energy Efficiency First, and enhanced research and innovation.

The implementation of the Energy Union Strategy will neither happen overnight, nor will it be done solely in, or from, Brussels. It will require strong cooperation between European Institutions, Member States, national regulators, energy producers, transmission and distribution operators, consumers, regional and local actors, and others.

An integrated and inclusive governance system should enable us to bring together the different strands of energy policy, as well as monitor Member States' progress on the intertwined objectives of the 2030 framework, the full implementation of the internal market, and increased energy security.