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The US–EU Energy Relationship

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Introduction

The geopolitical landscape has evolved rapidly since 2008, leaving countless outdated predictions in its wake. From the global economic recession, the Fukushima Daiichi nuclear accident in Japan, unconventional oil and gas development in the United States, to Russia's annexation of Crimea and destabilization of Eastern Ukraine, technological developments and unexpected events have affected energy mixes and trade flows across the globe. These evolving forces, coupled with changing political and security dynamics, have produced new thinking as well as new assumptions about global energy futures and geopolitical relationships.

These dynamics have initiated a direct and pertinent transatlantic discussion about the future role of energy and its relationship in security and economic arenas, culminating in three principal questions:

- Will the US unconventional energy revolution change America's role in the world?
- Can other countries enjoy a similar energy revolution?
- And can Europe remain competitive with the USA and share the benefits of the new-found US energy abundance?

The pertinence of these questions becomes clear through a comparison of the contrasting energy pictures across the Atlantic. Europe and the USA once shared the energy paradigm of increasing demand, decreasing supply, and energy dependence on imports: the USA has now reversed that trajectory, while Europe has not. Today, the EU is faced with growing energy dependence, rising energy costs, an increasingly

perilous energy security outlook intensified by recent developments in Ukraine, and a consequential fragmentation of policies among member states. Meanwhile, the USA has become the world's largest producer of oil and gas, with already more than 85 per cent energy self-sufficiency, distinctly reframing the domestic discussion on energy security with a novel paradigm of energy abundance.

The EU and the USA have long shared the challenge of confronting climate change and reducing carbon emissions albeit with divergent approaches. Within the EU, for much of the past two decades, strong action to mitigate the effects of climate change has been both a national security and moral imperative, as reflected in the EU's bold 2020 climate framework – its set of ambitious climate targets for 2020, representing the first major step in the EU's effort to reduce greenhouse gas (GHG) emissions by 80 to 95 per cent below 1990 levels by 2050. The USA, on the other hand, has approached climate change as an economic imperative accompanied by oscillating reluctance and political paralysis, as reflected in its unwillingness to ratify the Kyoto Protocol and its half-hearted engagement in climate negotiations, followed by enthusiastic re-engagement and domestic action in recent years.

Transatlantic roles have become less clear. The economic competitiveness aspect of clean energy policies has become more salient to European countries – while, faced with fossil fuel abundance, the USA finds itself no longer undergirded by the same arguments. Both the EU's 2030 climate framework – approved in 2014, the successor to the 2020 framework – and the EU's insistence on an energy chapter in the Transatlantic Trade and Investment Partnership (TTIP) negotiations reflect this change, shifting delicately away from the ambitious 2020 framework climate goals and instead highlighting a palpable push among member states for increased focus on competitiveness and energy security. In the USA, the unconventional oil and gas revolution has left environmentalists searching for new approaches to bolster low emissions technologies and sources. This increasingly looks to be a fragmented campaign consisting primarily of regulatory actions to ensure that the USA can deliver on its climate commitments.

These same dynamic energy market trends are impacting the very basis of domestic policies in the EU, its member states, and the USA, arguably resulting in asymmetrical policies. A stable energy policy requires balance among three key pillars: environmental objectives, economic objectives, and energy security/foreign policy objectives. With Europe's traditional emphasis on environmental objectives and the growing importance of energy security as emphasized by recent developments

in Ukraine, economic objectives (as they relate to energy) have generally received less attention. Historically, for the USA, the economic and security implications of energy have overshadowed environmental objectives. This may no longer be the case: energy security concerns have abated, and the Obama administration is seeking to leave its legacy mark on the climate change agenda by regulatory and executive action.

These dynamic energy market trends are also impacting the global context for transatlantic cooperation. Involving two of the world's largest energy markets, transatlantic cooperation has often focused not only on policies in and between regions, but also on the coordinated efforts that the two regions present to the world – whether through the International Energy Agency (IEA) or other forums – on international energy matters. As the energy stories on either side of the Atlantic become more disparate, coordination has become increasingly challenging, even with such coordination vehicles as the Transatlantic Energy Council. The EU's recent security crisis with its principal energy supplier Russia plus a US administration sympathetic to the problems of climate change have invigorated transatlantic energy cooperation to a certain extent – but the dramatic difference in the energy and economic outlook and approach to energy policymaking in the two regions, on top of more fundamental energy policy struggles at home, challenge robust transatlantic energy cooperation. The transatlantic agenda must shift to reflect the new energy, economic and environmental realities and accommodate new trends, instead of becoming bogged down in dated and intransigent debates. Ideally, efforts at increased market potential through complementary innovation, trade and investment terms for green products and technology, while managing growing external dependencies jointly in a 'transatlantic energy space', should be intensified by strengthening dialogue focused on energy (as opposed to climate alone) or even through broader trade discussions.

This chapter explores the evolving energy story on both sides of the Atlantic. What divides and binds EU and US energy policy? What are the implications of the US unconventional oil and gas revolution for Europe, and can the US experience be replicated? Is TTIP the most effective forum to find common ground and address the competitiveness issues arising from the US unconventional revolution? Environmentally, are the EU and USA sending the right policy messages on energy and a low-carbon green economy? What are the shared energy security interests? With greater understanding of the evolving governmental, non-governmental, and private sector interests in all of these issues, an open and effective transatlantic dialogue can be recaptured.

