

THE CHANGED GEOPOLITICS OF ENERGY AND CLIMATE AND THE CHALLENGE FOR EUROPE

A GEOPOLITICAL AND EUROPEAN PERSPECTIVE
ON THE TRIPLE AGENDA OF COMPETITION,
ENERGY SECURITY AND SUSTAINABILITY

BY ALBERT BRESSAND

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SUMMARY

The Changed Geopolitics of Energy and Climate and the Challenge for Europe: A geopolitical and European perspective on the triple agenda of competition, energy security and sustainability¹

The world energy system is undergoing a far reaching transition in which three agendas collide: *an economic agenda* of supply and demand and of national competitiveness; a *security agenda* reflecting strategic dependence on trade in oil and gas; and a *sustainability agenda* now centered on the search for a low-carbon energy mix. Rapid growth in emerging and developing economies adds urgency to this triple agenda while the oil-and-gas-renaissance in North America challenges a number of accepted tenets on the future energy mix. How this triple agenda is addressed will have a major influence on global economic growth, on trade flows, on the state of the planet, and on the relative wealth and power of nations. Once centered on relations between oil producers and oil importers, the geopolitics of energy is redefined in this broader, multi-source arena in which different countries make contrasted policy choices. Hydrocarbons remain central to the global energy mix but competition among energy sources intensifies, a trend accelerated by the increasing share of energy used in the form of electricity. The tensions, or 'trilemma', between economic development, energy security and sustainability are an omnipresent consideration; Governments play an essential role in setting priorities among these three objectives and in making decisions that greatly influence the working, or sometimes the creation and/or design of markets.

The present paper seeks to identify the key players and their strategic postures in this new era of energy geopolitics, with a view to drawing implications for the European Union and the U.S. Reflecting a cost-benefit analysis informed by global criteria, the thrust of the conclusions regarding Europe is far less optimistic than is the case in

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prevailing views that tend to define success in a self-referenced, Europe-centric manner. Focused on meeting targets it set for itself with little consideration for other countries' strategies, Europe displays what one might label 'parochial universalism'. Gains tend to be assessed with reference to the world as Europeans would like it to be rather than as it is. Adopting a geopolitical perspective rather than a moral standpoint – more generally a relative rather than absolute standpoint – alerts one to the risk for Europe of a 'policy lock-in' in which means become end in themselves. The U.S. is also exposed to its own forms of parochialism around the oxymoron of 'energy independence', yet the successful development of its own resources notably of natural gas presents it with clearer opportunities. The latter can be leveraged in ways benefitting the country as well as global progress on all three objectives of market-driven competition, energy security and affordable sustainability.

Which countries are in a position to influence the global energy system is therefore our starting point in this inquiry. Having identified the 'Energy seven' ('E7') countries with the highest influence on energy and climate relations across energy sources, we briefly discuss the thrust of energy policy development in Saudi Arabia, Iraq, China and Japan, four countries we see as 'status quo' countries in terms of their core policy stance regarding the global energy system and markets. Obviously, the size and rapid growth of Chinese energy demand is a major source of change but China nevertheless pursues her own development objectives, including decarbonization from a very high level, at her own pace rather than in light of global objectives. We then show how the Russian Federation and the European Union are the two 'E7' players intent, for very different reasons, on changing the game. While Russian efforts to use energy as a tool of foreign policy are fairly straightforward, Europe has put in place comprehensive, ambitious policies to address all three dimensions of the present energy agenda. This is done most notably through the Internal Energy Market (IEM) and through the Energy and Climate Directive. Often presented as two faces of the same coin, these two instruments were developed in very different political contexts and reflect contrasted political and economic philosophies. The IEM is an echo of the 'Europe 1992' internal market and of its emphasis on rolling back the role of governments, national champions, rents and subsidies. The 2008 Directive, by contrast, reflects the type of environmental agenda that seemed about to gain universal acceptance on the way to the Copenhagen climate summit when governments were invited to come together and tilt the playing field toward a greener, decarbonized future. Copenhagen having left it isolated – indeed, physically absent from the key drafting room – Europe is left with two instruments that are no longer part of a common global architecture and may therefore be more often at odds than it is pleasant to acknowledge.

