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Articles

The Emerging New Energy Agenda and Russia: Implications for Russia's Role as a Major Supplier to the European Union[1]

Pami Aalto

In this article I will seek to re-examine our commonplace idea of Russia as a major fossil fuels producer with a key role in European energy markets in light of the new energy agenda that has started to emerge during the new millennium. The emerging new energy agenda includes several factors that support such a role for Russia in the future as well, but it also poses several challenges to it.

To set up a basis for this discussion, I first briefly summarize the main factors accounting for Russia's role as a major supplier to the European Union (EU). Next, I map some of the main trends of the emerging new energy agenda that most potently can impact Russia's European role. In the concluding discussion, I will elaborate how Russia is likely to fare within this emerging structure.

Set up in this way, this article proceeds from a relatively uncontroversial perspective on Russia's role as a major energy power in Europe, towards a more future-oriented perspective where by definition we are on weaker ground with regard to making any firm claims. As such this article is offered as a tentative first step on what should constitute a larger collective endeavour in Russian studies and energy policy research, in the absence of academic studies on Russian energy exports and its European role vis-à-vis the new energy agenda.[2] There is, however, a substantial number of more specialized studies on ecological aspects of energy production, climate change, energy efficiency and renewable energy resources in Russia.[3] These studies proceed broadly

1 For supporting the larger research project, which this article initiates, I wish to thank the Slavic Research Center of Hokkaido University and, in particular, my host professor Shinichiro Tabata during a fellowship in June-September 2010, as well as two anonymous referees of the *AIS*. Work for this article was also supported by the Academy of Finland project "Energy Policy in European Integration" (2011-14, no. 139686).

2 For a short paper on the subject, see I. Bashmakov, "'Energeticheskaia effektivnost'' v Rossii i perspektivy eksporta rossiiskogo gaza" [http://www.cenef.ru/file/GasExportsProspects.pdf].

3 See, for example, "Energetika i okruzhaiushchaia sreda," *Energeticheskaia politika* 1 (2009); Anna Korppoo, Jacqueline Karas and Michael Grubb, eds., *Russia and the Kyoto Protocol: Opportunities and Challenges* (London: The Royal Institute of International Affairs, 2006); "Energoeffektivnoe obshchestvo," *Energeticheskaia politika* 5 (2008); and "Vozobnovliaemye istochniki energii," *Energeticheskaia politika* 3 (2008); "Energy Efficiency," *Russian Analytical*

from the perspectives of engineering, energy economics and political science/international relations, which are useful for the current aims. However, they concomitantly do not exhaust the complex policy space at issue, and neither do they fully extend the discussion to the interaction between the new and old energy agendas as attempted here or seek a more general synthesis.

In this article I will focus on the *structural environment* in which Russian actors will have to operate. The structural environment includes both enabling and constraining factors, which means that no structure fully determines actors but rather forces them to make choices. At the same time the structure is multidimensional, which for its part means that the approach has to stay open to perspectives from several disciplines and fields of study in order to accurately analyze those dimensions.[4] For analytical purposes the structure is divided into its *physical-environmental*, *financial*, *informational* and *institutional* dimensions. In this way both the material and social aspects of the structural environment are accounted for. This type of a horizontally broad approach accommodating several structural dimensions of energy policy formation is especially necessary in the context of the "new energy agenda," characterized by the complexities of climate change, other environmental effects of energy production and a turn towards more sustainable energy.[5] My analysis of the structural environment will consider mostly the implications for the Russian government and state together with the Russian energy industry. How will they cope with the changes they are set to undergo, and what implications will that have on Russia's role as a major supplier to the EU?

Owing to the exploratory and future-oriented character of this article, it will not be possible to offer precise predictions drawn from theoretical claims. However, the article opens a new angle on the debate about the extent to which Russia can act as an "energy superpower" vis-à-vis its energy customers.[6] For

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Digest 46 (September 25, 2008); and Indra Øverland and Heidi Kjærnet, *Russian Renewable Energy: The Potential for International Cooperation* (Farnham: Ashgate, 2009).

4 For a related effort developing this approach into a more structurationist direction taking fully into account the structures, actors and their interrelationships, see e.g. Pami Aalto, ed., *Russia's Energy Policy: National, Interregional and Global Dimensions* (Cheltenham: Edward Elgar, 2011); also David Dusseault, "Where Has All the Oil Gone? Contradictions among Russia's Socio-Economic Development, Political Legitimacy and Corporate Profits," in Akira Uegaki and Shinichiro Tabata, eds., *The Elusive Balance: Regional Powers and the Search for Sustainable Development* (Sapporo: Slavic Research Center, 2010), pp. 145–172.

5 Ivan Scrase et al., "Conclusions: Transitions, Governance, Appraisal," in Ivan Scrase and Gordon MacKerron, eds., *Energy for the Future: A New Agenda* (Basingstoke: Palgrave, 2009), p. 225.

6 Marshall Goldman, *Petrostate: Putin, Power, and the New Russia* (Oxford: Oxford University Press, 2008); Andreas Goldthau, "Resurgent Russia? Rethinking Energy Inc.," *Policy Review* (March 2008); Anita Orban, *Power, Energy and the New Russian Imperialism* (Westport: Praeger, 2008); Peter Rutland, "Russia as an Energy Superpower," *New Political Economy* 13:2 (2008); Adam N. Stulberg, *Well-Oiled Diplomacy: Strategic Manipulation and Russia's Energy Statecraft in Eurasia* (Albany: SUNY Press, 2007).

some analysts Russia is a key energy policy actor in the European direction, while its leverage is limited.[7] For others Russian energy policy is coercive,[8] or in fact a "danger to Europe and particularly to the independence of the Central Europeans."[9] In what follows the more moderate views will be supported by offering an outline of what in structural terms will be more and less possible for Russia. Russia's actual energy policies, along with its energy customers, are then to be formulated within the analyzed structural constraints and possibilities. Crucially, the success of any adopted energy policy will be dependent on its capacity to take into account those constraints and possibilities.

The Structure as We Have Known It: Russia's Role as a Major Supplier to the EU

As a subject area pertaining to the use, transport and exploitation of natural resources, and where environmental side-effects are always implicated, energy policy inevitably includes very concrete, material structures. These are best examined upfront so as to avoid the excessive voluntarism in energy policy research that has been in evidence in some writings that make policy recommendations at odds with the possibilities afforded by material structures.[10] We can well refer to this part of the structure by speaking of the *physical-environmental dimension* of energy policy formation.