The US story

The inception of US energy policy as applied over the past four decades can largely be traced back to 16 October 1973 – the date when the Arab oil embargo was imposed. Prior to the 1970s, consistent increases in oil and gas production in the USA had led to a ubiquitous sense of energy abundance. As production peaked in 1970, however, and as demand continued to climb, the production and consumption trajectories became divorced, and a growing void was created – reaching almost a fifth of US petroleum consumption by 1973 – that was being filled by imports (U.S. Energy Information Administration 2014b).

This situation came into sharp focus when, in response to the US delivery of supplies to Israel for the Yom Kippur War, the Organization of Arab Petroleum Exporting Countries (OAPEC) announced its plan to increase the price of oil by 70 per cent (Yergin 2008). The resultant shortages had severe economic impacts, arguably contributing to an extended US economic recession. The embargo further resulted in a policy paradigm shift: from one of energy abundance to one of growing demand and resource scarcity, with scepticism towards import reliance.

This shift has now been reversed. A convergence of factors – including price, regulatory structure, land rights and mineral ownership, technological advancements, and industry make-up – has resulted in unexpected growth in unconventional oil and gas in the USA. Gas production increased by more than 30 per cent between 2005 and 2012, driven largely by unconventional gas ('shale gas') production, returning US natural gas production to peak levels similar to those of the 1970s (BP 2013). Similarly, unconventional oil production has resulted in a decided reversal of the decline in oil production in the USA, adding over 2 million barrels per day since 2011 (U.S. Energy Information Administration 2014b). While this remains below the production peak achieved in the 1970s, total fossil fuels liquids output in the USA (including condensates and refinery gains) exceeds the liquids output¹ of Saudi Arabia and Russia. This increased production of both oil and gas in the USA has contributed to a significant decline in import dependence, from 30 per cent net import share of total US energy consumption in 2005 down to 16 per cent in 2012 (U.S. Energy Information Administration 2014a).

There has been much speculation as to the long-term economic impacts and strategic implications of this surge in production. With the USA on track to become a natural gas exporter, coupled with low natural gas prices in particular, there have been predictions of a manufacturing

renaissance and a new role for the country as an energy superpower. The oil story is newer than the gas story and is more measured. Despite the surge in oil production, the USA has remained a net importer of oil and is thus still firmly embedded in the global oil market. While some have heralded this boom in production as a new economic revolution for the USA, several studies have found significant near-term economic gains with more moderate long-term economic effects (see for instance Houser and Mohan 2014; IHS CERA 2013). The effects on GDP are estimated to be near term and stimulating in the context of the broader US economy, with large economic impacts predicted on the local level where production has surged, and with economic contagion effects in areas without significant production.

The oil price downturn since the middle of 2014, continuing into 2015, has raised new questions about the long-term resilience of US unconventional oil and gas production and the longevity of the attendant economic and strategic benefits. While the resultant impacts on US production are still unfolding, initial predictions have indicated continued growth in the near and medium term. Nonetheless, the heterogeneous nature of US production perpetuates the uncertainty, reflecting persistent questions about the future demand and supply pictures across the global market.

Accompanying the debate over the economic implications of the unconventional oil and gas revolution is a more muddled debate over how best to capitalize on the strengthened US energy security picture. Domestic production has indeed added an extra layer of insulation to protect from supply shocks, but the USA remains fully integrated into the global oil market. In light of this, despite strong domestic rhetoric extolling the security benefits of increased production, the search for a fully formed policy on the foreign and domestic treatment of energy is yet unresolved. The new protection from supply shocks has resulted in some calls to lessen US involvement abroad. Conversely, some see the new US role in global oil markets as having potential for leverage, and thus with more to be gained from involvement abroad. In other words, a dichotomous debate has developed between stability and leverage as an overarching US energy policy. Exacerbating this debate are uncertainties over the anticipated length of production for unconventional oil in particular; despite a robust short- and medium-term forecast, questions still remain about the sustenance of unconventional oil production in the long term.

This policy conundrum is intensified in domestic debates over LNG and crude oil exports. The USA has a history of supporting free market

principles for energy production and trade in particular, but has been dragging its feet when re-examining policies that restrict exports of LNG and crude oil. This hesitancy reflects skittishness about the economic (and political) implications of allowing exports, and a desire to capitalize on the increase in production domestically: a move towards stability. In addition to the market-based reasons for approving exports, however, there is also discussion of using exports strategically, in support of reducing the EU's energy dependency on Russia: an example of a leveraging strategy. The ongoing debate over exports and identifying the proper foreign policy balance more generally is likely to evolve slowly, with the evolution of the production picture itself.

Perhaps most significant for the transatlantic energy dialogue is the paradigm shift in the USA and its impact on the resolve to address climate change. Soon after the turn of the millennium, the move towards a renewables and climate change policy was undergirded by a sense of growing fossil fuel scarcity and rising prices, temporarily catalysing broad acceptance of the need to develop an alternative to expensive oil and gas. This paradigm culminated in a large tranche of economic stimulus funds in 2009 that sought to incentivize green technologies.