Why concrete results are disappointing when assessed against the founding objectives of European energy policy compared to the costs incurred, and why European moral leadership on sustainability issues fails to translate into global leadership and economic advantage is our next set of considerations. Highlighting the impressive start towards a comprehensive, pace-setting set of European energy and climate policies in the previous decade, we come to a more sober assessment of the enlightened but often inefficient policies that have developed from this 'big bang'.

The IEM, by construction, does not provide for free movements of essential factors of production since technology choices and investment decisions toward a country's 'energy mix' remain a national choice. A poorly designed and bureaucratically steered Emission Trading System for Greenhouse gases (EU ETS) similarly fails to provide the overarching market signals that could be expected to fuel a self-igniting and economically efficient energy transition. A surprisingly broad notion of 'market failure' is then used to justify policy mandates that result in unprecedented levels of government intervention even if such intervention does not amount, it is claimed, to picking winners and losers. Sustainability gains accruing from Europe's expensive and partially contradictory energy policies are rarely measured except along a self-referenced metric turning means into ends and letting the trees hide the forest. In particular, investing between one and two trillion euro to thoroughly redesign a mature electric system that will account for less than 3% of global carbon emissions amounts, as Europeans seem not to want to know, to delaying detrimental climate change by, at most, six months over a half century at a cost of about ten billion dollar per day of delayed warming. While agreeing fully with the objectives pursued, one may argue that this may not be the most efficient use of scarce resources both to save the planet and position Europe in the emerging unforgiving BRIC-centric and U.S.-centric world. The shrinking role of Europe in the global economy and the raging crisis in European integration seem to go unnoticed. Hence the surprising situation of Southern European countries striving to reduce their public deficits and the cost of doing business while increasing public subsidies for energy and the price of energy. The unilateral patchwork of initiatives known as the German *Energiewende* is a corner stone in a puzzle that sees Europe import coal that market-focused Americans are able to do away with thanks to rapid development of much greener gas resources. Europe, we suggest, would gain to decide whether the right hand can go on subsidizing the most detrimental energy source directly (through waivers from carbon pricing and through a poorly designed EU ETS) while the left hand finds no alternative energy source too uncompetitive to be deployed on a massive scale.

Looking forward, the development of large reserves of unconventional gas and tight oil in the U.S. provides opportunities for a market-driven approach to the triple agenda not only in the US – where carbon emissions are reduced in the absence of large scale, European style policies – but globally. As highlighted by the IEA in its November 2012 World Energy Outlook (WEO), the US is on its way to becoming the world's first producer of oil and gas in the mid 2020's and, thanks to fuel efficiency measures, a net exporter of oil around 2030. Beyond reduced physical dependence on foreign sources (but still within the constraints of interdependence), the US is bound to benefit from 'less expensive gas and electricity prices giving industry a competitive edge'². In addition to natural resources endowments in the hands of private as well as public landowners, the US policy model reflects a larger role for market forces. The federal government does step in, however, to encourage innovation as it did through the U.S. Eastern Gas Shales project that greatly contributed to the success of maverick investors like George Mitchell, the father of the shale gas revolution. Reflecting on the new geopolitical situation in which the US (in close synergy with Canada) joins Saudi Arabia, Iraq and Russia as one of the four 'E7' net energy exporters, we discuss what is at stake for the net energy importers of Europe, China and Japan. A U.S. initiative to promote further integration of the market for gas, we argue, could reduce politicization in energy relations, help bring Russia into a genuine global market for natural gas that does not exist yet, and help Europe chart a more cost-efficient and more consistent market-driven green energy transition.

