

The Geopolitics of Natural Gas

The Politics of Natural Gas Development in the European Union

Harvard University's Belfer Center and
Rice University's Baker Institute Center for Energy Studies

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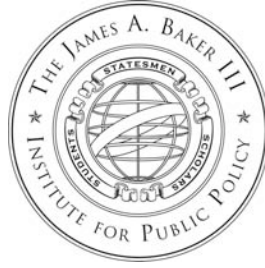
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THE POLITICS OF NATURAL GAS
DEVELOPMENT IN THE EUROPEAN UNION

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ABOUT THE STUDY

Some of the most dramatic energy developments of recent years have been in the realm of natural gas. Huge quantities of unconventional U.S. shale gas are now commercially viable, changing the strategic picture for the United States by making it self-sufficient in natural gas for the foreseeable future. This development alone has reverberated throughout the globe, causing shifts in patterns of trade and leading other countries in Europe and Asia to explore their own shale gas potential. Such developments are putting pressure on longstanding arrangements, such as oil-linked gas contracts and the separate nature of North American, European, and Asian gas markets, and may lead to strategic shifts, such as the weakening of Russia's dominance in the European gas market.

Against this backdrop, the Center for Energy Studies of Rice University's Baker Institute and the Belfer Center for Science and International Affairs of Harvard University's Kennedy School launched a two-year study on the geopolitical implications of natural gas. The project brought together experts from academia and industry to explore the potential for new quantities of conventional and unconventional natural gas reaching global markets in the years ahead. The effort drew on more than 15 country experts of producer and consumer countries who assessed the prospects for gas consumption and production in the country in question, based on anticipated political, economic, and policy trends. Building on these case studies, the project formulates different scenarios and uses the Rice World Gas Trade Model to assess the cumulative impact of country-specific changes on the global gas market and geopolitics more broadly.

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Introduction

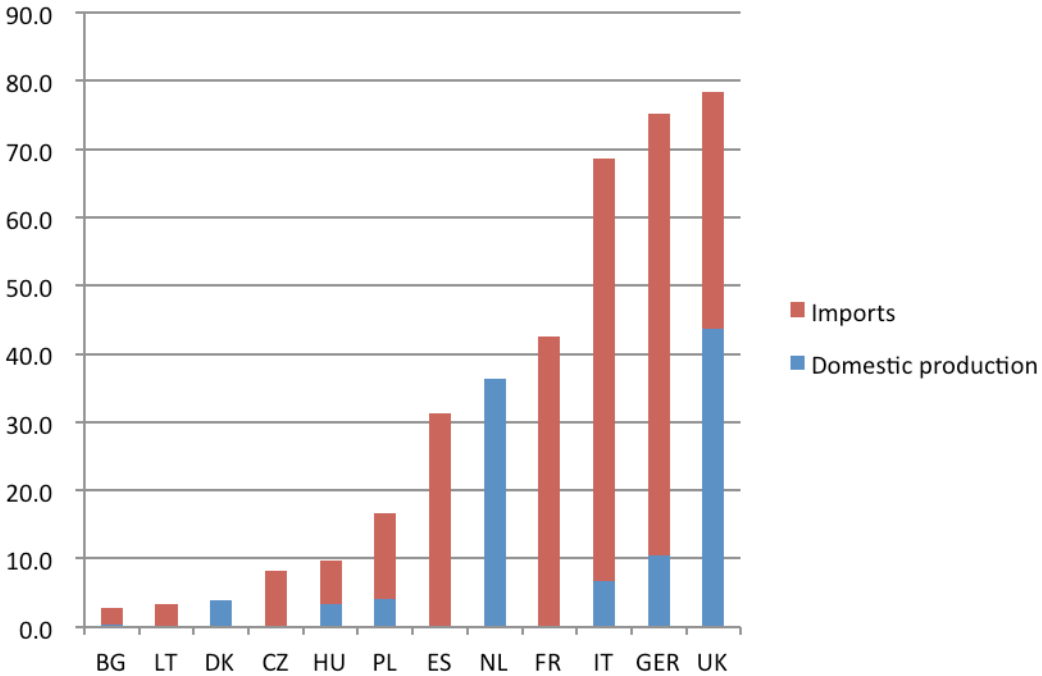
Europe is one of the largest natural gas markets in the world, and it is the world's largest import market.¹ In 2011, the EU-27 gas market stood at 448 billion cubic meters (bcm), second only to the US market of 690 bcm (BP 2012). Europe's domestic natural gas production has consistently decreased over the past years, and stood at some 168 bcm in 2011 (Eurogas 2012). As a corollary, Europe's share of imports in European gas consumption has grown from 48.9 percent in 2000 to 62.4 percent in 2010 (Eurostat 2012). Most of the gas imported to the EU is supplied by pipeline, but a growing share—15 percent in 2011—is supplied by Liquefied Natural Gas (LNG). The EU's largest external sources of natural gas are Russia at 24 percent of total imports, Norway at 19 percent, Algeria at 9 percent, and Qatar at 8 percent (Eurogas 2012). Among these, Norway is a member of the European Economic Area (EEA) and therefore part of relevant EU regulatory frameworks. The only external supplier enjoying a significant or even dominant position in both Western and Eastern European countries is Russia. Russia gained importance in Western European (i.e., by then EU-9) gas supplies since West Germany inked its first long-term gas contracts with the USSR in the early 1970s. In the formerly communist EU member states, Russia retained its role as a dominant gas supplier after the fall of the Iron Curtain. Here, dependency rates are up to 100 percent of some countries' imports (see Figure 1). Europe's high dependence on foreign sources of natural gas, notably from Russia, has caused security concerns among observers and the EU's allies.² Several observers, however, also point to the interdependent nature of EU-Russian gas relations (Finon and Locatelli 2008; Goldthau 2008).

¹ Europe refers to the EU-27, not to the continent as a whole. EU-27 represents 95 percent of the European gas market, excluding Ukraine and Belarus. BP, *Statistical Yearbook of World Energy*. (London: BP, 2012). It therefore serves as a reasonable proxy for Europe as a whole. The terms EU-27, European Union, and EU are used synonymously throughout this study.

² Russia also enjoys a dominant position in the EU's supply of crude oil and hard coal, which, however, is not a subject of this study.

Figure 1. Import Dependence on Natural Gas for Select EU Countries, 2012

Market size, bcm



Sources: BP 2013; Eurostat 2012

Unlike the US gas market, which is liberalized and operates on spot and futures trading, the European market is dominated by Long-Term Contracts (LTCs), take-off agreements that typically span 20 or more years and tie a gas producer and a gas consumer into a bilateral trade relationship. LTCs traditionally also peg the gas price to a basket of substitute fuels, notably oil. While spot markets are gaining importance, the prevailing gas pricing model in Europe essentially reflects oil price movements rather than actual demand and supply patterns. The UK, a natural gas producer, remains the outlier country where the gas market is fully liberalized and operates on a spot (and futures) market basis. Not surprisingly, the European gas market has so far remained incomplete. While the European Commission has pushed gas market liberalization throughout the past two decades, Europe's gas markets remain fragmented (i.e., defined by national borders and policies), comparably illiquid (a function of LTCs and the now abandoned destination clauses that for long ensured exclusive delivery to national European markets), and

dominated by incumbent utility companies, many of which are state owned and come with long-standing bilateral ties to external suppliers.

Against this backdrop, this study, “The Politics of Natural Gas Development in the European Union,” is important because it highlights the role of supranational regulation and policies for the future development of the world’s largest import market in natural gas. It also points to the strong repercussions that trends on international gas markets have for large import markets. This study finds that the US “shale gas revolution” has prepared the grounds for a fundamental change in the European gas market and for incumbent pricing models. In this context, as this study shows, the European Commission has an important role to play. The EU’s policy agenda toward more competition, liberalization, and gas market integration, along with its push for decarbonizing the European energy system, neatly dovetail with a favorable international supply environment in natural gas. As pointed out by the scenarios later in this study, the European gas market could therefore see the emergence of a new gas pricing model, away from the incumbent oil price peg. In this case, Europe will become the world’s largest and most attractive gas import market, with suppliers from all world regions competing for market shares—Russia being only one of them. At the same time, this study also shows that the power of Brussels is limited, for reasons of regulatory competences as well as financial capacity. Therefore, much will rest on the EU member states and their policies to allow for more domestic gas-on-gas competition, and also with regards to their regulatory frameworks for the exploration and production of indigenous European shale gas reserves.