However, with the new prospect of energy abundance, the push to develop the green energy agenda has shifted to reflect the market realities of low prices, abundant oil and gas supplies, and the end of stimulus spending. This has had several important effects. First, natural gas is increasingly looked to as a potential climate solution or fossil fuel transition strategy, since it releases fewer harmful emissions as compared to other fossil fuels. In the period between 2010 and 2012, natural gas was credited with lowering US emissions by replacing 'dirtier' coal in power generation. It is interesting to note that the freeing of US coal through the increased use of gas led to an increase of US coal in the international – specifically the European – market where it has been a cheaper source of energy than natural gas. However, while gas is indeed 'cleaner' than other fossil fuels and could be effective as a bridge fuel to a cleaner future, it is important to acknowledge that the existence of more abundant gas alone will not enable significant emissions reduction in the USA over the long term, without additional technology applications (e.g. carbon capture).

The ability of natural gas to penetrate further into the transportation sector and thereby reduce emissions has been another area where resource abundance and climate change goals have converged. While many industries and analysts have identified plausible avenues for gas conversion in heavy-duty vehicles, marine transport, and even rail, EIA forecasts

indicate that it would require a sustained low natural gas price to affect any form of more long-term conversion (U.S. Energy Information Administration 2014a). The push towards greater reliance on natural gas has also been dampened by local environmental concerns associated with the unconventional oil and gas revolution – such as groundwater contamination, seismicity, and methane emissions – that have resulted in drilling moratoria and increased scepticism in some areas.

Second, the US economic and budget woes have exacerbated the hesitancy on climate change action by strengthening the economic arguments against costly climate legislation and regulation and dampening the willingness to invest in renewable and energy efficiency research, development, and deployment of investments including tax incentives. Most of the initial US support for the green energy agenda came via stimulus funds (some USD 80 billion when defined broadly) enacted in 2009 during the first stimulus package and subsequent increased budget levels for fiscal year 2010. However, this commitment to green energy through a large tranche of money was not replicated in subsequent years due to an effort to change the trajectory of the US deficit and long-term debt projections.

Third, concerns over the ability to sustain economic growth combined with a markedly lower energy price situation have only sharpened the political divide among many US energy policymakers, regulators, and industry stakeholders about the ability to reduce emissions in a way that is meaningful in meeting the climate challenge and does not harm the economy. This political divide, a defining feature of the climate debate in the USA, has been exacerbated by the recent price downturn for crude oil. Despite the heated political debate around these issues, renewables growth has remained remarkably strong. Supported by policies and regulations at the state and local level, new marketing and financing arrangements, as well as cost reductions for the technologies themselves, the outlook for renewables penetration in the USA is quite robust.

Accompanying this state and local activity in support of renewables penetration is extensive executive branch engagement on climate action. With the President's climate action plan released in June 2013, the administration has reiterated its support for and dedication to initiatives on climate change as originally outlined in President Obama's second inaugural address. The plan brought three key categories – carbon reduction, adaptation efforts, and international collaboration – under the same umbrella, together with recent regulatory efforts, aligning efforts on the issue more effectively. It also indicated that the Administration would continue to act in its capacity in the face of stalled legislative action (Executive Office

of the President 2013). This willingness to act in a regulatory fashion was particularly featured in the Environmental Protection Agency's draft Clean Power Plan – a proposed rule to cut carbon dioxide emissions from the nation's existing power plants announced by President Obama on 3 August 2015 (Ladislaw et al. 2014). This controversial proposal, likely to result in significant changes in the US electricity sector, would indicate that the administration is seeking to send a greater message – perhaps both a domestic message in establishing the President's legacy, but also an international one as Paris 2015 climate talks loom large. Indeed, these regulatory actions serve as the foundation for the US pledge to reduce emissions between 26 and 28 per cent by 2025.

This regulatory approach would further indicate that the US approach to enforcing environmental objectives is resilient to the oil price downturn in the near term. Despite concerns that abundant oil and gas could undermine efforts to reduce emissions, continued regulatory support would indicate otherwise. Nonetheless, questions remain about the persistence of these policies under a new administration.

In conclusion, a close analysis of current energy policy in the USA would indicate that, simply put, the country does not quite know exactly what to do with its sudden energy abundance. It is clear that the surge in production brings economic, security/strategic, and emissions benefits at some level, but how to respond to these changes in terms of policy is not entirely clear. This new paradigm has resulted in a need to recalibrate the approach to energy, specifically in a more active domestic debate on the topic of both natural gas and crude oil exports. A combination of WTO obligations and a historic support for free market principles would indicate that continued limits on exports could harm the USA on the global stage in the long term. Further, while the unconventional revolution undermined the argument of fossil fuel scarcity that had been bolstering action to combat climate change, several recent moves by the Obama administration have restructured and re-emphasized support for climate change initiatives – further intensifying the domestic political debate on the country's energy and climate policies, but positioning the USA to take a leadership role in international climate negotiations.

The EU story

Prior to 2005, the energy trajectory of the EU closely mimicked that of the USA. Europe, too, was heavily affected by the Arab oil embargo of 1973, and worked to establish programmes to limit the effects of similar

potential market distortions in the future. As in the USA, countries invested in technologies to increase domestic/regional production and to develop alternative fuels. The EU was also instrumental in establishing the IEA, an autonomous organization within the OECD that was tasked with providing the international architecture to respond to unexpected supply disruptions. Perhaps most importantly, the EU sought to harmonize its disparate and varied energy sectors and markets, and diversify sources and suppliers to satisfy its energy needs: particularly to Russia.²