Altogether, a geopolitical perspective and the less complacent cost-benefit analysis it suggests lead to a sharper and more realistic assessment of energy and climate policy options. By and large, Europe seems to be the region putting the more of its destiny at risk – at least as assessed in terms of competitiveness and genuine (as opposed to self-referenced) sustainability. Our overview, merely an introduction to the subject, suggests that this comes from pursuing well intended 'first best' policies that assume a high degree of international convergence in a world which is better understood as a second-best world. The ease with which China, the US and Russia agreed to reject Europe's attempt to bring their airlines into the EU ETS offers food for thought that still has to be candidly interpreted in Brussels. Having successfully sought inspiration from Immanuel Kant's dream of universal peace in the field of European security, Europe should read the writing on the wall and admit that Machiavelli, not Kant, inspires the rest of the world when it comes to energy and, to a large extent, to climate change. Europe's objectives are eminently respectable but a game theory perspective on international energy and climate relations is in order to identify more

2 International Energy Agency, *World Energy Outlook, November 2012* (thereafter WEO 2012), p. 24.

efficient – and more effective – ways of achieving them. A combination of geopolitical and market realism could protect Europe against an idealism that has turned against itself as it now obscures major inconsistencies, massive government intervention and disappointingly small gains. Putting the market back at the centre, eliminating subsidies that hide below the transition rhetoric and learning from strategies that work among other 'E7' players would leave the purists shocked but Europe closer to its objectives of sustainability, security and the almost forgotten competitiveness.

1 INTRODUCTION

The market-centric international energy governance that is not

Before developing the geopolitics-conscious analysis just summarized, it is worth stressing that, in most sectors, economic analysis could proceed without reference to the geopolitical framework. Similarly, policy analysis could be tailored to market realities with the state intervening in a relatively lenient role as regulator and as enforcer of rules and contracts. If energy followed the same logic, the triple agenda studied here would be addressed through policies operating in large part via market instruments or market-supportive regulation. Achieving the three objectives of competitiveness, security and sustainability through the market would require that governments focus on the provision of three 'global public goods': a level playing field covering not just energy trade but also energy investment (energy is the world's most capital intensive industry); a cooperative approach to energy security in which rule-based dispute resolution and market-based diversification would play an essential role to mitigate risk; and the internalisation of the carbon constraint through a price mechanism or through a carbon tax that is economic efficient and that fairly reflects real scarcities by denying any lobby waivers and favours. Unfortunately, the energy world is far from having achieved such market-centric international governance. Geopolitics matter therefore considerably and only political correctness prevents many policies from being labelled as industrial policies or protectionist policies.

The energy world today lives in some hybrid of the state-centric energy system of the 1970s and of the liberalizing world of the 1990s. It could indeed be compared to a hybrid car that runs on its 'market engine' when the road is flat and momentum strong but on its 'state engine' on tougher terrain. The role of government in energy matters has increased significantly over the last decade as a result both of the growing role played by non-OECD states in oil and gas and of efforts by developed countries as well as by China to mitigate climate change through policy mandates that can also, it is hoped, help them develop first-mover advantages in alternative energy sources. Large parts of the primary energy sector have not been brought under World Trade Organization (WTO) rules and most national energy investment regimes are developed with national interest and security considerations prominent. Scope for arbitrage and rule-based conflict resolution are limited and receding. The

many sorts of subsidy regimes in place to develop alternative energy sources are only beginning to be tested at WTO.

This multifaceted role of the state heightens the influence of national energy policies and of geopolitical considerations. While attention usually focuses on power in the hands of producer countries notably through OPEC and the more recent, Qatar based Gas Exporting Countries Forum (GECF), governments of net importing countries also have a major discretionary impact through policies to reduce energy consumption, to scale up renewable energy sources, and in some countries to opt out of nuclear energy. Meanwhile conflicts over energy abound on all three (economic, security and sustainability) dimensions of the agenda. Recent examples include old-fashioned expropriation of oil and gas investors in Argentina, interruption of gas supply by Russia, and the threat of retaliations from China, the US and other that greeted the 2012 decision by the EU to add aviation to its Emissions Trading System (ETS).

In almost no global arena is the contemporary energy agenda being addressed in its three dimensions of security, sustainability, and competitiveness. The term 'almost' is a tribute to the existence of the International Energy Forum (IEF), an effort to bring OPEC, IEA and other countries into biannual exchanges of views. Created in 1991 in the wake of the Gulf War, the forum took twelve years to put in place a permanent Secretariat and another seven years to adopt a Charter at its 2011 Riyadh meeting. Now a genuine international organization, the IEF concerns itself with a broad gamut of issues such as relations between international and national energy companies. Its rule-setting function is still very limited, however, and its valuable role as a global think tank is not yet backed by the resources and track-record that the International Energy Agency (IEA) and OPEC have accumulated over more than three decades.