Background

Natural gas plays an important role in Europe’s energy mix and made up 23 percent of primary energy consumption in 2011. Natural gas is primarily used in power generation (31.7 percent), households/heating (27.2 percent), industry (19.4 percent), and the service sector (10.8 percent) (European Commission 2012b). Natural gas consumption fell by 10 percent in 2011, which is partially in line with a general decrease in primary energy consumption in Europe, and partially a result of cheap imported coal replacing gas in power generation (Eurogas 2012). Still, estimates by the International Energy Agency (IEA) suggest that the European gas market might grow to

some 618 bcm by 2035 (IEA 2012c, 128). This is mainly a function of the EU's decision to embark on an ambitious path towards de-carbonizing its energy system. The "20-20-20 targets" of the EU's 2007 climate and energy package set three key objectives: reducing EU greenhouse gas (GHG) emissions from 1990 levels by 20 percent, raising the share of EU energy consumption produced from renewable energy sources (RES) to 20 percent, and improving the EU's energy efficiency by 20 percent by 2020. Except for the energy efficiency component, EU member states seem to be on track to meet these targets. Looking beyond 2020, the European Commission's 2011 Energy Roadmap envisaged the EU to cut its emissions by 40 percent by 2030, 60 percent by 2040, and 80 percent by 2050 compared to 1990 levels (European Commission 2011). In this scenario, the power sector is emission-free, and only industry, transport, and agriculture will still be allowed to emit greenhouse gases. While it is debatable whether these goals will be fully met, they point to an important trend in EU energy policy: replacing carbon heavy fuels such as coal with renewables, and backing this transition up with natural gas as a "bridge fuel" in order to achieve a more sustainable future for the European energy system. Not surprisingly, the EU Commission assigns an important role to natural gas in its 2050 roadmap.

In particular, Central and Eastern European (CEE) countries still heavily rely on coal in their power generation. In Poland, for instance, 86.6 percent of electricity production is based on solid fuels, mainly hard coal, whereas natural gas only provides 4.2 percent. In the Czech Republic natural gas makes up 4.8 percent, and in Bulgaria, 4.2 percent (European Commission 2012b). Bulgaria and the Czech Republic rely heavily on nuclear rather than coal. While these are comparatively small natural gas markets at present, their growth potential is high. EU policies will force these countries to reduce the share of carbon-intensive coal in electricity generation and to replace aging nuclear power plants. In both cases, natural gas will be the fuel of choice, at least in the short to medium term. Germany probably represents the most extreme example of a country that is set to fundamentally transform its power sector within the next decades. Germany's *Energiewende* aims to replace nuclear and coal with renewables and reduce GHG emissions by 95 percent until 2050 (Bundesministerium für Umwelt 2011). Again, natural gas will serve as a bridge fuel and provide for the indispensable back-up capacity in an electricity market favoring "green" over fossil-based electrons.

It is important to note that current and projected trends in European natural gas demand and the role of natural gas in its energy mix are to a large extent driven by policy choices and regulation, and to a lesser extent by the price—at least in comparison with the United States. Unlike in the US, where gas prices hit record lows of 3 USD or less per MMBTU after 2008 and fostered a fuel switch from coal to gas, European natural gas is comparatively high priced. A snapshot shows that the price of gas imports at the German border—traditionally an indicator of oil-indexed and LTC based gas imported into Europe—trailed at 12 USD per MMBTU in 2012 (Bundesamt für Wirtschaft und Ausfuhrkontrolle 2013). This compares to a spot market price of some 9.5 USD per MMBTU on the National Balance Point (NBP) in the UK since 2011 (BP 2013). Therefore, demand-side policies, regulatory incentives, and subsidies will play a major role in determining the role of natural gas in Europe’s future energy mix—alongside other energy sources such as renewables.

In terms of supply trends in natural gas, domestic production in key EU producer countries is rapidly declining. Two EU member states remain net exporters—the Netherlands and Denmark. The Netherlands produced 64 bcm in 2011, and Denmark, 7.1 bcm. The UK, the EU’s second largest gas producer, turned net importer of natural gas in 2004 and now produces 45 bcm of gas per year (BP 2012), short of 35 bcm to cover its domestic consumption. The IEA expects EU natural gas production to reach 165 bcm in 2035 (IEA 2012a). As a corollary, the EU’s import needs will rise to 74 percent of total consumption by that year. Note that this import share already accounts for potential unconventional gas production in the European Union, which the IEA estimates at 47 percent of domestic production, or 77.5 bcm, in 2035. In other words, shale gas—if developed in the EU—will essentially stabilize domestic European gas production, and not reduce import dependency. At present, however, the shale gas industry in Europe remains at best in its infancy. There is no shale gas production as of yet (see also Pearson et al. 2012 for more detailed discussions).

Several ongoing or envisaged projects are geared toward enhancing Europe’s pipeline network, both vis-à-vis crucial external supplier regions and within the EU. Compared to other large markets such as the US, the European gas pipeline infrastructure features some rather specific characteristics. Historically, European gas infrastructure was developed around gas fields located

in southern France, northern Italy, Germany, and Romania, and later the Netherlands and the UK. Once imports from external suppliers such as Norway, Russia, and Algeria became more prominent as sources of natural gas, import corridors were established connecting these external supplier regions with their respective European national markets. As a consequence the European gas pipeline infrastructure typically spans across several countries, tends to be geared toward facilitating imports, and reflects regional patterns of producer-consumer relationships rather than constituting a fully integrated and unified system. In light of this, a major challenge consists in integrating scattered European gas market infrastructure, connecting national markets, and strengthening infrastructure projects towards supplier regions.

Box 1. Levels and Functioning of EU Energy Policy

The 2009 Treaty of Lisbon stipulates that the European Union must ensure the functioning of the common energy market, maintain the security of energy supply in the Union, promote energy efficiency and renewable energy, and promote the interconnection of energy networks (European Commission 2008, Art. 194). European energy policy and legislation is shared between the supranational (EU) and national (member state) levels. Among the supranational bodies of the EU system, the European Commission owns the competence to table policy proposals, foster the integration of (energy) markets, and enforce common EU legislation. The Commission has used this competence to push for EU-level regulations in natural gas. Three set of directives (“Energy Packages”) in 1998, 2003, and 2009 gradually created a common framework for liberalizing the EU gas market, based on general EU single market rules and informed by competition law. The EU Parliament is also involved in EU-level energy legislation through the co-decision procedure. The EU’s external energy interests are formally represented by the High Representative in Foreign Affairs and Security Policy, the EU’s Energy Commissioner, and the presidency of the Council of the European Union, although in practice the energy commissioner resumes that role. Still, EU member states remain key players in EU energy policy. They take policy choices regarding their national energy mix and energy supply structure, decide on their participation in transnational energy infrastructure projects, and support or block policy initiatives taken by the EU, where they are represented in the European Council, the intergovernmental body of the EU system. Member states also retain direct ties to external producers and often remain directly involved in the domestic energy sector through state ownership.

EU energy policy is subject to several levels of competence, with the EU Commission and national governments both playing an important role (see Box 1). As a consequence, supranational EU bodies and EU member states exert important influence in stimulating investments into critical infrastructure, addressing the public goods nature of interconnectors, and incentivizing state-owned or private companies to maintain and enhance national and transnational grids. In order to strengthen the resilience of the European gas infrastructure against supply shocks and further integrate the system, the European Commission has taken several measures. Most importantly, in 2011 it tabled a comprehensive package of policy measures aimed at enhancing trans-European energy infrastructure. These measures specifically

prioritize cross-border interconnectors and gas storage in addition to LNG projects. Among 12 priority infrastructure projects, four “priority gas corridors” are especially earmarked for support: These “North-South gas interconnections in Western Europe” essentially support the establishment or enhancement of interconnections between the UK and Ireland, France and Belgium, France and Luxembourg, Germany and Austria, as well as Italy and Malta. The “North-South gas interconnections in Central Eastern and South Eastern Europe” aim at linking up gas infrastructure between Slovakia and Hungary; Slovenia, Italy, and Austria; and the Czech Republic and Poland, and enhance reverse flow capacities in southeastern Europe, notably between Bulgaria, Romania, and Greece. Moreover, the “Baltic Energy Market Interconnection Plan in Gas” is supposed to link up the Baltic countries—currently representing “energy islands” fully dependent on Russian gas and isolated from other European gas markets—with the rest of the EU, notably Poland and Finland, in addition to connecting Norway and Denmark. Finally, the “Southern Gas Corridor” establishes a direct connection between gas-producing countries in the Caspian region (e.g., Azerbaijan and Turkmenistan), the Middle East (e.g., Iraq) and EU Member States, via Turkey (European Commission 2013d). As the fate of the much-discussed (and now abandoned) Nabucco pipeline reveals, the Southern Corridor is not likely to become a major channel for gas imports and might remain only a minor addition to more diversified import routes.

The EU Commission estimates that energy infrastructure projects amount to 89 billion EUR in investment costs until the end of this decade. Therefore, the EU has earmarked 9.2 billion EUR for priority infrastructure projects between 2014-2020, the bulk of which will be absorbed by gas and oil projects (European Commission 2012a). The EU hopes that strengthened intra-European networks will not only enlarge the overall pipeline system of currently around 135,000 km (EGIG 2011), but also further deepen the market, facilitate cross-border flows of natural gas, foster gas-on-gas competition, and eventually lead to the establishment of regional trading hubs of significant size and liquidity, like in the US market.