Concerning that dimension of the structure, we are well aware of how substantial Russia's known fossil fuel resources are. They account for 23 per cent of global natural gas reserves, some 6 per cent of oil, and 19 per cent of coal. Russia also provides 45 per cent of the supply of enriched uranium and accounts for 8 per cent of uranium extraction.[11] The bulk of Russia's confirmed reserves are situated in its European part, in locations such as the Western

7 Jeronim Perovic, "Introduction: Russian Energy Power, Domestic and International Dimensions," in Jeronim Perovic, Robert W. Orttung and Andreas Wenger, eds., *Russian Energy Power and Foreign Relations: Implications for Conflict and Cooperation* (London: Routledge, 2009), pp. 1–20; Stacy Closson, "Russia's Key Customer: Europe," in Perovic et al., eds., *Russian Energy Power*, pp. 89–108.

8 Robert L. Larsson, *Russia's Energy Policy: Security Dimensions and Russia's Reliability as an Energy Superpower* (Stockholm: Swedish Defence Research Agency (FOI), 2006).

9 Keith C. Smith, "Security Implications of Russian Energy Policies," *CEPS Policy Brief* 90 (January 2006).

10 For such unrealistic analysis missing Russia's physical dependence on Europe and its consequences, see Zeyno Baran "EU Energy Security: Time to End Russian Leverage," *The Washington Quarterly* 30:4 (2007), pp. 131–144; Orban, *Power, Energy and the New Russian Imperialism*, pp. 180–182.

11 Government of the Russian Federation, "Energeticheskaia strategiia Rossii na period do 2030 goda," November 13, 2009, no. 1715-p. [http://minenergo.gov.ru/activity/energostrategy/]; Kari Liuhto, "Energy in Russia's Foreign Policy," *Electronic Publications of Pan-European Institute* 10 (2010), pp. 8–11.

Urals, where production has been in progress for decades, and in new energy regions such as the Yamal peninsula, Timano-Pechora and the Barents Sea, where the Shtokman gas fields are located.[12] The majority of Russia's current transportation means for exporting the extracted energy resources also point towards Europe. This concerns especially the pipelines from the Western Siberian oil and gas fields that supply 90 per cent of Russia's total oil and gas exports. The first project wherein Russian gas is produced into liquefied natural gas (LNG) – which can then more flexibly be transported by tankers anywhere where suitable re-gasification terminals are available – only started production in limited quantities in Sakhalin in 2009. As for oil, alongside pipelines it can also be transported more flexibly by tankers, loaded at oil terminals. However, Russia's main terminals in the Baltic and Black Seas are limited to using tankers with a 150,000 deadweight tons maximum capacity, because of navigation problems in the tight Danish-Swedish and the Turkish Bosporus/Dardanelles straits. This makes them uneconomical for export beyond Europe.[13] In short, Russia is physically tied to Europe. As I will argue below, with its abundant fossil fuels, its resource base can well cater to the needs of the EU, which is running out of its indigenous supplies of these resources.[14]

How physical resources are exploited, produced and commercialized into goods to be sold in the energy market depends partly upon prospects afforded by the *financial dimension* of the structure. Here the issue is that no cheaper energy resources have so far been available in large enough quantities for Russia's European customers, which today number 16 out of the EU's 27 members. Gas and oil extraction from the North Sea fields – on which the United Kingdom (UK) and Netherlands have depended since the 1970s – is dwindling. Of the North Sea producers, only Norway will be able to adequately supply the EU over the long-term.[15] However, Norway has been pressed to switch to fields where production is technically more demanding and hence expensive, and cannot expand its natural gas export volumes much, nor cover further big markets beyond its main customers in the UK, Germany and France.[16] To

12 However, less than one-tenth of Russia's eastern Siberia has been explored with up-to-date techniques; see Nina Poussenkova, "Russia's Future Customers: Asia and Beyond," in Perovic et al., eds., *Russian Energy Power*, pp. 134–135.

13 Vladimir Milov, Leonard C. Coburn and Igor Danchenko, "Russia's Energy Policy, 1992–2005," *Eurasian Geography and Economics* 47:3 (2006), pp. 285–313.

14 Indeed, production capacity is not the real problem for Russia; see Masumi Motomura, "The Russian Energy Outlook and Its Influence on East Asia," *Acta Slavica Iaponica* 25 (2008), pp. 67–87.

15 According to Norway's long-term scenario, it can continue production of oil until 2050 and natural gas until 2100, if all "profitable" resources are developed, depending on the ability of the authorities and industry to implement the plans, and pending market conditions; see Government of Norway, report No. 38 to the Storting (2003–2004) "On the Petroleum Activity" [http://www.regjeringen.no/pages/1968338/Stmeld_38_2003-2004_Eng.pdf].

16 Pami Aalto, "European Perspectives for Managing Dependence," in Perovic et al., eds., *Russian Energy Power*, pp. 158–164.

date, Central Asian gas reaches Europe through the Russian pipeline network, where rents paid to Gazprom make it normal "Russian" gas with corresponding prices.[17] Russian actors prefer to clinch high-priced long-term contracts in order to invest in additional extraction and pipeline capacity, and the best such deals have until now been in the EU market.[18] The mutually beneficial financial relationship has been cemented by the good investment capacity in the EU, into which Russian actors need to tap to cover the investment needs of its energy sector of 2.4–2.8 trillion US dollars by 2030.[19] The relationship is also oiled by the Russian-European business deals featuring joint gas pipeline projects such as the Nord Stream in the Baltic Sea and South Stream through the Black Sea, and asset swaps exchanging access to fields in Russia's upstream sector for European companies, to Gazprom's access to the downstream sector in Europe.

Energy policy includes many uncertainties and is to a considerable extent characterized by the role of expectations, insider knowledge, non-transparency and information wars, all of which are factors associated with the *informational dimension* of the structure. Until the 2005–6 Russian-Ukrainian gas dispute, which for the first time reduced Russian supplies to the EU for several weeks, there was an expectation of a growing reliance on Russian fossil fuels in the energy mix of the EU.[20] After that event the signs from the EU have become increasingly mixed in that regard – with political entrepreneurs in the Baltic states and Poland in particular engaged in an information war against excessive reliance on Russia. The materialization of the Nord Stream pipeline project by the Russian and German-led multilateral consortium against vocal opposition, partly relying on environmental and partly on political arguments – and which finally buried the already vague prospect of building the Amber pipeline through the Baltic and Polish territories and removed the need for another trunk of the Yamal-Europe line through Poland – only served to feed these anti-Russian information campaigns.[21] That environmental arguments against the pipeline were found ultimately unconvincing by other northern states is but one example of how actors offer competing information about energy projects.

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17 Small volumes of gas from Azerbaijan to Turkey are supplied through the South Caucasus pipeline.