The absence of a satisfactory, market-centric global energy governance regime is only marginally less pronounced when assessed in the narrower context of each one of the three dimensions of security, sustainability and trade and investment.

Energy security is presently pursued through a patchwork of large consumer oil stockpiles, Saudi investment in spare capacity, Russian brinkmanship in investment and trade in natural gas, environmentally dubious biofuel programs of limited strategic value outside of Brazil, accelerated deployment of domestic renewable energy sources including uncompetitive ones, and recurring investment disputes between international energy companies and host governments. This slightly Hobbesian situation is not inevitable: back in 1994, in a less divisive era, 51 countries

and the EU came together to put in place the Energy Charter Treaty (ECT), a multilateral dispute-settlement instrument which, it was hoped, would depoliticize relations around cross-border investment and transportation of energy. While still promoted by the ECT Organization, this market-centric approach was dealt a near-fatal blow by Russia's decision in 2009 to not become an ECT contracting party and by the earlier decision by the US not to become a signatory. Russian President Medvedev then put forward a draft alternative Charter that would further enhance and legitimize Russia's unilateral rights as a producer country. In fairness, what is summarily labeled 'resource nationalism' is not specific to Russia as all countries entertain a combination of sovereign and market objectives regarding energy³. Energy security, therefore, is achieved through discretionary national policies and through limited cooperation among some producers and among some net-importers⁴.

By contrast, the multilateral policy dialogue related to sustainability is one in which policy and civil society leaders convene far more regularly in highly visible conferences such as the UN Sustainable Development Conferences (UNSDCs) that have been meeting yearly since the 1992 Earth Summit in Rio. Hopes of putting in place a global approach to slowing climate change, however, were dashed at the 2009 Copenhagen 'Climate Summit'; they were kept alive, but barely, through decisions at the Cancun and Durban⁵ conferences to continue negotiating until 2015 under the UN Framework Convention for Climate Change (UNFCCC) and to extend the Kyoto Protocol for a second commitment period starting in 2013. Together with some progress to protect the high seas, a 'non binding commitment' to negotiate by 2015 toward a binding commitment by all parties that would come in effect in 2020 provided the minimum Europe needed to remain committed to Kyoto and to the financial transfer mechanisms it entails, but one needs rosy glasses to call this a success. The June 2012 'Rio + 20' summit was an even sharper anticlimax. The institutional setting and the distribution of power leave little hope that more decisive results can materialize: the search for universal intergovernmental agreements that a few maverick countries can veto at no cost, the rigid and economically obsolete distinction in the Kyoto Protocol between advanced ('Annex 1') and developing countries while the latter have become the major sources of new emissions make this UN process an improbable hub for an effective, rational multilateral approach to

3 See Albert Bressand, 'Foreign Direct Investment in Oil and Gas: Recent Trends and Strategic Drivers', Yearbook on Foreign Investment on International Investment Law and Policies, Karl Sauvant editor, Oxford University Press, 2009.

4 A recent example being the May 2012 decision among the IEA member countries to use their strategic petroleum reserves to mitigate the possible price effect of the planned boycott of Iranian oil.

5 The Durban conference was the 17th session of the Conference of the Parties (COP 17) to the UNFCCC and the 7th session of the Conference of the Parties serving as the meeting of the Parties (CMP 7) to the Kyoto Protocol.

the energy transition. The divisiveness that pervades the process leaves the 'E7' countries free to pursue widely diverging paths; how each country, China notably, sees its own interests as its own emissions begin exacting a price is likely to be the stronger determinant.

Bright spots exist nevertheless as a few specialized organizations promote cooperation on focused aspects of the sustainability agenda, notably the International Partnership for Energy Efficiency Cooperation (IPEEC) and the International Renewable Energy Agency (IRENA) recently set up in Abu Dhabi. Also, at the initiative of U.S. Energy Secretary Steven Chu, many of the 'G20' countries^{6,7} have entered into an increasingly fruitful dialogue on the development of clean energy sources under the framework of the Clean Energy Ministerial (CEM)⁸, still with a limited action-oriented and rule-setting role. Nevertheless, as their reluctance to legitimize 'green growth' policies made clear at the June 2012 'Rio + 20' summit, the 'BRICS' countries are largely free-riders of this multilateral process.