Besides EU-driven infrastructure projects, several EU member countries are involved in large-scale gas pipeline projects driven by Russia. These pipelines notably involve Nord Stream, a 55-bcm pipe linking Russia and Germany across the Baltic Sea since 2012; and South Stream, a 16

billion USD offshore pipeline planned to carry 63 bcm from Russia to Bulgaria through the Black Sea, and further to Serbia, Hungary, Slovenia, and possibly Italy. South Stream has been initiated to circumvent the Ukraine, a key transit country that has been involved in several gas disputes with Russia during the last decade, impacting European supply.

Box 2. Energy Transit and the Russia-Ukraine Gas Disputes

Disagreements over gas prices between Russia and Ukraine led to several incidents over the supply to the European downstream market. During the “gas dispute” of January 2009, the flow of natural gas to South-East Europe through Ukraine came to a complete halt and caused severe economic repercussions. On the European side, economic damage was estimated at EUR 1.65 billion (European Commission 2010, 36). On the Russian side, Gazprom allegedly suffered from losses amounting to USD 1.5 billion (Stern, Pirani, and Yafimava 2009, 61). The gas standoff put into question Russia’s long-standing reputation as a reliable business partner in Europe’s gas supplies. It also highlighted Europe’s vulnerability stemming from the transit dimension of natural gas. Countries such as the Ukraine, which provides passage for 80 percent of Russian gas exports to EU, essentially enjoy a geographical monopoly over gas flows to the European bloc. In light of this, several large-scale pipeline projects have been initiated to circumvent transit countries, including Nord Stream (through international waters in the Baltic Sea) and South Stream (through the Black Sea). Besides challenges related to transit, the gas disputes notably point to the interdependent nature of EU-Russian gas relations and Russia’s dependence on Europe as its main export market.

As a result of both transit issues and growing import needs, LNG capacity is being developed across European countries as well. Between 2006 and 2011, EU LNG re-gasification capacity has doubled. In 2011, the existing 19 LNG import terminals added up to a total nominal regasification capacity of 187 bcm (IEA 2012b). Industry association Gas Infrastructure Europe (GIE) expects regasification capacity to rise to 259 bcm by 2015 and lists 32 planned LNG terminals, in addition to 6 terminals under construction (GIE 2011).

In addition to strengthening intra-European gas infrastructure, in the past the EU has taken several regulatory measures to liberalize the gas market. The 1998 directive featured limited and

gradual market opening, followed by a second round of liberalization in 2003, requiring that EU member states establish independent regulators and grant non-discriminatory third-party access through legal unbundling of transport from trading. In 2009, the Third Energy Package focused on ownership unbundling, strengthened national regulators, and established a new EU regulatory agency, the Agency for the Cooperation of Energy Regulators (ACER). The Commission also increasingly uses its competence in competition policy to foster its liberalization agenda. Having carried out investigations against several large European gas companies already since the late 1990s, the Commission probed Gazprom's subsidiaries and European business partners in 2011 and again in 2012 for reasons of unfair pricing practices related to oil price indexation and anti-competitive behavior.

Finally, the EU has sought to establish various frameworks aimed at stabilizing energy relations with producer and transit countries. These include the European Economic Area (EEA), firmly tying Norway into the Single European Market (SEM). The country's energy sector now effectively has to comply with SEM rules, designed by Brussels. The EU is also a signatory party to the Energy Charter Treaty, a multilateral framework for cross-border energy cooperation in Eurasia. Moreover, the EU has established the Energy Community, which extends the EU's internal market rules for energy to non-EU South East European (SEE) countries, the Ukraine and Turkey. The EU has also established various Energy Dialogues (though without binding legal character) with Russia, OPEC, and China.

Political Trends

Though often forgotten, the origins of the EU at its core lie in energy. Together with the European Economic Community, the 1951 European Coal and Steel Community (ECSC) and the 1957 European Atomic Energy Community (Euratom) formed the founding elements of what later became the European Union. The main idea behind these communities was to "make war not only unthinkable but materially impossible," as French foreign minister Robert Schuman famously put it. It is fair to say that the EU has achieved this goal. Compared to 65 years ago, the EU is a haven of stability for the countries forming it. It has prospered economically for decades, and the EU model has proven highly attractive not only in economic terms but also as a political

model. It continues attracting more member states, most recently Bulgaria and Romania in 2007, and welcomed Croatia in July 2013 as its 28th member state. As a political system, it is still evolving and has recently recalibrated political authority between the EU level and the national level in the form of the Lisbon Treaty of 2009. As an organization the EU proves to be successful in maintaining peace in a world region that was the battleground of two world wars in the 20th century and has a track record of being highly conflict prone throughout the centuries before. The main element providing for stability consists in EU member states giving up sovereignty to a supranational authority, the EU system. In addition, upon entrance, EU member states are obliged to put institutions in place that ensure democratic governance and a functioning market economy. While these principles certainly strengthened democratic traditions and a smooth transfer of power in Western European countries during the past decades, one can hardly overestimate their contribution to making formerly communist East European countries stay on a firm path towards democratic and peaceful governance during their first years of post-communist transition. It is fair to say that despite backslides (such as the currently strong populist tendencies in CEE and SEE member countries), the EU has ensured political stability among its member states and throughout the continent.

Still, changes in political leadership, particularly on a member state level, can entail important consequences for energy policy. For instance, the shift from a center-right government to a coalition of Social Democrats and Green Party members in Germany in 1998 resulted in the first phase-out of nuclear power, an “ecological tax reform,” and massive deployment of renewables in the country. This also impacted the EU’s energy agenda, not only through policy diffusion but also because of the size of the German market—Europe’s largest in electricity. The Merkel-led center-right government of 2005 in turn prolonged the life span of nuclear power plants again and sought to slow down the country’s low carbon transition.³

With regards to energy policy goals, cleavages along party lines are generally consistent across EU member countries. In general, conservative parties in Europe tend to support business, are in favor of shale gas exploration, and argue for lighter regulation in the energy sector. Green and

³ Obviously, in the wake of the Fukushima disaster in 2011, the same coalition implemented yet another U-turn and proclaimed the total phase-out of nuclear power by 2022.

social democratic parties are more inclined to enact regulation on environmental safety grounds or to foster social welfare goals. That said, there exists a widespread consensus among the leadership of all political parties, particularly in older EU member states, that security of supply concerns should be balanced with environmental goals. This reflects the broader public opinion on energy policy objectives. It is telling that several European governments led by conservative parties foster a clear environmental agenda. This includes Germany, which has embarked on a profound low-carbon transition of its energy stems, remains skeptical toward large-scale deployment of fracking technology, and aims for a functioning European carbon market. It also includes Sweden, which has set ambitious targets for energy efficiency and climate policy as well as a vehicle stock independent of fossil fuels. Similarly, in Austria, characterized by recurrent coalitions in which Social Democrats and the People's Party rotate in leadership, conservatives have consistently supported environmental policies and the country's 1978 ban of nuclear. By contrast, in some CEE member countries such as Poland or Lithuania, the long history of Soviet occupation tends to render supply security a top policy goal across party lines. On the question of shale gas development, Polish and Lithuanian political parties are therefore in broad agreement. In post-socialist CEE countries, affordability also plays a more important role than in most Western European countries, because the energy bill makes up a larger share of monthly household income.⁴ In these countries, the liberalization of energy prices has contributed to economic hardship for households.

An important political factor lies in the current economic crisis in Europe. In the aftermath of the 2008 financial meltdown, many EU countries experienced a strong economic downturn, and some have slipped into deep and long-term recessions. This has not only led to several changes in government bringing in the former opposition (Greece, Spain, Portugal, and Ireland), but also affected public programs aimed at supporting renewable or energy infrastructure. RES programs have fallen prey to austerity packages, and public spending has dried up. On top of this, the crisis has led to broader discussions about the EU as a political model, and the effectiveness and political legitimacy of its institutions. Voices have emerged questioning the effectiveness of EU crisis management, notably with regards to the southern European debt crisis. Several member

⁴ In some Western European countries such as the UK, "fuel poverty" has emerged as a topic of energy policy, but this is not a widespread phenomenon.

states have become highly critical of Germany's increasingly dominant role within what is regarded as a union of equal states. In the UK, serious discussions have resurfaced about leaving the EU altogether. Moreover, the "Eurocrisis" has turned public attention toward the survival of the single currency and the economic consequences of a potential breakup of the Eurozone. As economic and financial issues have come to dominate the agenda, energy has received less attention in the political arena. Instead, the pressing problems of youth unemployment in Southern Europe, persistent negative economic growth rates in many EU member states, and the social effects of austerity policies dominate public discourse. While one should not expect a breakup of the EU as a political union, it is likely that energy security, energy policy, and the role of natural gas in Europe's future energy mix will remain secondary concerns on the political agenda for some time to come.