18 Laura Solanko and Pekka Sutela, "Too Much or Too Little Gas to Europe?" *Eurasian Geography and Economics* 50:1 (2009), p. 72.

19 Government of the Russian Federation, "Energeticheskaia strategiia," p. 76.

20 Pami Aalto and Kirsten Westphal, "Introduction," in Pami Aalto, ed., *The EU–Russian Energy Dialogue: Europe's Future Energy Security* (Aldershot: Ashgate, 2007), pp. 1–22; Susanne Peters, "Courting Future Resource Conflict: The Shortcomings of Western Response Strategies to New Energy Vulnerabilities," *Energy Exploration & Exploitation* 23:1 (2003), pp. 29–60.

21 See Bendik Solum Whist, *Nord Stream: Not Just a Pipeline: An Analysis of the Political Debates in the Baltic Sea Region Regarding the Planned Gas Pipeline from Russia to Germany* [Fridtjof Nansen's Institute Report 15] (2008).

Finally, in terms of the *institutional dimension* of the structure, Russian actors have historically been able to conclude most of the existing supply deals in Europe. Mutual rent-seeking and various business and bureaucratic interests linking the two parties together abound in the institutional game of the Russian-European fossil fuels business. Out of the numerous regions into which the Russian landmass extends, Europe represents Russia's most peaceful borders and in terms of formal institutions is the best institutionalized operating environment with the best governed legal space in this policy area, which otherwise is under-regulated at the international level. This includes the liberalizing European gas market, which Gazprom is able to access whilst at the same time being protected at home because of its gas export monopoly. The institutional structure is supported by the EU-Russia energy dialogue, which has been in progress since 2000 with regular meetings and reports; the EU-Russia "common spaces" project and the EU-Russia Partnership and Co-operation Council involve official and ministerial levels as well as heads of states. This multi-level, well-institutionalized business and political dialogue time and again returns these two partners to the negotiating table to settle their regularly recurring conflicts. Although admittedly the wider institutional context of EU-Russia energy relations is today characterized by renewed, divisive claims to sovereignty over energy security questions and even "energy nationalism" on both sides, in this environment characterized by economic rivalry and utility-seeking, absolute gains suffice and conflict escalation is as a rule kept in check. On the European side the European Commission together with large member states such as Germany, France and Italy help to maintain the energy dialogue, while the European Parliament and several new member states have voiced their fears about too much energy dependence.

Overall, even though rifts have in recent years opened up along the informational and institutional dimensions in Russian-European energy relations, the strong integrationist pull along the physical-environmental and financial dimensions serves to maintain Russia's role in the EU's external energy supplies. Physically, the same Russian gas continues to flow through the pipelines in relatively high volumes. This is accompanied by downward pressures in prices, should they continue to be tied to oil prices, which the International Energy Agency expects to stay very likely between 50 and 100 US dollars per barrel during the 2010s.[22] Hence, today Russian companies supply approximately a quarter of the oil and natural gas needs to the EU and account for 42 per cent of its natural gas imports. In addition, Russia supplies a fifth of the uranium and a tenth of the coal consumed within the EU, and electricity to Finland (in 2009, 14 per cent of national needs). Overall, energy exports provide up to two thirds of Russia's exports earnings and make up some 40 per cent of its federal

22 International Energy Agency, *World Energy Outlook 2009*; for a corresponding Russian estimate, see A. I. Gromov, "Strategic Development of the Russian Gas Industry for the Year 2030," presentation at the seminar "Natural Gas Markets," 2009, Grenoble, France.

budget revenue.[23] The raw figures already suggest a strong interdependence between the two parties. This structure, as we have known it, however, is under pressure from several structural trends moving beyond the information wars and new institutional rifts in EU-Russia relations.

The Emerging Structure: The "New Energy Agenda"

Of the trends challenging Russia's role as a major supplier to the EU, I will mainly concentrate on those that most potently could erode the strong integrationist pull along the physical-environmental and financial dimensions. These two dimensions are especially highlighted in the analysis, because the biggest pressures for the structure to change and for the actors to correspondingly alter their policies currently originate from these directions. The trends to be discussed include the global economic crisis; shift to renewable energy resources, energy efficiency and savings; global climate change; possible switch to unconventional gas; and a return to nuclear power in Europe.

The Global Economic Crisis

The global economic crisis arose from developments within the financial dimension, has been ongoing since 2008, and has had tangible effects on the energy markets. Until the crisis, suppliers like Russia with its "national champion" companies Gazprom and Rosneft were throughout the 2000s increasing their weight at the expense of consumer countries and the traditional western energy majors that had been in the driver's seat for most of the time since the 1980s. Private Russian companies such as Lukoil also extended their positions.

The crisis caused a 1.1 per cent decrease in global energy demand – negative growth for the first time since 1982 – in particular in the OECD countries, while growth in demand continued in China and India. Natural gas demand fell by 2.1 per cent and oil demand by 1.7 per cent. Oil prices fell dramatically from the highs of around 140 US dollars per barrel in July 2008, and stabilized at around 70–80 dollars per barrel by early 2010.[24] Excess capacity commissioned in times of higher prices is expected to keep prices in check for several years, if not more, while volatility may still be considerable. Increased LNG capacity, coupled with a fall in LNG demand in the United States (US) owing to the forcible market entry of shale gas, pushed Russian gas prices out of

23 Philip Hanson, "Oil and the Economic Crisis in Russia," *Russian Analytical Digest* 54 (February 3, 2009); Kari Liuhto, "Energy in Russia's Foreign Policy," pp. 9–24.

24 Alex Forbes, "Crisis Structurally Changes Energy Business," *European Energy Review*, report June 11, 2010, *BP Statistical Review* [http://www.europeanenergyreview.eu/index.php?id=740&id_referer=2070&id_artikel=2070].

the lock-in formula to oil prices in long-term agreements.[25] Some of Russia's European customers violated their take-or-pay contracts with Gazprom, paid the due penalties, and instead bought cheaper LNG from spot markets. This persuaded Gazprom to re-negotiate contracts with some of its clients and to index gas supplied in excess to the minimum take-or-pay thresholds to spot market prices.[26] Nevertheless regional spot market prices remained lower than the price of piped Russian gas.

Because of weakened demand in Europe, Russia had to cut production by 12 per cent (74 billion cubic meters) in 2009.[27] Midterm estimates for gas import needs in Europe have been revised downwards, in some cases by 135 billion cubic meters by 2020. In 2009, 142 billion cubic meters of natural gas were imported from Russia to the EU at the average price of 302 US dollars per 1,000 cubic meters.[28] OECD countries have committed to bolstering energy efficiency and see attaining that goal as a competitive advantage, as does the EU (explained below).[29] From the Russian perspective, the only positive side of this is the easing of supply concerns among its European customers. Many European observers were concerned that Russia might not be able to meet its contractual obligations as they commonly expected Russia's production capacity to fall around 2011–15 as a result of the aging of its western Siberian fields and delays in bringing new fields online, chiefly in Yamal.