In recent years, domestic EU energy production has been falling, resulting in greater dependence on external suppliers (European Commission 2013). UK North Sea oil, for example, is rapidly declining due to a combination of factors – a situation mirrored by several other European fields (Bloomberg 2013). EU coal production in 2012 was only about 33 per cent of what it had been in 1990, due in part to GHG emissions reduction goals as well as declining government subsidies (Eurostat 2013b). This has resulted in an overall increased dependence on imports, reaching 54 per cent in 2011 (Eurostat 2013a). Russia has become the primary supplier of fossil fuel imports – the EU depends on Russia for 33 per cent of its crude oil and 25 per cent of its natural gas consumption (European Commission 2014; Eurostat 2014; Godzimirski 2014). Meanwhile, European Economic Area-member Norway supplied 29.4 per cent of gas imported to the EU in 2013. More to the point, the European Commission found in a 2013 report that energy import dependence for solid fuels had increased from 24.4 per cent in 1995 to 41.4 in 2011, and gas dependence had increased from 43.5 to 67 per cent over the same time period (European Commission 2013: 22).

The EU member states have taken several steps to lessen this strategic vulnerability. Traditionally, energy policy has remained squarely in the capacity of the individual states, with member states choosing to retain sovereignty over a sector that is critical for national and economic security. In the past several years, member states have increased cooperation and transferred limited sovereignty through efforts to integrate and liberalize the internal EU energy market, thus attempting to balance dependence across all states. Most notably, several Central European member states – including Romania, Slovakia, Hungary, the Czech Republic, and Poland – have been investing in international interconnector pipelines with reverse flow capacity, increasing their ability to transfer resources among themselves, as with the 2014 Hungarian–Slovakian interconnector. These efforts have been driven primarily by the EU Third Energy Package, which seeks to expand internal infrastructure but also requires unbundling of the production, transmission, distribution, and storage of natural gas by a

single company – measures that apply directly to Gazprom's monopolistic hold on both upstream and downstream energy sectors within the EU. While realization of the package was intended for 2014, effective integration is not expected to be attained for several years. However, the continuing crisis in Ukraine has given additional impetus to harmonizing energy strategies and enhancing transparency, as captured in the February 2015 announcement of an EU Energy Union to create a single European energy market, requiring a 'fundamental transformation' away from a 'fragmented system characterized by uncoordinated national policies' (European Commission 2015).

Purposeful progress on implementing the Third Energy Package and forming its Energy Union could assist the EU with the rationalization of its LNG capacity and thus the ability to tap into other suppliers; Western Europe currently has gasification facilities that are underutilized due to lack of transport infrastructure. Spain, for example, is home to 6 of Europe's 22 existing import terminals, representing a major potential in Europe's existing LNG capacity (Gas Infrastructure Europe 2014). Furthermore, Lithuania has recently completed and operationalized an LNG based on Floating Storage and Regasification Unit (FSRU) technology and Poland is scheduled to complete its own LNG terminal in 2015 – both countries are highly dependent on Russian resources.

In light of these challenges, some EU member states have attempted to secure supply through alternate routes for Russian gas, bypassing volatile transit states such as Ukraine and Belarus. This includes the Nord Stream pipeline, which connects Germany directly to Russia via the Baltic Sea, and the recently scrapped South Stream pipeline, which was planned to connect Russia to EU states including Austria, Italy, and Greece, through Bulgaria, but has been subsequently replaced by plans for 'Turkish Stream', where Russian gas would be transported through Turkey to the EU border.³ These efforts may secure supply to specific member states, but they fail to diversify supply from Russia and have drawn extensive criticism from member states such as Poland and Lithuania, who are to be bypassed by the new pipelines and who argue that the pipelines will give Russia increased leverage.

Other proposed alternatives include gas imports from the Caspian region (via the Trans-Adriatic Pipeline [TAP], traversing Turkey, the Southern Balkans and Italy) and increased imports from North and West Africa – both discussed in more detail in Chapter 3 of this volume. The Caspian option, a replacement for the more ambitious Nabucco project, would be able to service only an additional 10 bcm of gas destined for Europe, while the political volatility of the latter option has given rise to considerable concerns.

President Putin's recent annexation of Crimea and continued destabilization of Eastern Ukraine, as well as Gazprom's repeated threats to shut off supplies to – and through – Ukraine in its continuing payment dispute with Kiev, have raised the alarm in capitals throughout the EU. With the Eurozone's economic recovery still struggling to gain traction, any increase in the price of energy (or the elimination of supply) would have resounding effects, and could easily thrust the EU economy back into recession. As the intentions of a resurgent Russia remain unclear, leaders must now face the reality that this dependence could be used as a political weapon, and steps to resist further integration at the national level are being confronted by EU policymakers with vigour. The creation of the Energy Union, combined with rigorous sanctions against Russia for its activities in Ukraine, makes clear the EU's current emphasis on recapturing energy security.

Meanwhile, the EU finds itself caught between extensive climate commitments and economic imperatives. In 2007, it laid out a set of ambitious climate targets for 2020 – the first major step in its effort to reduce GHG emissions by 80–95 per cent below 1990 levels by 2050. Dubbed '20-20-20', the framework stipulated that, by 2020, emissions would be reduced by 20 per cent from 1990 levels, energy derived from renewables would be 20 per cent, and energy efficiency would be increased by 20 per cent. The emissions reduction and renewables targets included mandatory, tailored targets for individual member states, while the efficiency element was non-binding. Moreover, the creation of an EU Emissions Trading System (ETS) set a cap on the amount of GHG emissions to be emitted from power plants, factories, and other energy-intensive enterprises. Under the system, some 'allowances' are auctioned off, and some distributed. However, the ETS has been plagued by an excess of credits, driving the price of carbon to very low levels and thus rendering the system ineffective. There has been a divisive political debate in the European Parliament on how to reform the ETS and when such reforms would be put into effect.