With regard to stakeholders, various interest groups attempt to exert influence on energy policy in Europe. These include gas utility companies and their European level association Eurogas, advocacy groups, energy regulators and TSOs, and their European level associations CEER and ENTSO-E. Environmental movements tend to be particularly well organized, at least on national levels, and have decades of experience in organizing protests and lobbying. While many of these groups have their roots in the anti-nuclear movements of the 1970s, their activities now span across a large range of energy-related issues, including soil degradation, ground water safety, and the protection of local habitats. In addition, given the comparatively high population density in Europe, groups tend to organize around issues with direct local impact such as energy infrastructure projects (e.g., pipelines, wind turbines, and power transmission lines). In countries that have so far not fully privatized their energy companies, such as France, Poland, and Bulgaria, national oil and gas companies such as GdFSuez, PGNiG or Bulgargas traditionally enjoy closer ties to the government, and are often seen as an integral element of maintaining sovereignty and achieving national energy security goals.

How Political and Historical Trends Shape Current and Future Natural Gas Development

Several important elements and trends can be extracted from the above discussion and are likely to shape future natural gas development in Europe: the EU's liberalization and "market-making"

agenda (mainly relating to regulation), the EU's decarbonization agenda (mainly relating to climate change policies), supply security and environmental concerns driving energy policy on national and European levels (mainly reflecting different policy goals), and the economic crisis.

State Control

The trend within the EU clearly is one towards a more liberalized internal gas market. While the original Single European Market initiative excluded electricity and gas, the European Commission has now deliberately picked natural gas as the next “battleground” for fostering its liberalization agenda. For this purpose, the Commission uses its clear mandate to deepen the integration of the single market. In doing so, the Commission deliberately relies on the “regulatory state” toolbox (i.e., regulation and competition policy). These policy tools also define the likely targets of the Commission's future actions: price distortions and uncompetitive behavior of energy corporations active on the European market. Recent dawn raids in offices of Gazprom's subsidiaries in several European countries, as well as the latest investigations into producer collusion and possible oil price rigging (involving BP, Royal Dutch Shell, and Statoil) indicate that European energy market transactions and functioning have eventually become subject to close scrutiny by EU regulatory authorities. Although several EU member countries will retain state control over their energy companies, the latter will be forced to fully embrace the provisions of the Third Energy Package and play according to EU competition rules. The EU Commission has demonstrated that it is firmly committed to enforcing relevant regulation on national level. In 2012 and 2013 it called on France to revise its system of price regulation, imposed several pending infringement proceedings against member states (Ireland, Slovenia, and others) for not fully transposing the gas directive, and even sent some cases to court (Bulgaria, Romania, Poland, and the UK, among others) (European Commission 2013b). Overall, the number of proceedings based on violating competition law and transposing EU energy regulation is increasing. To be sure, despite ongoing efforts toward integrating the European gas market, there still is considerable room for implementing directives and regulations according to national legislative frameworks, which will for long imply a high degree of heterogeneity in gas market governance in the EU.

Gas Governance

In gas market governance, tensions between the European authorities and national interests will likely persist. As explained in Box 1, energy is a policy area where competences are shared between the EU's supranational institutions and EU member states. The 2009 Treaty of Lisbon gives EU authorities a mandate in the field of energy policy, notably with regards to the functioning of the Single Market (i.e., member states are bound by EU directives on energy market operations and subject to supranational regulatory authority in competition policy). At the same time, however, member states retain their veto right (the option to adopt national policies) with regards to energy taxation, exploiting their energy resources, and choosing their energy mix and gas supply structure. The 27 EU member states feature highly heterogeneous import structures and gas sector organization, ranging from Bulgaria, whose gas industry is state controlled and deeply intertwined with Russian Gazprom, to the UK, a fully liberalized market populated by global gas players. In the past, EU initiatives have frequently been compromised or sidelined by individual member states, their national policy choices, and their bilateral deals. In the case of the Nord Stream pipeline, essentially a German-Russian project, the EU Commission was left with no choice other than giving its blessing by exempting the pipeline from some SEM rules. Similarly, the Russian South Stream project supported by Bulgaria, Hungary, and Italy is commonly regarded a competitor project to the pipelines planned in the EU's Southern Gas Corridor. Frequent claims that Europe should "speak with one voice" in energy affairs—notably vis-à-vis Russia—therefore seem to be missing the realities of European gas sector organization. Since the Lisbon Treaty did not clearly divide control between the EU and national levels, various sources of potential conflict remain.

Regional Politics

As a major importer, Europe's gas supply will remain subject to the political dynamics of important producer and transit countries outside the EU's jurisdiction. Policies geared towards decarbonizing the European energy system resulting in higher gas import needs as well as dwindling domestic resources are likely to render this pattern even more pronounced in the future. The continuing struggle over access to Caspian energy sources, including Russia, Western countries, and China, is a determining factor for future European gas supply. Transit issues surrounding Russian gas might persist, despite new pipeline projects aimed at

circumventing Ukraine or Belarus. Political developments in the Eastern Mediterranean may also limit options for future gas transit to Europe. Gas supplies from the Persian Gulf, feeding the struggling Southern Corridor, would need to cross Syria and are therefore not a viable option at present. Plans to expand the Arab Gas Pipeline and to bring Egyptian gas to Europe via Syria and Lebanon have been put on hold for the same reasons. Adding to that, political crises in supplier regions have the potential to affect the supply situation of EU member states. In the midst of the Arab Spring, turmoil in Libya led several times to a complete shutdown of gas exports to Italy. Libya is Italy's third largest supplier of gas and accounts for 12 percent of the country's total imports (IEA 2012b). The hostage crisis on Algeria's Ardenas gas field in January 2013 is another example of the potential effects of an increasingly unstable political situation in North Africa and the Middle East on gas exports to Europe.

As discussed, the EU has established various initiatives aimed at enhancing diversity of supply and transport routes, and at building partnerships with producer regions (notably the Caspian) and transit countries (notably Ukraine). Many EU member states have also signed up for various planned pipeline projects sourcing from Russia, the Caspian region, or elsewhere (see above). Obviously, the interests of supplier and transit countries are a determining factor in regional political dynamics. Gas producers and pivotal transit states frequently try to play EU member states (and their companies) against each other. For instance, the Interconnector Turkey-Greece-Italy (ITGI), backed by the three countries the pipeline was supposed to connect, and the Statoil-led Trans Adriatic Pipeline—both part of the EU's Southern Corridor project aimed at sourcing gas from the Caspian—have most recently lost against the Trans-Anatolian Pipeline (TANAP). This Azeri-Turkish project is likely to also involve BP, a partner in developing Azeri gas field Shah Deniz II. Meanwhile the Western consortium of Nabucco, a competitor project, disintegrated because of faltering sourcing opportunities and but also because some consortium members opted for alternative projects, such as Hungary's MOL buying into South Stream, the Russian project.

International Obligations

The most important international obligations impacting the EU's natural gas sector stem from the global climate regime. The EU, along with its member countries, signed on to the Kyoto goals

and pledged to reduce its carbon emissions according to the Kyoto Protocol's provisions. As part of this obligation, the EU has made its Emissions Trading System (ETS)—the EU's regional carbon market—compatible with Kyoto's flexible mechanism, notably the International Emissions Trading (IET). The EU also holds the mandate to negotiate for the entire bloc during UN climate talks. Although the Doha talks in December 2012 revealed disagreements within the EU over climate goals, the EU will remain a major driving force of a post-Kyoto arrangement and will continue pushing its climate policy agenda internationally. It will focus on achieving the 20-20-20 targets, which dovetail with the EU's 2009 Copenhagen Pledge to reduce its carbon emissions by 20 percent, and keep on discussing post-2020 targets in the context of the broader Energy Roadmap 2050. In addition, the EU as an organization is signatory to only two energy-specific organizations: the International Renewable Energy Agency (IRENA), which has little impact on the European natural gas sector, and the Energy Charter Treaty (ECT), essentially a trade and investment regime in oil and gas. The ECT obliges the EU and its member states to protect foreign energy investors against key non-commercial risks and ensure smooth transit of energy. Other trade regimes don't exert direct influence on the development of EU's natural gas sector. In addition, the EU coordinates with the International Energy Agency (IEA), the OECD's energy watchdog, on strategic petroleum stocks, energy market data, and efforts to enhance market transparency. Complementing the IEA's regulation on oil, the EU's 2010 regulation on security of gas supply requires member states to maintain strategic stocks in natural gas.

Environmental Concerns and Demand-side Policies

Environmental concerns play an important role in energy policymaking on national and European levels and will impact future gas demand. Environmental policies are likely to exert influence on three fronts.