In short, a chain of events that started from developments within the financial dimension is leading towards a wider energy market re-structuring, one more in favor of energy consumers at the expense of the previously ascendant producers. And it is also leading to institutional changes in gas contract types. Suddenly, cheaper LNG arriving by tankers from overseas is challenging the traditional supplies of piped on-shore gas of Russian actors. The increase of LNG from Qatar was largely responsible for the oversupply that pushed spot market prices down. Sixty-six per cent of the export plans for 2010 have now been shelved. Reduced supply can help inch prices higher, but a return to the previous market situation is unlikely.[30] Along the informational dimension

25 Jonathan Stern, "Continental European Long-Term Gas Contracts: Is a Transition away from Oil Product-linked Pricing Inevitable and Imminent?" *Oxford Institute for Energy Studies*, NG 34 (September 2009).

26 Forbes, "Crisis."

27 Ibid.

28 "Gazprom Lowers 2010 Europe Gas Export Forecast," *Reuters* (June 22, 2010) [http://www.reuters.com/article/idUSLDE65L1AS20100622].

29 Tatiana Mitrova, "Energy Markets in a Turbulent Zone," *Russia in Global Affairs* 3 (September 2009).

30 I am grateful to Masumi Motomura for pointing this out to me; see also Robert Tuttle, "Qatar, Russia Shutter Natural Gas Supply as Prices Slump: Energy Markets," Bloomberg July 10, 2010 [http://www.bloomberg.com/news/2010-06-10/qatar-russia-shutter-natural-gas-supply-as-prices-slump-energy-markets.html].

Russian actors were ill prepared to foresee these changes. Therefore, the expectations for gas sales in Europe, including Turkey, expressed in the country's energy strategy of 2009 – to jump to 174–186 billion cubic meters by 2015 and to 205–213 by 2020 – will probably have to be downscaled and a new pricing formula be found.[31]

As a consequence of falling sales and prices in Russia's natural resources-dependent economy, the once solid financial situation of recent years has worsened. Russia was one of the countries worst hit by the recession and has been forced to rely on its Reserve Fund, which together with the National Wealth Fund still stood at an impressive 130 billion US dollars in May 2010.[32] Recovery was allegedly taking place already in June 2010, and the gold and currency reserves were on an upward trend again at 460 billion US dollars, after the state had had to defend the ruble vigorously in the crisis.[33] Yet deficit budgeting will be a harsh reality in Russia for many years, combined with lower energy sales revenues. We may witness a renewed demand for and dependence on foreign direct investment in a time when credit is tighter for emerging economies.[34]

Overall, the financial and economic crisis has kick-started a development in which the annual volumes of gas Russia sells to Europe have dropped. Even a prolonged weak demand is possible. On a more positive note, given Russia's still robust financial position and low sovereign debt, the crisis buys more time to decide to whom to sell and when. Yet along the financial and institutional dimensions Gazprom needs to adjust the pricing formula for gas and bolster its relations with those European customers and transit states with whom supply deals are terminating and important pipeline projects are planned. Although along the physical-environmental dimension Russian exporters will continue to be constrained by transport bottlenecks – despite the Russian gas industry looking to invest around half of available funds toward improving and maintaining the transport infrastructure – this is not the biggest constraint they face.[35]

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31 Alexey Gromov, "Russian Gas Project up to Period 2030: Myth or Reality?" presentation in the World Independent Energy Network, April 26–7, 2010, Prague [http://www.energystrategy.ru/stat_analit/stat_analit.htm].

32 Shinichiro Tabata, "The Impact of Global Financial Crisis on the Mechanism of Growth in Russia," *Eurasian Geography and Economics* 50:6 (2010), p. 682; Liuhto, "Energy in Russia's Foreign Policy," p. 51.

33 Dmitry Medvedev, "Speech at St Petersburg International Economic Forum Plenary Session," June 18, 2010 [http://eng.kremlin.ru/transcripts/456].

34 Pekka Sutela, "Talouspolitiikan haasteet kriisin jälkeen," in Iikka Korhonen, Jouko Rautava, Heli Simola, Laura Solanko and Pekka Sutela, *Venäjä kriisin kourissa* (Helsinki: BOFIT, 2009), pp. 26–27.

35 Gromov, "Strategic Development."

Global Climate Change

Along the physical-environmental dimension we encounter another global trend pertaining to climate change and the associated policy response. Institutionally, this is embodied in the Kyoto treaty, attempting to reduce emissions of greenhouse gases (GHG) by 5.2 per cent in industrialized countries from the 1990 benchmark levels during 2008–12. The treaty also introduced flexible mechanisms for attaining this objective. They include joint implementation mechanisms by which industrialized countries invest in emission-reducing projects in other countries and trade in emission quotas for CO_2. The overall goal is to limit global warming to two degrees centigrade. Warming in excess of that is widely regarded as too dangerous for global sustainability. It also endangers food and water supplies for the current population structures.

Along the informational dimension, Russian policy-makers and the majority of the scientific community until recently approached the debate on global climate change with skepticism, although possible economic gains enabled by the Kyoto mechanisms were noted. Russia is a key site for the joint implementation mechanisms. By August 2008, of the 163 joint implementation projects proposed 109 involved Russian businesses, often with considerable involvement of business and institutional actors from the EU. The reason for this interest is the big difference between Russia's actual emissions and its Kyoto-based allowances that rely on the 1990 baseline figures – a time when Soviet/Russian emissions peaked. Since then Russian emissions have fallen by some 40 per cent, and this "hot air" can be sold elsewhere to emit equivalent amounts of GHGs.[36] In the build-up to the Copenhagen climate summit of 2009, where a new treaty to succeed "Kyoto I" was (unsuccessfully) sought for the post-2012 period, the Russian negotiators were reluctant to accept real emission reduction targets so as not to curb the country's economic growth prospects. The counter-information on the EU side was that instead of that negative prospect Russian actors could improve their competitiveness by means of increased energy efficiency and savings.[37]

Russia's climate change doctrine in 2009 introduced a new tone by expecting uninhibited climate change to reduce Russian GDP by 2–5 per cent. Russian president Dmitry Medvedev promised in Copenhagen that his country could meet its target of 25 per cent emissions decrease by 2020. Yet for that to happen he stressed the need for commitments from the developed and developing countries alike. With the prospect of failure, he later went on to threaten Russia's pull-out of the Kyoto process in a meeting with Brazil, China and India in April 2010.[38] This tone expresses a rapid shift in the informational

36 Øverland and Kjærnet, *Russian Renewable Energy*, pp. 4–5, 145.