Exogenous events have also had a noticeable impact on the effectiveness of EU climate policies. The fallout from the 2011 Fukushima disaster has continued to reverberate. The accident called into question the future of nuclear energy in Europe, most notably in Germany where the government unilaterally ended its support for nuclear power shortly after the Fukushima incident and plans to phase out all nuclear power by 2022. The move to eliminate nuclear from the domestic energy mix, largely driven by strong popular opposition to the power source, has been echoed in Italy, Switzerland, and eventually Belgium. While certain countries (like Finland, Poland, Hungary, the Baltic states, and the

United Kingdom) have renewed their support for nuclear energy to diversify their energy mix and reduce energy costs, the percentage share of nuclear power in the European energy mix has been significantly reduced without a clear plan for what will take its place. For some countries, like Hungary or Finland, nuclear energy entails Russian technology and commercial dependency and transparency questions as well.

It has become increasingly clear that EU consumers have paid, are willing to pay, and will continue to pay a price to develop and deploy more costly renewable energy technologies. While wholesale electricity costs are rapidly decreasing in the EU and are generally on par with the USA, the taxes and levies for financing the climate policies continue to keep costs at a high level. Currently, electricity costs in the EU are 2.5 times those in the USA and Russia. Perhaps even more disconcerting, EU industry gas prices are between three to four times higher than in the USA, Russia, or India, and 12 per cent higher than those of China (Buchan 2014). Energy-intensive industries are coming under increasing duress with such high energy prices, although several studies have indicated that the amount of displacement will be relatively modest in the near term (Bressand 2012; Folkerts-Landau 2013).

A stringent climate policy as crafted by the EU in 2007 was justified as a triple win: it would not only satisfy the strong desire to be a leader in combating climate change, but also eventually have positive economic and security results. The EU would be a leader in clean energy technology and produce a large portion of its energy domestically. However, the immediate strains of the prolonged economic recession, the pricing impact of renewables, the move away from nuclear, the failure to catalyse widespread comparable policies in other countries, and the recent developments in Ukraine all present considerable challenges to this long-term strategy. These unexpected economic and security impacts are throwing the persistence of stringent and mandatory climate initiatives into question. The newly proposed 2030 plan already appears to be making certain accommodations as regards economic and security interests, as more ambitious future targets are made voluntary rather than mandatory. Given the EU's ongoing economic and security challenges and its long-standing commitment to a leadership position within international climate negotiations, it is safe to say that EU energy policy is undergoing a paradigm shift of its own, though one far different from that underway in the USA.

A comparison of the energy landscapes in the EU and USA thus indicates strong divergence. The USA, faced with a new paradigm of energy abundance, is increasingly preoccupied with an internal debate on the

potential economic and security benefits of the unconventional oil and gas revolution. The country has received a notable economic and security boost from its new-found energy resources, but faces considerable headwinds on the climate change front. The EU, meanwhile, is facing immediate security and economic concerns. The need to ensure the consistent physical availability of energy at an affordable cost threatens its ambitious climate agenda, as that, too, involves near-term economic challenges.

This context gives rise to two key questions: How might the EU benefit from the US unconventional oil and gas revolution? And what might the USA and the EU do in a bilateral context to advance each other's objectives?

An unconventional revolution in the EU?

The immediate question is whether the US shale experience can be replicated in the EU. An overarching qualitative assessment linking the broad range of numerical results from quantitative studies on potential EU production would indicate that the cost of production would probably be higher, the amount produced more limited, more regulated, and drilled on public land (versus private ownership of land in the USA), and the timeframe delayed as compared to the US experience. Several factors account for the expected differences between the two experiences.

First, it will prove more difficult and costly to gain access to the necessary land in the EU, as the shale plays are generally located close to densely populated areas. Second, the EU does not have a large, locally experienced service industry to spur speedy and cost-effective development. Due to high decline rates and other characteristics of shale gas, extensive drilling is required to maintain production. This further requires a significant number of rigs and skilled workers to fully capitalize on the resource, both of which are lacking in the EU. Third, there are still several questions as to the actual characteristics of the subsurface in Europe. Whereas the subsurface in the USA was well-mapped by the time of the unconventional oil and gas revolution, with exploratory wells averaging 130 a month in between 2000 and 2010, exploratory drilling in the EU has been comparatively minimal. Also the environmental regulations that companies face in the EU are likely to have an impact on the cost and scale of development. Despite bans in individual countries (e.g. France, Bulgaria) the EU has refrained from taking any overarching preventative measures, instead choosing to keep the options open and

issue guidelines accompanying the proposed 2030 climate framework. Nonetheless, regulations at the member-state level and potentially the EU level are expected to be more stringent and thus cost-inducing.

This combination of factors would indicate that the cost of unconventional gas production in the EU will be higher, the timeline more extended, and production probably more limited. In fact, in the studies with the highest production scenarios, anticipated production would only compensate for the decline in conventional production in EU. In other words, import levels would remain as they currently are, as opposed to increasing. The EU would still face the same challenge of diversification, succeeding only in fending off the need for further supply. Because the initial effects of production are not anticipated until the 2030–2035 timeframe at the earliest, domestic shale gas production, as with the EU's climate goals, would serve only as a mid- to long-term solution, doing little to alleviate short-term needs.