First, carbon-heavy fossil fuels will see tougher regulation. Most importantly, policies will be geared towards reducing both the relative share of coal in the European power sector and absolute coal consumption levels. Besides introducing tougher standards on coal-fired power plants with regards to conventional pollutants and overall efficiency levels, this may include targeting coal directly through a tax or regulation. Between 2009 and 2012, imports of US hard coal to the EU have more than doubled (European Commission/DG Energy 2012), a function of

cheap unconventional natural gas replacing coal in the US power sector. This fostered discussions about measures to deprive imported coal of its comparative price advantage over gas and renewable in Europe. Efforts will also include a reform of the ETS, the world's biggest emissions trading scheme covering 45 percent of European greenhouse gas emissions.

Oversupply of emission certificates in the market has sent the carbon price below 5 EUR per ton in 2013, which is far from the 30 EUR benchmark commonly considered as the necessary price level to make power generation switch from coal to gas. Both the renewable energy industry and energy-intensive sectors request to reform the ETS and push for planning security regarding future carbon price levels in Europe. As an interim fix, the European Parliament has recently given the green light to “backload” auction volumes, which will take 900 million excess carbon credits off the market until 2018-20 and is expected to raise carbon prices again. Given the ongoing economic crisis in Europe, policymakers will likely avoid putting an additional burden on domestic economies by further increasing energy costs. This will possibly slow down efforts to reduce coal in the energy mix but not put in question the overall trend. Finally, unlike in the United States, tougher CAFE standards will likely not make the European transport sector switch to natural gas. Rather, a combination of plug-in vehicles and a growing electric car fleet might exert an indirect effect on natural gas demand for its role in power generation. So far, however, efforts to electrify the European car sector remain in their infancy.

Second, policies will aim at enhancing energy efficiency levels, particularly in CEE countries. Here, energy intensity is up to 2.5 times as high as the EU average (European Environmental Agency 2013). Improvements in energy efficiency in industry, the residential sector, and services may therefore have a significant effect on energy intensity in this region. A primary target of energy efficiency measures will be buildings, which account for 36 percent of European greenhouse gas emissions. A number of countries have put in place subsidized loan schemes to support high-energy efficiency houses and have made energy efficiency measures part of their economic stimulus packages. The EU uses various instruments and mechanisms within the frameworks of its Cohesion Policy, the Programme for European Energy Recovery (EEPR), and through its research funding channels to support energy efficiency measures in residential and

commercial buildings. Still, given the growing share of natural gas in the overall energy mix, this does not imply that natural gas consumption will decrease in absolute terms.

Third, in line with its 20-20-20 targets, the EU and its member states aim at increasing the share of renewables in the overall energy mix. In fact, renewables are already the largest domestic source of primary energy in the EU, surpassing natural gas and solid fuels in 2010 (Eurostat 2012). RES are typically pushed into the energy mix through a mix of mandates and subsidies (mostly feed-in tariffs). This implies that in the medium to long run, natural gas is assigned the role of a backup fuel to ensure grid stability and to cover peak load (rather than base load). The increasing fiscal burden stemming from RES subsidy schemes has prompted several European countries to adjust financial support downwards. Moreover, in order to streamline the highly diverse range of RES policies deployed across the EU, the Commission aims at coordinating national support schemes and fostering RES trade among member states.

In addition to regulatory policies, innovative technological solutions such as Carbon Capture and Storage (CCS) have entered discussions on decarbonization, notably in the UK. Despite high hopes, it seems that CCS will eventually at best become a complementary element of national decarbonization policies and technologies (Rütters, Heike, and CGS Europe Partners 2013). Financial factors, lack of public acceptance, and regulatory uncertainty put in question the viability of large-scale deployment of CCS, at least in Europe. As a consequence, projected volumes of CO₂ potentially stored by CCS projects in Europe have been decreasing rather than increasing during the last years.

It is important to note that the various possible combinations of these measures and their relative importance in the overall policy mix may imply different or even contradicting roles for natural gas, highlighted also by the 2050 roadmap's five "decarbonization scenarios" (European Commission 2011, 4). One example is the divergence of decarbonization pathways in Germany and the UK, two big GHG emitters which both overachieved on their Kyoto emissions reduction targets (for details on all EU countries, see European Environment Agency 2013). Germany's reduction was primarily a result of enhanced energy efficiency in heating and power production and was supported by the economic modernization of formerly communist East German states.

In the UK, a mix of regulations (such as national emission ceilings for air pollutants), financial instruments (such as the Climate Change Levy), and liberalized energy markets created room for natural gas to replace coal in the national energy mix. Such different pathways may create uncertainty over future demand trends within the gas sector, not only for gas producers but also in the midstream and downstream sectors, and may have repercussions for investment in networks and infrastructure.

Environmental Concerns and Gas Production

Environmental concerns will shape natural gas production prospects in Europe, particularly with regard to shale gas. As available studies suggest, shale gas deposits in Europe are promising, especially in the Carpathian-Balkan Basin stretching across Bulgaria, Hungary, and Romania; the Baltic Basin, which includes Poland and Lithuania; and France's Paris Basin. Denmark, the Netherlands, Germany, and the UK hold deposits as well (EIA 2013). It should be noted, however, that there exists considerable uncertainty about these estimates, notably because of comparatively little expertise in producing unconventional gas in Europe. The latest EIA study corrected earlier estimates and now presents more cautious numbers on available unconventional gas deposits in EU member countries (EIA 2011; EIA 2013, 1-9). A recent British Geological Survey also adopts a more optimistic view on UK-based shale gas reserves than other studies (Andrews 2013). Mindful of these uncertainties, existing deposits may have the potential to make up for the projected decline in the EU's domestic production (IEA 2012a).⁵ Yet, while the Commission retains a more open stance towards shale gas exploration in Europe, several EU member states have turned their back on unconventional natural gas production because of the contested nature of the fracking technology (see also Pearson et al. 2012 for detailed discussions of issues related to regulatory frameworks, land ownership, and market access). Bulgaria, the Czech Republic, France, Luxemburg, and the Netherlands have banned shale gas exploration and production, whereas Germany has suspended any further action in this regard. Poland, Lithuania, and Romania remain open to shale gas, and so does the UK. While energy-intensive sectors are concerned about remaining competitive against comparatively low energy prices in other world regions, notably the US, support for shale gas among the European population remains generally

⁵ As a KPMG report suggests, cost structures of European shale gas are different compared to the US, which—in addition to environmental protection legislation and regulation—is a function of geology. KPMG. 2012. Central and Eastern European Shale Gas Outlook: KPMG Global Energy Institute.

weak. Green parties supported by strong environmental movements on national and European levels call for a Europe-wide ban of fracking, and even conservative parties in some countries (e.g., in Germany) remain highly skeptical. Unconventional gas production will most likely only take place in a select number of countries, and will require long time horizons to account for the interests and concerns of local stakeholders.

Decision-making Structures

In general, regulatory and legal frameworks set the incentive structure for natural gas production in the EU and determine market design. Gas producers, wholesalers, end consumers, and environmental groups try and influence these frameworks through organizing interests. In European countries that have fully privatized their gas sector, investment decisions are generally based on economic fundamentals. In countries retaining strong state involvement investments may be more informed by the public utility model. Even in these countries, however, hard budget constraints (also fostered by the EU deficit rules) ensure that investment decisions remain based on economic grounds.

The gas industry in Europe is well organized and represented both in Brussels and in European capitals. Aside from key domestic producer companies (such as Shell), wholesalers and transmission and distribution companies tend to play the most important role (organized, among other, in Eurogas). Indirectly, external suppliers (such as Gazprom) can lobby for their interests on the European gas market through their wholesale and trading companies (such as Wingas). Major gas consumers such as the chemical industry or end consumers are well organized as well. While consumer groups share a general interest in lower or at least predictable prices, some have formed around normative goals, such as preserving the environment through “green” consumer choices. Environmental groups tend to be strong and well organized in Europe. However, they seem to be split between groups favoring gas as a relatively clean bridge fuel towards long-term climate goals and others opposing natural gas on grounds of it being a fossil fuel and the potential environmental damage coming with its production. In addition, competitor industries to the natural gas sector, notably the nuclear sector in France, occasionally support opposition against shale gas developments.

Since the European regulatory level has significantly gained importance throughout the past decades, the Brussels-based bureaucracy and the European Parliament have become major targets of interest group lobbying. Interestingly, membership in the EU provides domestic actors with more leverage to achieve their political goals, as governmental agencies, businesses, and societal groups can play “two-level games” between the European and the domestic levels. A variety of interest groups have used the EU to foster their domestic agenda, notably in the context of the ongoing debate on fracking.

How Economic and Legal Factors Shape Natural Gas Use or Development

Economic Growth

Economic growth prospects in Europe are seen as relatively bleak in the years to come. IMF analyses suggest that immediate risks for another currency crisis have diminished, but that the European economy will continue to stagnate. The Eurozone continues to perform especially poorly, with growth rates getting back to 1.6 percent by 2018 (IMF 2013). The OECD expects an economic growth rate of 1.1 percent in 2014 and adopts a cautious outlook for the years thereafter (OECD 2013). The EU Commission seconds this assessment and stresses that growth prospects differ strongly across member states, with northern EU countries significantly outperforming southern ones (European Commission 2013c). While long-term projections are difficult to make, the midterm assessment points towards low economic growth rates and persisting risks related to the debt crisis.