The state of global governance is not much better regarding the third public good needed for market-centric governance, namely the creation of a cooperative, market-centric framework for energy investment and trade. With Canadian oil sands now the major exception, most of the reserves of oil and a significant part of those of natural gas are in the hands of national energy companies. Trade in crude oil and gas has largely been kept outside of the World Trade Organization (WTO) framework⁹. Final demand for hydrocarbon is heavily influenced either through very high taxes (as in Europe¹⁰) or massive subsidies (as in the Middle East and many producing countries). Renewable energy sources are developed on a national basis with strong direct or indirect public subsidies; cooperation is limited to a number of joint technology programs such as the ones in place at the IEA and in the bilateral relations of the U.S. with key partner countries.

6 The G20 brings together finance ministers and central bank governors from 19 countries: Argentina, Australia, Brazil, Canada, China, France, Germany, India, Indonesia, Italy, Japan, the Republic of Korea, Mexico, Russia, Saudi Arabia, South Africa, Turkey, the United Kingdom, the United States of America plus the European Union, which is represented by the President of the European Council and by Head of the European Central Bank. http://www.g20.org/docs/about/about_G20.html

7 24 countries including the European Commission participate in the CEM. G20 countries that do not participate in the CEM are Argentina, Saudi Arabia and Turkey, while the UAE participates in the CEM but not the G20.

8 http://www.cleanenergyministerial.org/news/uk_hosts_cem3.html

9 Melaku Gebeye Desta, 'The Organization of Petroleum Exporting Countries, the World Trade Organization, and Regional Trade Agreements', *Journal of World Trade* 37(3), 2003, p. 529-538.

10 Countries like France even combine high petroleum taxes with partial exemptions that may evolve into permanent subsidies for lower income groups facing 'energy poverty'.

Altogether, the energy system operates under fragmented governance that falls short of providing an integrated, market-centric perspective for energy security, sustainability and fair competition. Hence the importance of the geopolitical perspective to which we now turn (Chapter 2) before focusing on Europe's achievements and challenges (Chapter 3) and on options now in U.S. hands (Chapter 4).

2 THE 'E7' ENERGY COUNTRIES SHAPING ENERGY RELATIONS AND THE ENERGY TRANSITION

Only seven countries or region have the resources and the policy discretion needed to influence the global energy scene and energy transition as a whole. These key players, which include three net exporters and four net-importers, are Saudi Arabia, Iraq, Russia, China, Japan, the European Union and the U.S. India is often mentioned as rivaling China in importance but, as described in the *BP Energy Outlook 2030*, developing along a less energy-intensive road 'India does not follow China's path'¹¹; when reaching China's present per-capita income level by 2030 India is expected to consume only about half the energy that China consumes today. India, in a nutshell, can be regarded as an 'energy global environment taker' rather than 'shaper'. Other countries play a major role through the new production they bring to market—notably Qatar and Australia for natural gas, Canada, Brazil, Angola and Ghana for oil – or through pace-setting initiatives in energy efficiency (Korea) or sustainable cities (UAE). Yet another group of countries such as Mexico, Turkmenistan, Venezuela and Iran command very significant resources – Venezuela's reserves are considered superior to those of Saudi Arabia even if they are one order of magnitude more costly to develop – but these resources are not presently mobilized on a scale commensurate with their potential. Such countries could be viewed as part of a broader 'E20' that needs to be taken into account in a more refined analysis than the one we can present here. But, counting Iraq although it is still on its way to reclaiming such influence, only 'the Energy Seven', hereafter the 'E7', are presently in a position to significantly shape the global playing field for all.

The essential role of the 'E7' countries in energy geopolitics reflects a combination of strong market impact, of significant room for discretionary policy moves, and of capacity for diplomatic leadership. The market impact can reflect an essential role on the supply side (Saudi Arabia, Iraq, Russia but also China for the solar energy value chain), on the demand side (Japan, the EU) or both (the U.S.). Each of the E7 countries is engaged in a sophisticated diplomatic and security game for which it enjoys significant freedom of maneuver and is not overly influenced by one single relationship (as is the case, by contrast, for Canada, a major energy producer still one step away from being a true global player). What sets the 'E7' apart is the role they play *simultaneously* in the provision of the market goods of energy

¹¹ Energy Outlook 2030, BP, 2012, p. 47.

resources(from oil and gas to wind and solar technology) *and* in the provision of partial substitutes for the public goods at the heart of the present inquiry.