It is difficult to address potential without taking a closer look at individual countries. Shale gas production is likely to be led by several EU member states that have already made attempts at production, including the UK, Poland, and Romania. They stand in stark contrast to France, Bulgaria, the Netherlands, Luxembourg, and the Czech Republic which have imposed moratoriums on drilling for shale gas, at least for the time being (Globalpost 2013). Production in the EU is likely to remain state-driven and thus uneven.

The UK has already engaged in initial surveying of shale gas potential, estimating that there is upwards of 40 trillion cubic metres of shale gas in the Bowland Basin in the North of England. The UK's Department of Energy and Climate Change has described shale as having the potential to contribute to the UK's energy security and to increase inward investment and growth. In July 2013, former Energy Minister, now Defence Minister, Michael Fallon stated: 'shale gas represents an exciting new potential energy resource for the UK and could play an important part in our energy mix' (BBC 2013).

Similarly, in southern Europe, oil companies in Spain are planning to spend up to USD 1.3 billion to search for unconventional gas reserves with an estimated value of potentially over USD 900 billion. Romania is believed to have shale gas deposits (shared with neighbouring Bulgaria and Hungary) estimated to contain more than 538 billion cubic metres of gas. Such quantities could supply the country's gas needs for 40 years (Globalpost 2013).

Poland, perhaps the furthest along, has moved aggressively to invest in shale development, yet has had to downgrade its initial estimates

significantly, after test drilling failed to identify commercially viable deposits. While Poland had initially projected 5.3 trillion cubic metres of shale gas, it now projects a maximum of 768 billion cubic metres (Globalpost 2013). Exxon Mobil, which had invested more than USD 20 million in drilling two exploratory wells in Poland, did not find viable quantities of shale gas (Bloomberg 2011). Poland had also imposed a significant energy tax regime for international companies exploring its shale gas potential, hastening the departure of several companies. In May 2013, Canadian Talisman and the US Marathon pulled out of projects in Poland as a result of the country's strict regulations (Cienski 2013). Thus, a closer look at individual EU member states would indicate potential for development of unconventional resources but with administrative hurdles – supporting the projections of higher costs and smaller-scale development in the EU.

The greater potential impact of shale gas is more indirect than its actual extraction value. A combination of the LNG demand that has been taken off of the market by new domestic supplies in the USA as well as the anticipated increase in LNG export capacity from the USA (and other sources) will probably increase the 'liquidity' of the gas market, freeing up more LNG supply that could be directed towards Europe. While the amount of increased LNG available for gasification in EU facilities will be marginal, the increased diversity in supply would put pressure on existing and future gas contracts to lower prices, helping to lower energy costs. Moreover, current lower global energy prices combined with a depreciating euro have served as a stimulus to anaemic EU economies, perhaps spurring speedier internal integration of infrastructure and the addition of new LNG import facilities which are prerequisites for taking full advantage of the increased liquidity.

The US–EU energy relationship

The USA and the EU share a robust, values-based, and mutually beneficial political and economic relationship. The EU and the USA have one of the largest bilateral trade relationships globally, reflected in investment flows and in trade in goods and services. These strong mutual economic interests naturally translate into mutual energy security and competitive interests, as the two combined represent over 40 per cent of global energy consumption and account for over 40 per cent of global carbon emissions (BP 2013).

As indicated earlier in this chapter, in the latter half of the 20th century these mutual concerns over energy security were largely centred

on oil flows from the Middle East, sparked by the Arab oil embargo of 1973. The resultant formation of the IEA and the implementation of mechanisms to mitigate supply disruptions helped to stabilize the global oil market, but Western scepticism remained. Accompanying attempts at diversification away from dependence on the Middle East resulted in Europe's growing dependence on Russia, which, even during the Cold War, seemed a more stable option. The issue of climate change and the need to mitigate its effects became increasingly salient as the 20th century drew to a close, resulting in international attempts at emissions reduction agreements, most notably the Kyoto Protocol, signed in 1997. The EU emerged as a climate stalwart during these international efforts, supported (albeit to a lesser extent) by the USA due to the latter's interest in diversifying away from dependence on imports of fossil fuels.

While a mutual interest in energy security and in climate change mitigation has historical precedents and has been consistently acknowledged by both sides, there have only recently been efforts to provide a structured dialogue on the topic. During EU-US Summits in 2006 and 2007, for example, both sides agreed to set up a forum to discuss energy security and climate change, resulting in the establishment of three mechanisms: a strategic review of EU-US energy cooperation conducted annually, a dialogue on climate change, and an EU-US Energy CEO Forum (Belkin 2008). These forums proved largely ineffective, convening only a few times in the ensuing years. This initial attempt at providing a structure for transatlantic energy cooperation was then replaced by the EU-US Energy Council, launched on 4 November 2009. The new Council was predicated on similar goals, focusing on three pillars – the transition to a low-carbon energy economy, energy technology cooperation, and energy security – but it provided a new framework for discussing those elements more coherently.