37 A. Korppoo, Linda Jakobson, Johannes Urpelainen, Antto Vihma and Alex Luta, *Towards a New Climate Regime? Views of China, India, Japan, Russia and the United States on the Road to Copenhagen* [FIIA Report 19] (2009), p. 12.

38 "Medvedev Threatens Russian Withdrawal from Kyoto Agreement," *RIA Novosti* (April 16, 2010).

structures; Russia's energy strategy of 2009 mentioned climate change only once. Nevertheless, it took energy efficiency as one of the four strategic goals.[39] In a related move, in January 2009, the Russian government passed a resolution limiting the flaring of associated gas in oil fields to only five percent of the entire output, set to be in force from 2012.[40]

Hence we find Russian actors reorienting themselves with regard to what we know of climate change and how to correspondingly set policy goals and adopt measures. The Russian approach remains instrumental and defensive, dominated by economic rationality, but when put into practice it will keep Russia in the same boat with its main market partners within the EU, regardless of the strong possibility of losing the "hot air" economic prospects of Kyoto I with any successor treaty. The effects of the new approach to climate change for Russia's energy exports to Europe may at best be indirect and as such vaguely positive in terms of strengthening the informational and institutional dimensions of the Russian-European relationship. This could be accompanied by technology transfers in renewable energy and energy-saving projects in the context of joint implementation projects. However, the tendering process actually employed to pick and approve projects out of the proposals submitted only began in the winter of 2010. At the same time, for example, Gazprom Marketing and Trading, the company's London subsidiary, has been actively involved in global emissions trade since 2006 by coupling gas sales with emissions quotas and by investing in emissions reduction projects abroad to buy emissions rights.[41] EU governments have been particularly keen on buying such "green" emissions rights backed by concrete projects.[42]

The Shift towards Renewable Energy Resources, Energy Efficiency and Savings

Global climate change underwrites a shift towards renewable energy, energy efficiency and savings. As a consequence, what for a long time was a relatively stable fossil fuels reliant energy mix along the physical-material dimension in Europe, which was a guaranteed market for Russian energy majors, is now under pressure. This is so thanks to the new ambitious policy goals and

39 Government of the Russian Federation, "Energeticheskaia strategiia," p. 5.

40 However, this raises serious issues such as the institutional regulation of access to Gazprom-owned pipelines by oil producers; Svetlana Kristalinskaya, "Russia Tackles Associated Gas Flaring," *Oil & Gas Eurasia* (March 2010) [http://www.oilandgaseurasia.com/articles/p/115/article/1143].

41 Andrew E. Kramer, "Gazprom Shifts Its Weight to Carbon Trading," *New York Times* (April 24,2007)[http://www.nytimes.com/2007/04/24/business/worldbusiness/24iht-carbon.5.5427456.html].

42 Alexander Golub, Jos Cozijnsen and Annie Petsonk, "Linking Russia with the European and Global Greenhouse Gas Emissions Trading Markets: Three Paths for Greening the Russian Assigned Amount under the Kyoto Protocol," *Mitigation and Adaptation Strategies for Global Change*14:5 (2009), p. 438.

new technologies created to attain them. The EU member states have agreed to a "20-20-20" target for 2020 of increasing the share of renewable energy sources in the energy mix to 20 per cent; improving energy efficiency by 20 per cent; and decreasing GHG emissions by 20 per cent, possibly rising to 30 per cent if sufficient commitments can also be found globally. In addition, the European Council set a specific minimum target for sustainable bio-fuels to make up 10 per cent of the overall petrol and diesel consumption.[43] At the same time, we should acknowledge that these environmental and climate policy commitments of the EU also in part represent an institutional response to the 2005–6 Russia-Ukraine gas crisis and similar events that have since then occurred, almost on an annual basis, between Russia and Ukraine or between Russia and Belarus, prompting the EU's efforts to diversify its energy supply to avoid over-reliance on Russian fossil fuels.

Although the EU is currently far behind its ambitious targets in renewables, Europe overall is practically for Russia the only market where environmental goals pose serious questions to its energy exports. As for Russia's other big markets, the countries of the Commonwealth of Independent States (CIS) have been relatively inactive in this field, despite having considerable renewable energy potential and high energy intensity levels.[44] In Asia, where Russia's emerging energy markets are, China is rapidly entering solar energy production. In 2009 it became the biggest producer of photovoltaic solar cells, most of which, however, were exported. Its domestic output of photovoltaic solar cells has grown from 100MW in 2005 to 2GW in 2008. Although most of this goes for export, China's own installed capacity is expected to be at 10GW by 2010 and 20GW by 2020.[45] In 2009 China installed 13GW capacity of wind power, having doubled its capacity each year since 2005 and is set to become the world's largest wind energy power producer by 2017.[46] However, with its impressive renewable energy projects (unlike the EU) China is not looking to diversify away from Russian energy supplies. Rather, because of its rising demand, it plans to promote domestic renewable sources *and* to use Russian fossil fuel supplies to lessen its reliance on the Middle East. The Middle Eastern supplies come at a premium of about one dollar per barrel because of the treacherous seaway transport routes through the Malacca and Hormuz straits. Moreover,

43 European Commission, "20 20 by 2020: Europe's Climate Change Opportunity," Communication from the Commission to the European Parliament, the Council, the European Economic And Social Committee and the Committee of the Regions, Brussels, January 23, 2008 Com (2008) 30 Final.

44 Thomas Legge, "Opportunities for Biofuels and Biomass in the Region," *Climate Change* 10 (2008).

45 Stefan Nicola, "A Solar Revolution at the IAE," *European Energy Review* 4 (June 2010) [http://www.europeanenergyreview.eu/index.php?id=2044].

46 Stefan Nicola, "Wind Power Goes Mainstream – and Feels China Breathing down Its Neck," *European Energy Review* 18 (June 2010) [http://www.europeanenergyreview.eu/index.php?id=2090].