CHALLENGER STATES AND STATUS QUO STATES

The starting points in our analysis of each 'E7' country will be whether it is acting as a challenger or as a *status quo* energy power. We shall also assess the extent to which the actual impact differs from such policy ambitions. As we show, Saudi Arabia, China, Japan and the U.S. – as well as Iraq at this early state in its comeback – are five *status quo* countries. In other words, they are satisfied to improve their own fortune within the energy system as it is, even if China has, nevertheless, a transforming impact on the system through the sheer size of her energy demand. The two 'E7' countries that are deliberately challenging the present energy system are Russia, intent as it is to regain its superpower status through the political use of energy relations, and the EU as it aspires to lead an accelerated transition to a low-carbon energy mix. Indeed, Russia and Europe are the only 'E7' members to have articulated a fully-fledged long-term energy strategy – the European Energy Roadmap to 2050 and the Russian Federation's Energy Strategy to 2030¹². To which extent Europe is able to achieve its transformative objectives will be at the center of our analysis in the next chapter. Meanwhile, thanks to the significant increases in its production of natural gas and now of oil as a result of the fracking revolution, the U.S. is the country with the greatest potential to actually reshape the global energy order; and yet, as we discuss our last chapter, it is the one most parochially distracted from such a task.

SAUDI ARABIA AS A STATUS-QUO POWER IN A FAST TRANSFORMING OIL MARKET

The eminent position of Saudi Arabia on the global energy scene is intimately related to the strategic role of oil in the contemporary economy; policy challenges for the Kingdom and implications of its policies for the rest of the world need to be assessed therefore in the context of the broader transformation under way within oil markets themselves and in the global energy mix. Doing so suggests, as we show, that the strategic environment for the Kingdom is transforming fast, in ways that are only imperfectly reflected, so far, in adjustment in the Kingdom's policies.

Saudi Arabia and China are, in a sense, at two opposite ends of the spectrum, the former playing a critical role in balancing the oil market and the latter being the

¹² A Roadmap for moving to a competitive low carbon economy in 2050, [SEC(2011) 287 final, European Commission, March 8, 2011, and Energy strategy of Russia for the period up to 2030, Approved by Decree N° 1715-r of the Government of the Russian Federation, 13 November 2009.

major source of changes on the demand side. Producing about 10 million barrels per day (mb/d), a production that the IEA sees as reaching 13.9mb/d in 2035¹³, Saudi Arabia needs to sell large quantities of oil at a price that is high enough and yet economically sustainable. China, by contrast, is looking to import at the lowest possible price massive quantities of oil expected to reach about 12.3 mb/d by 2035, almost three times current levels, under the IEA 'New Policies' scenario of November 2012¹⁴. Both countries however need well-functioning markets and a lenient geopolitical context. As far as energy governance is concerned, and consistent with their efforts to deepen their interdependence through joint downstream investment, both countries are *status quo* powers.

Saudi Arabia has made significant investments to maintain a spare production capacity of at least 2mb/d that positions it at the centre of the market in periods of tensions. While oil prices are formed in the ICE and NYMEX futures market rather than in OPEC meetings or through an OPEC cartel power that is not¹⁵, Saudi Arabia has the wherewithal to influence price formation when sailing with the wind as happened when it acted to push prices down in the Spring of 2012. A status-quo policy stance, however, assumes that the Kingdom can maintain its eminent role in global oil markets using, basically the same set of policies. Hence the need to assess what is really changing beyond the headline prices for oil that tend to attract most attention.