Beyond the creation of an institutional dialogue, the USA has engaged in more direct support of European energy security as well. Following Moscow's decision to stop the flow of Russian gas through Ukraine to European consumers in 2006, Vice-President Dick Cheney criticized Russia for using energy resources as 'tools of intimidation or blackmail', comments later echoed by President George W. Bush. The 110th Congress held several hearings on the issue of European energy security and the best stratagem for US assistance. Concrete support came largely in the form of efforts to build a Southern Gas Corridor, originally through the construction of the Nabucco pipeline. Despite support from both the USA and the EU for the Nabucco pipeline, intended

to span from the Caspian Sea to Austria, bypassing Russia, the project was deemed commercially non-viable. The alternative is a more moderate project, connecting a Trans-Anatolian Pipeline (TANAP) to be built by 2018 with the TAP. While the combination of TANAP and TAP will succeed in bypassing Russia, its capacity will be only one-third of the intended capacity for the Nabucco project, and would be able to cover only 1 per cent of total EU demand.⁴

In June of 2013, President Obama and Presidents Barroso and Van Rompuy of the European Commission and Council respectively, announced that the USA and the EU would be launching negotiations to establish a TTIP. The Free Trade Agreement (FTA) is intended to increase market access by eliminating barriers between the EU and the USA, promoting competitiveness on both sides of the Atlantic. The TTIP, however, goes beyond normal FTA agreements in its attempts to include a level of regulatory cooperation, thus greatly increasing compatibility between the two markets. Rumours that EU negotiators sought the inclusion of an energy chapter were confirmed when a draft of the chapter was leaked by the *Huffington Post* in May 2014.⁵ The leaked chapter included provisions for LNG exports to Europe – a topic that was expected to be encompassed by the scope of the agreement, but one that has been the subject of dynamic debates in the USA, highlighting a topic of potential dispute. Even though there is little precedent for a separate chapter on energy, EU negotiators have been pushing for the inclusion of such a chapter to become a precedent for future international trade agreements.

These developments were not operating in a political and economic vacuum, however, and several events have challenged the foundation on which the transatlantic energy dialogue has been based. First, the financial crisis of 2008 brought a sudden domestic preoccupation with weak economic conditions in both the USA and the EU, resulting in internally focused struggles to preserve the respective national energy agendas amid severe economic and fiscal constraints that left governments struggling to finance and subsidize renewable energy sources. Additionally, this divergence in cooperation on clean energy was further exacerbated by the advent of the unconventional oil and gas revolution in the USA, which left the EU alone in its paradigm of energy scarcity and import dependence. Finally, the decades-long debate on energy security became particularly acute as tensions with Russia increased over the crisis in Ukraine. Russia's potential use of energy as a weapon despite its dependence on the EU as a consumer became more salient and disconcerting, forcing the latter into a more immediate need to address

energy security than it had been in decades, resulting in the declaration of an Energy Union.

The combination of these three key developments pushed the dialogue concerning the green growth agenda to the background, while highlighting EU economic and energy security woes. The emphasis on energy security was underscored in April 2014 by the joint statement from the 5th EU–US Energy Council meeting, which highlighted the Ukraine crisis, encouraging EU diversification of energy supplies, the expansion of the Southern Gas Corridor and the integration of the European energy market. These sentiments were echoed in the G-7 Summit Declaration and the Communication from the European Commission on the European Energy Security Strategy later that year. These latter communications went one step further, to include the integration of the LNG market and the development of unconventional gas resources within the EU, in addition to calls for assessments of emergency response capabilities and energy security resilience.

While these communications are important for transatlantic unity and solidarity, they are less persuasive in their actual achievements in the context of the transatlantic energy dialogue. They ignore the deeper, divisive issues facing transatlantic energy cooperation, highlighting longer-term propositions that will not necessarily succeed in mitigating near-term EU energy dependence. With a more integrated LNG market, for example, new infrastructure would be required both in the USA and the EU, necessitating significant investments and an extensive construction period. The LNG FSRU in Lithuania was completed in December 2014 and Poland's LNG facility is expected to be operative in 2015, but they are insufficient to break Eastern Europe's dependence on Russian gas. Further, with higher gas prices in Asia than in Europe, the Asian market is economically more appealing to US LNG export projects. This economic LNG outlook, compounded by the bureaucratic hurdles still to be overcome in the US approval process, would indicate that an integrated LNG market can be a mid-term solution at best.

TTIP, meanwhile, is increasingly looked to as a way to expedite delays in the LNG export debate, as the establishment of TTIP would endow the EU with FTA status, removing the US legal limits on gas exports. The political tide in Washington has turned on this issue in the context of TTIP, with the USA much more willing to concede on LNG exports in the face of the EU's energy security woes. In House Resolution 499 (issued in March 2014), for example, legislators recommended that 'the United States . . . promote increased natural gas exports and energy efficiency' as a means of reducing Russian influence in Eastern Europe

(113th Congress, 2nd Session 2014). On his visit to Poland in June 2014, President Obama acknowledged the urgent need to address Europe's energy vulnerability and reiterated the importance of TTIP in helping to facilitate US exports. While careful to avoid suggesting that energy should be included as an individual chapter in the negotiations, he noted that the passage of the agreement would make it 'much easier [for him] to approve natural gas exports' to Europe.

Nonetheless, TTIP is a general trade agreement which encompasses a diverse set of issues ranging from digital trade to agriculture. Negotiations are complex and will take a long time to complete under the best of political circumstances (which currently do not exist), precluding a speedy agreement or immediate Congressional ratification. Further, there is US opposition to going beyond the provisions for LNG exports to Europe and creating an energy chapter more generally. While the EU negotiators are seeking to establish a model through the energy chapter for third parties to emulate in other such agreements, there is scepticism in the USA of making such broad, binding resource commitments or a means to limit US competitiveness.