China's forthcoming larger scale supplies from Russia's Eastern Siberia and Sakhalin will build on the modest amounts of railway deliveries of oil up to 2009. By contrast, in Europe, Russian energy in its various forms may already have exceeded 20 per cent of total primary energy consumption.[47]

Russia itself has considerable potential in the field of renewable energy, energy savings and efficiency. Along the physical-environmental dimension, the economic potential for development of renewables could, according to Pavel Bezrukikh, cover 35 per cent of Russia's total primary energy consumption[48] and, according to Viacheslav Kulagin, 25 per cent of annual consumption.[49] Today much less, about one per cent of total primary energy supply comes from "unconventional" sources – mainly peat that in Russia is usually counted as a renewable resource. A few additional percentage points come from large scale hydropower built during the Soviet era. Some three to four per cent of heat supply come from waste and wood burning.[50] The turn to renewable energy is a daunting task merely along the physical-environmental dimension, because infrastructure demands are huge. However, in the field of biomass – in its various forms – Russia is the world's largest producer. Technical potential is high for wind and solar power in certain regions. The economic potential overall is best in geo-thermal, small hydro and biomass, the latter two of which are in the "pipeline" to be implemented more widely in Russia, chiefly in remote locations not connected to central networks and where fossil fuels are now transported from afar at high costs.[51] Russia's goal is to inch towards the role of renewable energy supplier and developer, on top of large-scale hydropower, in electricity generation to 4.5 per cent by 2020,[52] and in Medvedev's words, become a "leader in developing innovation both in traditional and alternative energy."[53]

The potential for increasing energy savings and efficiency is estimated at 45 per cent of total the primary energy supply. When implemented, this could pave the way to an increase in fossil fuels export revenues amounting to 84–112 billion US dollars.[54] To this end Igor Bashmakov called for an "alliance" (*soiuz*) between energy efficiency experts and the gas industry, with a strong development role for the state.[55]

47 Liuhto, "Energy in Russia's Foreign Policy," p. 25.

48 Øverland and Kjærnet, *Russian Renewable Energy*, pp. 7–8.

49 Vyacheslav Kulagin, "Energy Efficiency and Development of Renewables: Russia's Approach," *Russian Analytical Digest* 46 (September 25, 2008), p. 6.

50 Government of the Russian Federation, "Energeticheskaia strategiia," p. 75.

51 Øverland and Kjærnet, *Russian Renewable Energy*.

52 Government of the Russian Federation, "Energeticheskaia strategiia," pp. 110–111.

53 Dmitry Medvedev, "Presidential Address to the Federal Assembly of the Russian Federation," November 12, 2009 [http://eng.kremlin.ru/transcripts/297].

54 A. I. Gromov, "Energy Strategy of Russia for the Year 2030: Approaches, Priorities and Reference Points," presentation in conference "Energetika XXI: Economy, Policy, Ecology," October 15–16, 2009, St. Petersburg, Russia.

55 Bashmakov, "Energeticheskaia effektivnost'," p. 5.

The main opportunities for Russia in this context include the ability to reserve more fossil fuels for export by lessening their share in the domestic energy mix. By contrast, the potential for Russia to trade in the European renewable energy market may be limited to technological and scientific exchanges in fields such as solar cells and hydrogen.[56] As already noted, the goal of increasing the share of largely domestically available renewable energy in the European energy mix also represents an institutional response to increasing external energy dependencies. In this light it is not a viable idea to boost Russian energy exports, or compensate for any possible problems in fossil fuels exports by means of Russian biomass sales to European markets. With an eye on electricity generated from renewables, it must be noted that electricity transmission capacities between the EU and Russia are limited too. The European Commission's aim has for long been to eventually create a pan-European electricity market, but the member states bordering or in close geographical proximity to Russia have aimed at distancing themselves from Russian networks. In the spring of 2010, the Finnish Parliament approved the government's recommendation of giving licenses for two new nuclear power plant projects, partly to reduce the country's reliance on Russian electricity imports. To lessen the Baltic states' reliance on the Soviet-era centralized electricity network, and to open up export channels to the Nordic states, small scale cable projects between Finland and Estonia have been implemented.

In the final analysis, it is reasonable to expect that the European trend towards renewable sources of energy, and energy efficiency and savings, will have an impact on Russia's export potential to Europe and that Russia itself faces huge constraints along the physical-environmental and financial dimensions when its prospects for promoting renewable energy are taken into account. *If* the EU's targets are attained, we may eventually see at least some of the dwindling North Sea production compensated by means of renewable energy production within the EU. The renewable energy targets set for the EU's biggest gas and oil producers, the UK and Netherlands, foresee a jump in gross final consumption from one to 15 per cent and two to 14 per cent, respectively, by 2020.[57] The UK has since 2004 been a natural gas importer in rapidly increasing quantities, and the Netherlands has long imported oil.[58]

The UK and Dutch examples show how fossil fuel supplies will continue to constitute a large part of Europe's consumption for decades to come, and how imports will play an increasing role. Nevertheless, Russian actors must overcome a maturing or a slowly growing European export market. Variation among EU member states will also be great. For example, expecting natural

56 Øverland and Kjærnet, *Russian Renewable Energy*, p. 16.

57 European Commission, "Renewable Energy: Targets" [http://ec.europa.eu/energy/renewables/targets_en.htm].

58 European Commission, "EU Energy in Figures 2010" [http://ec.europa.eu/energy/publications/doc/statistics/part_2_energy_pocket_book_2010.pdf].

gas to constitute a major part of Northern Europe's energy mix, many of the region's states will have to rely on Russian gas owing to the very slowly improving LNG facilities there. Southern Europe has more alternatives. In particular, Spain and Portugal can probably manage without Russian gas owing to their North African gas supplies and LNG. Investments into new pipeline infrastructure such as the Nord Stream pipeline (to be completed in 2011), the Yamal-Europe/Northern Lights through Poland (completed in 2005), and possibly the South Stream by 2015, in addition to numerous existing and planned oil pipelines, will represent further "lock-in" factors. In short, Russia is in no big hurry to diversify the bulk of its exports, though questions of volume do exist. Yet its moves towards the Asian market make sense as a long-term strategy.[59] A greener energy policy in Europe will not make Russia lose its main regional market in Europe, but it will facilitate the maturing of medium and long-term demand, and may suggest that overall limits to the geographical expansion of this market are in sight.

A European Switch to Unconventional Gas?

The expansion of unconventional gas production in the US made the country the largest natural gas producer in the world in 2009, covering 46 per cent of its gas output in this way. Roughly half of that was shale gas and half coalbed methane.[60] This has posed the question of whether the new technology that has made the US revolution possible could transform the physical base of energy policy-making in Europe, with potentially dramatic implications for Russian natural gas exports.

The European Commission together with the International Energy Agency (IEA) estimate the total recoverable reserves of unconventional gas in Europe to be between 33 and 38 trillion cubic meters. The conventional gas reserves are put at a mere two trillion cubic meters.[61] Russia's "expected" conventional gas reserves stand at some 164 trillion cubic meters and "proved balance reserves" at 48 trillion cubic meters.[62] Hence, in terms of pure volumes the estimated European reserves could compensate for an important part and even substitute Russian fossil fuels within the EU for several decades, *if* they could be effectively utilized.