As IEA scenarios suggest, gas demand in the EU might continue to grow even under conditions of sluggish economic growth, provided existing policies are maintained and recently announced policies are implemented (IEA 2012c, 572). This is a function of climate-related regulatory measures that should shift some demand from coal to gas. As noted earlier, there is also a risk that contradicting decarbonization policies will lead to demand destruction in gas. An important indirect effect lies in the fact that the economic crisis has dried up available finance for energy infrastructure and projects, despite several EU member states having specifically earmarked energy-related projects in their economic stimulus packages. Overall, the EU represents only 2.5 percent of total public spending in Europe. Efforts to co-fund energy infrastructure projects

through available EU schemes can be further complemented by lending programs of the European Investment Bank (EIB) and other EU-affiliated financial bodies. Still, the bulk of investment will need to come from national public coffers and the private sector. Yet, available evidence suggests that public investments in economic affairs (comprising energy infrastructure investments) have taken a hit in favor of social spending in half of EU member states' budgets since 2007 (European Commission 2012c). In addition, the “credit crunch” lowered bank lending to the private sector in the Eurozone despite record low Central Bank interest rates. Available credit in the Eurozone again decreased by 0.8 percent in 2012 (European Commission 2013c). This trend will likely persist and have knock-on effects on private energy sector investments, both in natural gas and other energy sources such as renewables.

Pricing

Natural gas pricing in Europe is undergoing dramatic changes, away from the incumbent oil indexation system toward spot market pricing. Two factors are causal: the EU's liberalization agenda and international market developments. While the European Commission has not taken action against oil price indexation per se, it has pushed for several measures increasing gas-on-gas competition, notably in the context of the three “Energy Packages.” These measures eliminated destination clauses entailed in LTCs, improved third-party access to gas infrastructure, established secondary markets for pipeline and storage capacity, and eventually allowed second-tier players to emerge as important market actors, challenging incumbent wholesale and distribution companies. The EU's liberalization policies coincided with a surge in domestic natural gas production in the US and rapidly declining import needs in North America. LNG cargoes destined for the US market ended up supplying the European market instead, and LNG imports increased from 49 bcm in 2007 to 83 bcm in 2011 (Eurogas 2007; Eurogas 2012). Coupled with a downturn in international demand, this created a “perfect storm” (Hulbert and Goldthau 2012): the European gas market became oversupplied and emerged a “battleground” of new pricing models, putting incumbent gas utilities and their oil-price-pegged LTC contracts under serious pricing pressure. As a result, the share of European gas imports pegged to oil has faltered (Platts 2013a; Reuters 2012), and the new pricing environment put major European wholesale companies such as Ruhrgas out of business. It also reduced the overall share of Russian gas imports to Europe as spot-traded gas enjoyed a price edge over Russian piped gas,

and European wholesalers were no longer able to take off contractually agreed volumes. In this context, a number of factors created additional pressure on the oil-price link. Notably, Norway's Statoil played an important role in undermining established pricing patterns by offering larger shares of contracted gas at spot prices (RIA Novosti 2010). A high oil price environment accelerated the degree to which Russian imported gas lost competitiveness against imported LNG cargoes. And post-Fukushima Japan, importing a record volume of gas to fill the nuclear gap and facing LNG cargoes priced 11 percent above 2011 levels, started to push for alternative pricing models (Platts 2013b).

In all, however, it is the United States' "shale gas market revolution" that indirectly set in motion important pricing dynamics, which trend away from the decade-old LTC pricing models and are flanked by liberalization efforts pushed by the European Commission. While significant regional differences remain across the EU (natural gas prices differ across the EU, partly a function of pricing provisions varying across LTC contracts), the European gas market is likely to become more spot-oriented, and in the future prices will be determined to a much larger degree by actual supply and demand fundamentals (see also Stern and Rogers 2012 for a detailed discussion on pricing trends on the European gas market). As an import market, Europe will be much more determined by gas-on-gas competition between various suppliers competing for market shares. Major suppliers such as Russia will need to react to this new pricing environment and revisit their own upstream investment decisions. Reluctantly, Gazprom has already started to respond by offering price discounts and providing rebates to European customers. The company apparently also agreed to introduce a certain degree of spot indexation to the pricing mechanism (RBC 2010; Reuters 2010). So far, however, Gazprom remains an adamant supporter of oil-indexed prices and the LTC model. It therefore remains to be seen what new pricing model will eventually emerge, and whether the general move towards gas-on-gas competition on the European gas market eventually implies lower prices or simply more price volatility.

Investment Climate

To a large extent, the investment climate in EU gas production will continue to be determined by above-ground factors shaping cost structures and the economics of exploration and production (E&P) projects. These factors include market regulation, environmental laws, and subsoil resource property rights and are discussed in more detail below. In general, Europe started large-

scale oil and gas production only in the wake of the oil crises of the 1970s. Additionally, only few countries (including the Netherlands, the UK, and Denmark) have developed a sizeable domestic oil and gas industry. In light of this, Europe has less experience in hydrocarbon extraction compared to the US, which translates into lacking or inappropriate regulation—particularly with regard to unconventional gas (and oil) and a lack of service industry in the sector, in addition to geology being less well explored than in the US.⁶

Regarding financial resources, the European energy industry requires external financing for its E&P and infrastructure activities and typically funds them through cash reserves and international financial markets. State involvement remains strong in the case of some major companies operating in the SEM, including Norway’s Statoil, France’s GdFSuez, and Italy’s Eni. These companies may have more privileged access to soft loans or financing at favorable market rates. Because of their public goods characteristics, large-scale infrastructure projects such as gas interconnectors typically involve national or European financial institutions, leveraging risks or supporting the investment through other schemes. As discussed, austerity policies may impact the amount of public support available for crucial infrastructure projects in Europe to connect domestic production with larger gas grids and also across national markets.

Opportunity Costs and Rent Distribution

In general, rent distribution from natural gas does not seem to be a major issue in Europe. In major gas producer countries, taxation regimes and a system of social policies generally ensure a “fair” redistribution of resource rents extracted from the natural gas sector. As the case of Bulgaria shows, however, there is potential for conflict. Parts of the local population felt left out of the economic profit from potential shale gas developments, which led to opposition against E&P projects. In Poland, by contrast, a comprehensive process ensured that the local population was co-opted into shale gas developments, ensuring support and ownership.⁷

⁶ For example, estimates on Poland’s shale gas reserves have recently been corrected downwards by 90 percent (Bloomberg 2012).

⁷ Author interviews.

Market Structure, Access, and Regulation

As a rule, Single European Market provisions ensure that capital can flow freely within Europe, including in the energy industry—a principle the EU will not compromise on in the future. Still, important above-ground factors influence the cost structures and incentives for future investments in natural gas E&P in Europe. Beside above-mentioned problems relating to infrastructure and service industry, a main challenge lies in the regulatory setup.

While EU level environmental legislation applies across the board (through several Environmental Directives and their provisions), most of the regulatory powers relating to exploration and production remain with national governments. As a result, regulation of shale gas development differs widely across the EU's member states. What's more, given the relatively short history of the European natural gas sector, fiscal and taxation regimes are often not in place yet or unsuitable for the needs of an emerging unconventional gas industry. Poland's long-awaited new tax law on shale gas fell short of observers' expectations, and Hungary—the only country in the CEE region targeting shale with specific fiscal provision—provides only minor tax incentives for E&P in un conventionals. The way environmental regulation is implemented makes a difference, too. In Austria, for instance, environmental provisions render shale gas production de facto uneconomic and prevent companies from investing. Adding to these above-ground factors, subsoil resource rights lie with the state in Europe. The EU does not enjoy any power over national laws on subsoil resources. Therefore, there is little incentive for European land owners to support shale gas projects on their property, especially compared to the US, where the individual financial benefits coming with shale gas exploration have been a major enabler of the large-scale deployment of shale gas technology. As the case of Canada reveals, such a setting does not necessarily hinder the development of a sizeable unconventional gas industry. It at least adds another veto player to planned E&P projects in shale gas and alters cost structures. In addition, one-fifth percent of European land is under environmental protection, which, in conjunction with scattered land ownership, limits available land for shale gas exploration.

Still, a recent report commissioned by the EU argues that existing legislation is by and large appropriate to cover the current (low) level of shale gas activities, including authorizations for

exploration and production, water protection, and the use of chemicals (Philippe & Partners 2011). Yet the report argues that regulatory frameworks might no longer be appropriate for scaling up the industry and accounting for large-scale shale gas exploitation. In addition, the various levels of regulation and the existing patchwork of involved authorities can be considered a potential burden on companies and operators. In other words, there exists no common shale gas governance regime that pulls together both EU-level and national regulations governing shale gas exploration and potential production activities. On the national level, Germany, Sweden, and the UK have started to streamline their regulatory procedures. Complementing this, and addressing concerns about environmental hazards and human safety, the EU Commission has launched an initiative aimed at delivering an EU-level risk management framework to provide for “comparable and coherent” regulatory conditions for the exploration and extraction of unconventional gas across the EU (European Commission 2013a). Fearing stronger EU influence, several EU member countries, notably Poland, oppose any EU-wide regulation related to shale gas exploration on the grounds of resource sovereignty.