The issues facing the incorporation of an energy chapter in the TTIP negotiations are perhaps reflective of the greater issues facing the transatlantic energy dialogue today. Traditionally, the dialogue has focused on overarching top-down foreign policy efforts, as instigated by such bodies as the EU–US Energy Council or as exhibited in recent communications encouraging such actions as the integration of the internal European energy market and the expansion of the LNG market. However, such overarching efforts are not compatible with current commercial realities, or are difficult to build consensus on and ultimately difficult to implement. With the growing divergence in EU–US positions, even pre-existing agreements are becoming tenuous. The EU countries are structuring their innovation adoption and implementation in ways quite different from the USA.

As with any divergent positions, strong partners and allies seek to find common ground. As Robert Keohane and David Victor (2013, p. 99) argue on a conceptual level, international cooperation on such issues requires compatible commitments that are intertwined with national interests and which yield 'tangible joint gains'. The need for economic growth and stability is a concern on both sides of the Atlantic: and technology innovation – traditionally a joint goal, as espoused in the establishment of the EU–US Energy Council – is a key step to achieving/retaining economic competitiveness. Rather than imposing a top-down innovation regime, it would be wise to establish a more competitive

marketplace across the USA and the EU, create a stable regulatory regime, and increase competition to spark innovation. This is the underlying logic behind finalizing TTIP and the basis for an effective transatlantic dialogue. But these must be translated into the energy sphere as well.

In conclusion, we have seen that exogenous and internal events have led the EU and the USA to come to very different positions within an evolving and increasingly globalized energy landscape. The USA faces a future characterized by greater abundance of fossil fuel, while the EU is eyeing a tenuous economic and energy security situation. The EU is battling to uphold determination to address climate change even in the face of rising energy costs and anaemic economic growth, while the USA seeks to bridge a deep domestic political divide on the merits of climate change action in the face of an economic recovery and falling energy prices. The transatlantic dialogue on energy issues has been re-invigorated by the security crisis in Europe and the ongoing TTIP negotiations, but the actionable areas for mutual support and assistance remain difficult to achieve. Transatlantic leaders would benefit from building on this urgency with sustained political leadership dedicated to a broad range of energy issues, honestly and realistically addressing the policy divergences, domestic challenges, and new energy paradigms – and ultimately developing a new policy framework that can achieve tangible results.

Notes

- 1 When discussing liquids output, it is important to consider the key role of natural gas liquids (NGLs) in the US unconventional oil and gas revolution. Produced either in conjunction with natural gas or as a by-product of the crude oil refinery process, NGLs act as inputs for a range of industrial processes, including petrochemical manufacturing and refining. NGL production in the USA has surged to over 20 per cent of global production in recent years. See *Natural Gas Briefing Document #1: Natural Gas Liquids* available at <http://www.brookings.edu/~media/Research/Files/Reports/2013/04/01-natural-gas-ebinger-avasara/Natural-Gas-Briefing-1-pdf.pdf?la=en>
- 2 The question of mutual energy independence between Russia and the EU, and the possible effects of the recent crisis in Ukraine on their energy cooperation, are dealt with in detail in Chapter 4 of this volume and are therefore not discussed at length here.
- 3 The factors influencing Russia's decision to scrap the pipeline are still under speculation. Russia has proposed a new pipeline project (Turkish Stream) under the Black Sea and through Turkey to the border with Greece.
- 4 Russia's December 2014 announcement of a potential pipeline through Turkey – Turkish Stream – could call into question the building of TANAP and TAP in question as it presents direct economic competition. For more on

Turkish Stream, see <http://www.wsj.com/articles/russia-turkey-complete-initial-turk-stream-gas-pipeline-talks-1418288422>

- 5 See http://www.huffingtonpost.com/2014/05/19/trade-fracking_n_5340420.html for details.

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8

Brazil – A New Global Energy Player and Partner for the EU?

John Todd and Benjamin de Carvalho

Introduction

According to recent International Energy Agency (IEA) estimates, Brazil is on the verge of becoming a new global energy player. In 2015, it is likely to become a net oil exporter and one of the top ten producers of oil globally. Further, Brazil is predicted to be the world's sixth-largest oil producer by 2035, and its biofuels exports could account for some 40 per cent of the trade in global biofuels. However, in order to play this role, the country will have to overcome several technological and governance-related hurdles that have delayed the development of its giant offshore discoveries.

The EU is currently Brazil's main trading partner and may become one of the areas to which more Brazilian energy commodities will be exported in the future. There are some clear overlaps and complementarities between the energy policies of the EU and Brazil. Both actors share an interest in building a more sustainable energy system, so both have a strong focus on development of renewable sources of energy. With a high share of renewables in its energy mix, with its vast rainforests playing an important role in limiting the negative impacts of the use of fossil fuels, and with the prospect of becoming a key global player in conventional fuels, Brazil is an attractive energy partner to the EU. Brazil may be interested in exporting some of its energy commodities, including biofuels, to the EU. For its part, the EU is indeed interested in diversifying its energy supplies and making its energy mix more sustainable. Having access to reasonably priced and sustainable energy coming from a partner that shares values and norms with the EU¹ may help the EU to improve not only its energy security but also its competitiveness, which is the third strategic goal of the EU's energy policy. In addition,