Herein we find several constraints to overcome across each of our four structural dimensions. Along the physical-environmental dimension these unconventional resources are scattered along wide areas in Northern Europe

59 Russia expects to inch its share of oil exports to Asia from six per cent to 22–25 per cent, and gas from zero to some 19–20 per cent by 2030; see Government of the Russian Federation, "Energeticheskaia strategiia," p. 10.

60 Rik Komduur, "Europe Not Ready for Unconventional Gas, Yet," *European Energy Review* 21 (June 2010) [http://www.europeanenergyreview.eu/index.php?id_mailing=91&toegang=54229abfcfa5649e7003b83dd4755294&id=2095].

61 Ibid.

62 Government of the Russian Federation, "Energeticheskaia strategiia," p. 41.

from Germany and Austria to Sweden; in the UK; in Eastern Europe, as well as southwestern France, Portugal and northern Spain. Many of these areas have a high population density, unlike the more easily exploitable reserves in the US. The environmental effects of the hydraulic fracturing technique – which involves pumping water and sand in high pressure some two hundred meters underground into the shale rock to release the gas and then collecting it – have prompted concerns about the effects to drinking water quality. In the US in the spring of 2010, the Environmental Protection Agency moved to examine these concerns.[63] Further concerns can be expected in Europe where environmental considerations have been an integral part of energy policy for a long time.

In terms of the financial dimension, commercially viable unconventional gas products may not be expected in Europe perhaps until 2020. The eventual prices will likely be higher and profit margins lower than in the US. In real terms some estimates put the costs in the US to some 265–283 US dollars per 1,000 cubic meters. In Europe a real question arises on the ability to compete with piped gas and LNG. The lack of service industries and the consequent time-lags involved in creating economies of scale in Europe also mean high costs at least until the very long term.[64]

In terms of the informational dimension, the very rough nature of the current estimates of reserves constrains any decisive policy measures in the absence of up-to-date, bottom-up research on the geological structures wherein the resources are located. The expectations of the required techniques rely on experiences in successful North American fields such as Barnett in Texas, which may not even be well transferable to other US locations, let alone Europe. We already have the example of the Hungarian Mako with supposed reserves of 600 billion cubic meters, where ExxonMobil and Mol gave up their license after testing several wells.[65]

The institutional dimension poses challenges as well. Land owners sitting on top of the deposits will not benefit automatically in Europe as they do in the US, and may oppose the installation of up to 12 wellheads to be built per square kilometer. A fitting solution will have to be found in each EU member state where the resources are developed. New supplies always need access to existing transport grids and hubs, which call for further gas market regulation and liberalization.[66] Finally, the weighty institutional and political resources invested in existing long-term contracts and LNG facilities represent severe competition.

63 Konstantin Rozhov, "Should Gazprom Fear Shale Gas Revolution?" BBC News, April 8, 2010 [http://news.bbc.co.uk/2/hi/8609131.stm].

64 Komduur, "Europe Not Ready for Unconventional Gas, Yet"; Svetlana Kristalinskaya, "Russia Weighs Its Options as Shale Gas Wave Hits Europe Part 2," *Oil and Gas Eurasia* 6 (June 2010) [http://www.oilandgaseurasia.com/articles/p/121/article/1220/].

65 Komduur, "Europe Not Ready for Unconventional Gas, Yet."

66 Ibid.

The Russian approaches have so far been cautious. Gazprom plans to start pilot production of coalbed methane in Kemerovo's Kuzbass coal basin in 2011. By 2016 the production could turn commercial and feed the region's needs, with production eventually topping four billion cubic meters annually.[67] Some companies are pondering investments in technology to access US markets in order to learn more about how to utilize the potential of their own reserves. Russian President Medvedev may share these views. Yet some experts doubt the commercial viability of the technology, which provides a much shorter lifespan coupled with a much larger investment for the fields than the exploitation of conventional natural gas resources.[68] Russian Minister of Natural Resources Yuri Trutnev indicated that his and Gazprom's position is defensive, as shale gas threatens a sea change in gas markets.[69]

We may nonetheless expect the demand for gas, still an abundant and the most environmentally acceptable fossil fuel, to stay put or even increase in some parts of Europe. This would mean a continued need for Russian gas exports to Europe alongside LNG and other supplies. The constraints on unconventional gas are such that it can only become a competitor in the very long run.[70] Also, here we are only speaking of prospects of the gas industry. Unconventional gas does not impact Russia's oil supply as much, because oil is not much used for power generation in Europe.

A Return to Nuclear Power

We may finally consider the renaissance of nuclear power in Europe, in the face of climate change concerns and notable development work on nuclear safety and operating standards since the Chernobyl nuclear accident in 1986. Admittedly, the issue of handling nuclear waste is very differently addressed across countries, with Finland and Sweden among the leaders in developing long-term storage facilities. This problem notwithstanding, nuclear power promises acceptable running costs once the facilities have been built – in Finland's case, however, the construction of the country's third nuclear power plant in Olkiluoto was delayed a few years until 2012 (or even 2013) and will cost at least 50 per cent more than planned.[71] The European Commission has not become a strong advocate, despite having started to mention the nuclear option in its regular documentary output. Currently in Bulgaria, Finland, France and Slovakia construction projects are underway. Italy and the UK have

67 "Gazprom to Launch Coalbed Methane Pilot Production in Kuzzbass in 2011," *RIA Novosti* (June 28, 2010) [http://en.rian.ru/russia/20100628/159606463.html].

68 Kristalinskaya, "Russia Weighs Its Options."

69 Anton Doroshev, "Russian Minister Says Shale Gas a Problem for Gazprom," *Reuters* (April 19, 2010) [http://www.reuters.com/article/idUSLDE63I1LS20100419].

70 cf. Indra Øverland, "The Surge in Unconventional Gas: Implications for Russian Export Strategies," *Baltic Rim Economies* 1 (2010), p. 19.

71 Reiner Gatermann, "The Finnish Way: Nonprofit Nuclear Power," *European Energy Review* (May 12, 2010) [http://www.europeanenergyreview.eu/index.php?id=1967].

committed to launching nuclear power plant projects and several other states are contemplating them. In June 2010, Sweden's parliament turned the 1980s decision of gradually phasing out nuclear power on its head by deciding to commission more capacity. This was after Sweden gradually became Russia's oil and Denmark's gas customer, and following a failed project to build a new cable to import electricity from Russia in 2006.