Countries also adopt different policies toward foreign companies. Poland, strongly determined to foster domestic shale gas in order to end their dependence on Russian gas imports, invited US energy majors ExxonMobil, ConocoPhillips, and Talisman to join unconventional gas E&P projects jointly with state-owned PGNiG and PKN Orlen. Bulgaria, by contrast, withdrew exploration licenses for Chevron at short notice in 2012, making the company leave the country only one year after they started operations. Regarding non-European actors entering the energy market, several mechanisms have been put in place to control third-country firms’ acquisition, ownership, and operation of transmission networks. The most famous provision, the so-called Gazprom clause introduced by the Third Energy Package, entitles national regulators to take “security of supply risks” into account when granting access to non-EU companies. While some EU countries do not object to gas downstream acquisitions by Russian Gazprom (e.g., in the case of Germany’s Wingas), others such as Poland favor their domestic gas industry over foreign companies, particularly in the nascent shale gas sector. Poland is also about Russian influence in companies that are granted E&P licenses in domestic shale gas projects.

Infrastructure Ownership

EU legislation requires companies to unbundle their gas distribution business from infrastructure ownership and ensures third-party access. Some CEE countries, including Hungary, have recently made steps towards recovering state ownership over storage capacities and gas infrastructure. Still, the main provisions of the Third Energy Package regarding infrastructure access and ownership will remain in place.

Scenario Analysis

Looking ahead, four scenarios emerge from this analysis: *Rule Taker*, *Green Power*, *Come and Play*, and *Gas Power*. Each of these scenarios represents a specific combination of the elements discussed above: the EU's liberalization efforts, the EU's decarbonization agenda, supply security and environmental policies on national and EU levels, and the economic crisis. Distinct combinations of these variables directly or indirectly affect the overall demand and domestic supply of European gas, which the following scenario analyses will explain in more detail. Based on this, the likely impact on Europe's regional and geopolitical role will be discussed in detail for each of the four scenarios.

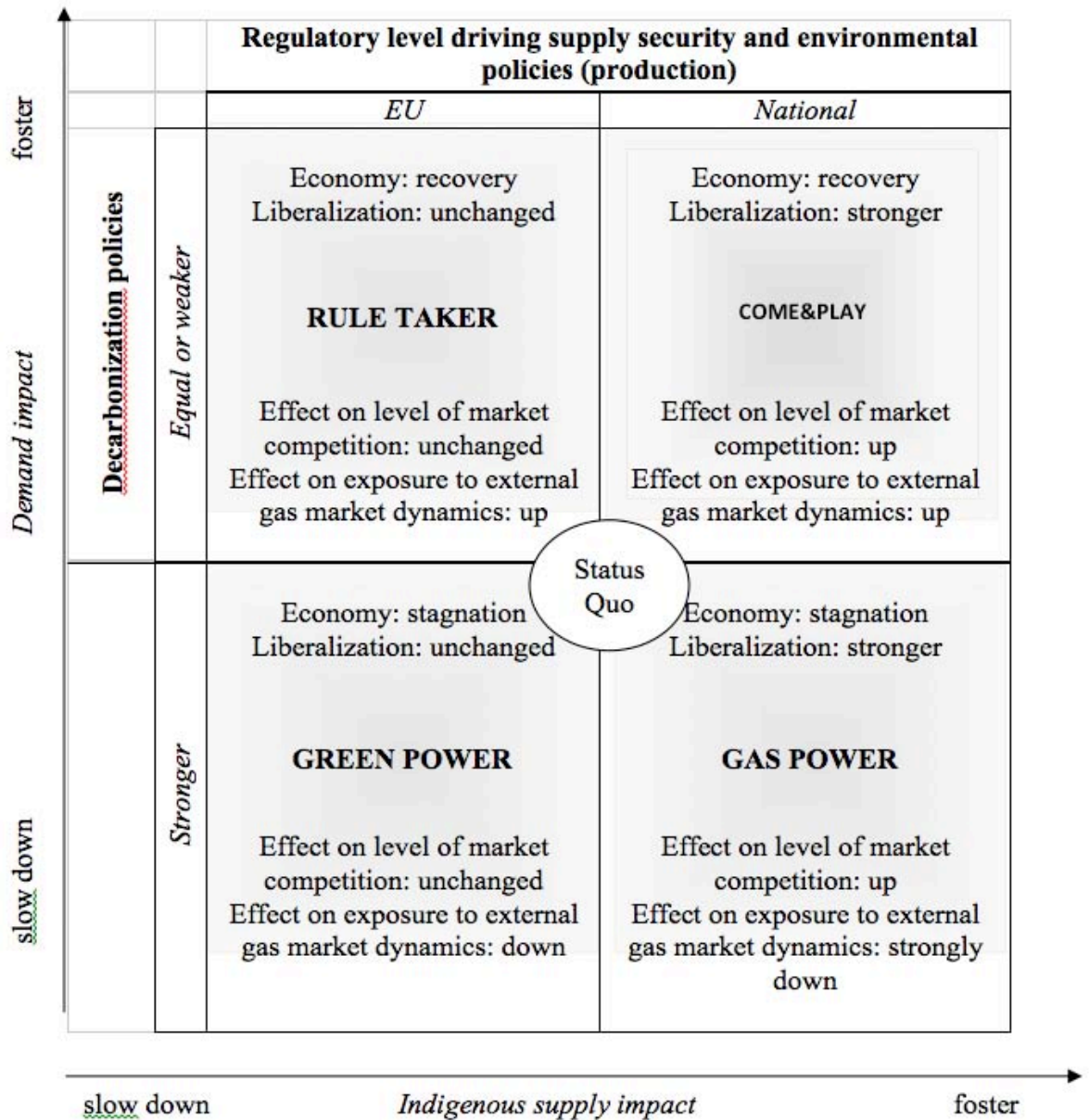
Two qualifiers merit mentioning: First, these scenarios focus exclusively on the effects of events taking place in Europe, and their impact on the development of natural gas markets. The external supply environment and third countries' choices that impact gas production (e.g., the US's decision on gas exports, Qatari investment in LNG, and the future of Russia's current gas export regime, granting a monopoly to Gazprom) are therefore held constant, as they are not subject to political or economic decisions taken by the EU or its member states. Second, scenarios focus on the likely impact on European demand and indigenous gas supply. As mentioned, the IEA projects European gas demand to grow in the coming decades, a projection that is essentially based on extrapolating current trajectories. The aim of the scenarios is not to put in question this or other forecasting exercises, per se. Instead, these scenarios highlight the political and economic factors that can impact the very trajectories that current forecasting exercises are based on.

The four elements informing the scenarios can take the following shape and form:

- A) Liberalization policies: The EU retains its present pro-market stance on natural gas or enforces even more aggressive liberalization efforts. Unchanged policies imply a determined but slow move toward more integrated European gas markets, despite being hampered by member states' actions and sluggish implementation of EU regulation on the national level. Aggressive liberalization efforts include strengthening EU oversight over European gas market operation (e.g., through ACER), pushing privatization of natural gas infrastructure, (e.g., in the context of sovereign debt reduction) and making EU gas markets subject to across-the-board coverage of the competition policy toolbox (vis-à-vis both domestic and external companies operating on EU markets), in addition to fostering crucial “market-making” infrastructure investment.
- B) Decarbonization policies: The EU retains its current decarbonization goals, possibly also compromising on the timeline by which these goals need to be achieved, or adopts even more aggressive climate policies. More aggressive policies include introducing tougher carbon emission targets; channeling additional funds into mitigation measures such as retrofitting houses, smart energy systems, and infrastructure; fixing the ETS and enlarging it toward all sectors; and possibly pushing for CCS deployment.
- C) Supply security and environment-related policies: these policies essentially relate to the question whether the EU will exert influence on national (unconventional) gas developments or not. In the event that the main regulatory authority remains with EU nation states, governments enjoy a great degree of freedom to foster or prevent domestic shale gas production based on national interest. In this case, some front-runners such as the UK or Poland might emerge and effect technology and policy spillover on other EU countries. In the event the EU comes to regulate unconventional gas extraction, comparable and coherent regulatory conditions for exploration and extraction of unconventional gas may allow a more sustainable but also slower development of shale gas across Europe.
- D) Economic strength: this factor can be both a driver and a result of policies. The EU either remains in economic recession, preoccupied with occasionally resurfacing national debt crises. Or the European economies recover—either because the Eurocrisis is overcome, or because the low carbon transition emerges a major driver of economic activity, or both.

The following four scenarios model decarbonization policies and levels of shale gas regulation as the overall determining regulatory factors in a two-by-two matrix. Combined with varying degrees of economic strength and liberalization efforts, four distinct scenarios emerge, depicted in Figure 2.

Figure 2. European Gas Market Scenarios



Scenario 1: Rule Taker

Scenario 1 assumes that EU decarbonization policies remain as they are or become stretched over time in order to support European industry and economic recovery. As a corollary, the European economy picks up again, and so does energy demand. The latter—in line with pre-crisis decarbonization targets—becomes partially reoriented from coal towards gas. At the same time, European authorities in Brussels, in return for compromising on decarbonization targets, seize the opportunity to concentrate more regulatory power over gas exploration and production. In this case, it is to be expected that shale gas developments slow down as European legislative frameworks need to be worked out and national governments can no longer “go it alone.” In addition, EU-wide environmental legislation sees some tightening because key member states such as Germany and France support the anti-fracking camp in the Commission and the EU Parliament, resulting in the ban of chemicals used in the fracking process. Finally, the EU does not introduce additional measures to liberalize gas markets further. Instead, it concentrates on implementing existing regulation (mainly stemming from the Third Energy Package) across the EU in order to consolidate the level playing field in the downstream market.

In this scenario, the implications for natural gas market developments are threefold: 1) natural gas demand will be fostered, 2) indigenous shale gas production is likely to develop only slowly and will not provide sufficient volumes to foster gas-on-gas competition, and 3) the degree of market competitiveness in European gas markets is likely to increase steadily but only slowly.

With regards to geopolitical implications, the EU’s increasing import dependency coupled with slow progress in domestic liberalization expose the bloc even further to external political and gas market dynamics. Its foreign policy is likely to remain informed by national interests and supply concerns. This decreases Europe’s regional or international political influence and makes the Union a *Rule Taker*.

Scenario 2: Green Power

Scenario 2 assumes that EU decarbonization policies are further strengthened as part of a “Green New Deal,” essentially aimed at basing the (presently uncompetitive) continent on a new economic model. As a flip side of introducing tough emission targets beyond 2020, the EU and its member states coordinate and fund large-scale Europe-wide energy infrastructure measures.

Spending is particularly geared towards fostering new industry and services surrounding low carbon technology, smart energy systems, and energy efficient solutions in buildings, industry, and transport. In line with low carbon targets and in order to provide for consistent regulatory incentives across Europe, European regulatory power on gas exploration and production is concentrated on the European level as well. As EU regulatory activities and political struggles with member states become focused on decentralized power systems and particularly the issue of “getting electricity market design right,” the Commission abstains from fostering further measures on the gas market. It continues implementing the Third Energy Package, steadily pursuing a path towards more integrated markets. In this case, it is to be expected that shale gas developments slow down for reasons similar to Scenario 1, and while short-term gas demand might go up because gas is needed as a bridge fuel, tougher decarbonization policies eventually imply lower overall fossil fuel consumption, also in natural gas.

In this scenario, the implications for natural gas market developments are threefold: 1) natural gas demand will take a hit, because the New Green Deal does not exert immediate positive economic effects, in addition to gas becoming the “second-best” fuel for an increasingly green economy (i.e., providing only backup capacity); 2) indigenous shale gas production is likely to develop only slowly and at small volumes; and 3) the degree of market competitiveness in European gas markets is likely to increase steadily but only slowly, as the priority is no longer to “get gas markets right.”

Regarding geopolitical implications, the EU’s import dependency will grow less steeply or not at all. Coupled with slow but steady progress in domestic liberalization, this will force external suppliers to adjust to a new role of supplying a still important European import market, but with the long-term outlook of this market shifting attention away from fossil fuels. This reduces Europe’s exposure to regional or international political dynamics. Rather than seeking alliances informed by energy needs, Europe becomes a rather inward-looking *Green Power*.

Scenario 3: Come and Play

Scenario 3 assumes that EU decarbonization policies remain as they are or become stretched over time in order to support European industry and economic recovery. As a corollary, and in

line with developments in Scenario 1, the European economy picks up again, along with energy demand. The latter becomes partially reoriented from coal toward gas because of European decarbonization targets, and natural gas resumes its role as a bridge fuel. Emerging shale gas producers such as Poland or the UK implement carbon cap policies or tougher emission standards in power production, giving natural gas a competitive edge over coal. Furthermore, these countries foster domestic unconventional production, giving a boost to local economies and a steep learning curve to the emerging European unconventional gas industry. To protect a nascent industry and wary of potentially negative effects of EU legislation on national supply security, existing or prospective gas-producing EU member countries also ensure that regulatory power on gas exploration and production remains in the national domain. As a reaction, and in order to retain regulatory capacity and authority in natural gas, the Commission fosters its liberalization agenda and enacts a “Fourth Energy Package,” essentially aimed at fully integrating European gas downstream markets by 2025.

In this scenario, the implications for natural gas market developments are threefold: 1) natural gas demand will be fostered; 2) indigenous European shale gas production will develop at the pace foreseen in existing projections; and 3) the degree of market competitiveness in European gas markets is likely to increase strongly, supported by additional domestic shale gas production fostering gas-on-gas competition.

In terms of geopolitical implications, the EU’s increasing import dependency further exposes the bloc to external political and gas market dynamics. At the same time, a strong push for gas market liberalization puts an end to incumbent oil price-pegged LTC models. The EU Commission emerges as a powerful regulatory authority for the world’s largest import market, where domestic and foreign gas producers compete on market shares through spot- and futures-based pricing mechanisms. The European gas market becomes depoliticized. External suppliers—including Russia, Qatar, or even US-based producers—find a large and attractive European market, where they are asked to *Come and Play*.

Scenario 4: Gas Power

Scenario 4 assumes that EU decarbonization policies introduce tough emission targets beyond 2020, for the same reasons as in Scenario 2. At the same time, the EU and its member states put in place coordinated “Green New Deal” policies and support new industry and services in low carbon technology, smart energy systems, and energy efficiency. In order to flank this European-level *Energiewende* in a holistic and consistent manner, the Commission decides to simultaneously integrate electricity and gas markets across Europe. For this purpose, it enacts the “Energy Package 2030,” essentially aimed at fully integrating European downstream gas markets by 2025 by ensuring full compatibility with fiscal and regulatory incentives for decarbonizing the power system.

In this scenario, the implications for natural gas market developments are threefold: 1) natural gas demand will take a hit, because the Green New Deal does not exert immediate positive economic effects, in addition to gas becoming only the “second-best” fuel for an increasingly green economy; 2) indigenous European shale gas production will develop at the pace foreseen in existing projections; and 3) the degree of market competitiveness in European gas markets is likely to increase strongly, supported by additional domestic shale gas production fostering gas-on-gas competition.

With regard to geopolitical implications, the EU’s decreasing import dependency reduces its exposure to external political and gas market dynamics. At the same time, a strong push for liberalization, supported by domestic shale gas production, fosters gas-on-gas competition and firmly establishes hub- and futures-based pricing models. The EU Commission emerges a powerful regulatory authority for the world’s largest and highly liquid import market. The European gas market becomes depoliticized. This is the best of all worlds—essentially the *Come and Play* scenario coupled with reduced demand. Though no longer primarily interested in natural gas for fueling its future, the EU eventually becomes a *Gas Power*.

It is hard to judge which of these scenarios is most likely. Approaching this question from the perspective of the major factors influencing the scenarios, however, the following picture emerges: Liberalization efforts are likely to remain constant or become even stronger.

Decarbonization policies are in place and may become more pronounced under certain conditions (for instance, if they are supported by a critical number of committed countries benefitting from low carbon transition, and if policies remain flexible enough to allow laggards to join later—essentially the model for the Schengen Zone or the common currency). By contrast, it remains unlikely that the EU will be able to expand its regulatory power to issues related to natural gas production, including subsoil rights. At the same time, regulatory authority over shale gas production remaining on national levels does not necessarily imply a boom in unconventionals. The biggest wild card, however, remains economic activity—which can be both the driver for additional natural gas demand and the cause for policies along the lines of a “Green New Deal.”

Conclusion

This case study has demonstrated the importance of political decisions and regulation in driving the development of the European natural gas market, and the repercussions that these decisions and regulations have on the geopolitical position of the EU and its exposure to external political dynamics. The study has also highlighted the strong impact that trends on international gas markets have for importers, even for large markets such as Europe. As discussed, the “shale gas revolution” in the US has already impacted the EU’s gas market and is likely to continue, provided that US LNG exports eventually come to fruition. In addition, domestic shale gas production could further erode the dominant position of incumbent market players and their pricing models. For this, however, policy choices taken on EU and national levels will be essential. Much will depend on the EU’s ability to create a true single European market for natural gas. Thus, demand-side and supply-side policies will eventually make the difference in determining whether gas-on-gas competition is stimulated, whether natural gas will have a firm (and affordable) place in the future European energy mix, and what role external companies will play in the European natural gas market.

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