The IEA estimates that in a positive scenario for the nuclear power industry, it can only make a maximum of one-tenth contribution to carbon savings on the global scale by 2050. While uranium itself is a plentiful resource, the nuclear industry simply cannot build enough plants even with political backing. Moreover, just as unconventional gas cannot compensate well for the needs of oil supply, nuclear power cannot do much to that effect either, as long as the transportation system relies on liquid fuels. At best, it can reduce its share of coal and natural gas in power generation.[72]

Russia is upgrading its existing nuclear reactors and is planning to build some two to three new reactors a year until 2020. It is also starting to test closed fuel cycle technologies, and examine fusion techniques and fast neutron technologies. These measures are adopted to prepare for higher domestic energy consumption that may follow from a reawakening of economic growth, to make Russian nuclear technology more competitive in export markets, and again, to reserve more fossil fuels for export. Interestingly, Siemens AG, a German industrial group, is withdrawing its 20 per cent holding in the French Areva and is instead launching a joint venture with Russia's Rosatom.[73]

Examining the large-scale needs of the expected nuclear renaissance in Europe in a landscape of insufficient industrial capacity available for the construction of the new plants, and nuclear power's non-competitive nature vis-à-vis oil, it is possible to foresee Rosatom and thereby Russia benefiting from the situation. In fact, Russian actors may have much to gain in terms of establishing a less fossil fuels centred presence in Europe through nuclear materials related trade. However, this definitely presupposes a lot of activity within the informational dimension to overcome the Chernobyl image that is still vivid in many parts of Europe.

Concluding Discussion

The new energy agenda is to a great extent driven by trends within the physical-environmental dimension of energy policy formation. At the centre is global climate change. We also witness new technologies and materials improving the applicability of renewable energy resources, and enabling greater

72 See Francis McGowan et al., "Global Energy Solutions?" in Scrase and MacKerron, eds., *Energy for the Future*, p. 210–213.

73 World Nuclear Association, "Nuclear Power in Russia" [http://www.world-nuclear.org/info/inf45.html].

energy efficiency and savings; the introduction of unconventional gas; and the return of nuclear power into the energy mix. When such big trends occur within the normally slowly changing physical-environmental dimension, we may speak of a paradigm change from an old to a new energy agenda. This is likely to take a long time. Its precise features are difficult to predict because of the constraints we face along the informational dimension. Not only are there business secrets and classified and unpublished reports, but also constraints in our calculations and scenarios, because the assumptions going into them frequently rely on uncertainties and include many not easily controllable link-ups.[74]

Against this physical-environmental background the financial constraints regarding the realization of the new energy agenda are significant. On this plane, the global financial and economic crisis is a conjectural phenomenon, which nevertheless could spark some of the discussed big trends in energy production, exploitation and use. For Russia, combating the effects of the crisis on its energy exports constitutes a chief task in the next few years. All of this has to be made comprehensible and dealt with along the informational and institutional dimensions. But the interesting point is that unlike in the information wars and institutional rifts in Russian-European energy relations that have opened up, especially since 2005–6, the current change originates in new patterns within the material basis of energy policy through the technologies used to exploit resources and the material consequences flowing from them. Institutionally, the new energy agenda presupposes new international and regional regulations, whilst some of the new domestic-level solutions such as renewable resources lessen the need for international trade in primary energy resources.

Although a paradigm change is underway in global energy policy and Russia must face that new agenda too, we must conclude that it will not be a full-scale revolution because of several "lock-in" factors. These create considerable inertia in energy policy-making, because decisions made yesterday and today will have consequences spanning decades.[75] The lock-in factors are especially strong in Russia's main market area in Europe. They include extensive and expanding oil and natural gas pipeline infrastructure linking the EU and Russia; new investments in LNG facilities – a field in which Russia is set to become a weightier actor in the next two decades by converting 10–15 per cent of its exports to LNG; existing long-term gas contracts; and mere geographical proximity, linking the fossil fuels resource impoverished EU and the abundantly fossil fuels rich Russia naturally with each other.

In terms of policy, how is Russia likely to fare within this emerging dual structure in which the old and new energy agendas co-exist? In perfect struc-

74 Gerald Foley and Lönnroth, Måns, "The European Transition from Oil: Mapping the Landscape," in Gordon T. Goodman, Lars A. Kristoferson and Jack M. Hollander, eds., *The European Transition from Oil: Societal Impacts and Constraints on Energy Policy* (London: Academic Press, 1984), pp. 6, 16, 19–21.

75 Scrase et al., "Conclusions: Transitions, Governance, Appraisal," pp. 225–226.

tural conditions Russia *could* assume a dual role by capitalizing on and developing its fossil fuels sector further, whilst simultaneously diversifying its repertoire. This is an option worth contemplating for Russian actors. However, to defend their market positions in Europe, Russian energy companies have to be able to maintain sufficient production. In the oil sector where Russian resources are more limited and new fields more difficult to exploit, Russia's chief policies along the institutional dimension have strengthened the role of the state, for example, in licensing policy. In the gas sector, Gazprom's healthy budgets and the increasing output of independent producers make production outlook more promising. However, it seems clear that the pricing formula of gas needs to be adjusted to the demands of the changing European market.

Russia's centralizing policies so far in its energy sector prevent it from fully benefiting from its natural competitive advantages within the old energy agenda. By contrast, in the new agenda the state indeed needs to act decisively owing to the investment challenges along the financial dimension and the need for regulation as far as the institutional dimension is concerned. Here Russia's centralization and the proceeds from its continuing energy trade help it to implement the necessary reforms. Structural constraints are, however, numerous. At the same time, the continuation of fossil fuels proceeds may also encourage old habits, as long as they keep working.

Our prevailing thought patterns, limited information processing, and low predictive capacities represent the constraining qualities of the informational dimension and frequently prevent us from fully realizing all possible policy goals. As a thought experiment, Russia and the EU could consider the co-existence of the old and new energy agendas as an opportunity to improve their mutual relations. So far the intense fossil fuels trade structure has tied the two parties together. That has, however, failed to properly spill into other sectors of the relationship, help decisively with Russia's modernization and clinch a strong enough European role for Russia that the Russians think they deserve. The emerging dual agenda may afford more platforms for "safe" EU-Russian technical cooperation for steering and deepening their mutual relationship.

With an eye on the energy superpower debate within the emerging dual structure, Russia is not becoming a threatening energy superpower that can easily subject Europeans to its will, and neither is Gazprom actually close to becoming the world's largest and most powerful company, able to spread fear in Europe and beyond. The emerging structure enables Russian actors to continue to benefit from the old agenda, within the limits discussed; to diversify the economy sensibly without giving up the natural strengths; and to participate more meaningfully and in numerous fora in international cooperation, research and development work. This promises more prestige for Russia – something that it has historically sought. Such prestige would also resonate well in many EU capitals.