To describe the transformation underway in the structure of oil market a bit provocatively, one could say that the major source of supply for the recent and foreseeable increase in Chinese and Asian net demand is the sharp decline in OECD oil consumption – to which one can add the development of the US oil production which further reduces US demand for Saudi oil. Of course, flows of oil are globally fungible but it nevertheless matters that oil demand in the US and the EU are expected to fall, respectively, from 17.6 mb/d to 12.6 mb/d and from 11.6 mb/d to 8.7 mb/d between 2011 and 2035 (under the IEA's 'New Policies' scenario as presented in the WEO 2012), offsetting in large part the rise in Chinese oil consumption which is expected to climb from 9mb/d in 2011 to 15.1 mb/d in 2035 under the same scenarios. This reconfiguration of global oil flows is valid under all scenarios canvassed in the WEO 2012. Oil demand by OECD countries is poised to shrink from its 2011 level of 42.1 mb/d to around 40mb/d in 2020 in all scenarios

13 IEA, WEO 2011, p.134.

14 IEA, WEO 2012, p. 85 and 120.

15 Mabro, Robert, 'The International Oil Price regime: Origins, rational and Assessment', The Journal of Energy Literature, Vol. XI, No1, June 2005, pp. 3-20.

and to a range of as little as 26.0 mb/d ('450' scenario) in 2035 to 37.6 mb/d under 'current policies', still well below today's levels¹⁶. One can infer that the major competition facing China in its quest for stable oil supply is not the group of advanced Western countries but other emerging countries (most notably in Asia as Russia and Brazil are major producers) and, very importantly, the oil producers themselves. Oil demand by Middle Eastern producers has already increased by 56 percent over the 2000-2010 decade, four times faster than world demand which grew by 14 percent.

The new geopolitical reality of oil markets is a trilateral relationship between OECD countries reducing their call on global oil supplies, emerging countries needing to fuel their growth internally (Brazil, Russia) or from the global market, and oil producing countries turning into very sizeable oil users, all this at a time when global supplies of liquid are much more constrained. The constrained nature of oil supply is hidden by the rapid development of new classes of more expensive liquid sources – deep-water oil, Natural Gas Liquids (NGLs), unconventional oil and Gas-To-Liquids (GTL) as developed by Shell in its Pearl plant in Qatar. Each of these four additional sources will however meet its own peak in the coming one or two decades; the overwhelming reality remains the peak in the production of conventional oil¹⁷ at 67mb/d that was reached around the year 2005¹⁸. Incidentally, the peak oil in conventional oil greatly increases the value of the fifty years or so of proven oil reserves in the ground of Saudi Arabia: with the price benchmark now a combination of deep water oil, oil sand and tight oil, the level of economic rent locked into Saudi subsoil has experienced a step change. Subsidized consumption of oil products is a key parameter in this new competition, especially for oil producing states. As observed by BP, high oil prices have led (mostly net oil importers) to reassess the viability of subsidies and 'only' 20 percent of oil consumption in 2011 was in countries with subsidies, down from nearly 40% in 2008¹⁹.

Saudi Arabia may not have developed the full set of policies it will need to maintain its central role in these structurally transformed markets. In a sense, Saudi Arabia is a mirror image of the U.S.: the latter, as we shall see when discussing possible exports

16 WEO 2012 p. 83.

17 Conventional oil is defined here as oil with less than 15 degrees API, produced on shore or offshore from waters not deeper than 400m (after which structures can no longer be grounded in sea floor).

18 Presentation by Adam Seminsky, Energy Information Agency, at the Oil Markets in the 2010s-2020s conference, June 19, 2012. See also WEO 2012 p. 81: 'Oil production, net of processing gains, is projected to rise from 84 mb/d in 2011 to 97 mb/d in 2035, the increase coming entirely from natural gas liquids and unconventional sources.' For the various types of oil, see WEO 2012 pp. 99-100, noting however that the WEO in these tables does not distinguish between on shore and deep water oil, which we do here to highlight price implications.

19 BP Statistical Review of World Energy, June 2012, p. 4. www.bp.com/statisticalreview

of natural gas, is becoming a major producer but is still used to protecting its interests as a net importer; similarly Saudi Arabia is a major energy consumer but still designs policies based exclusively on its role as producer –mostly of oil, and someday of solar energy. Even if obscured by some controversy between BP and the IEA regarding recent growth in Saudi demand, an unambiguous warning sign is that Saudi Arabia ranked behind China but ahead of India as the second largest source of additional oil demand in the 2000-2010 decade, this with a population of less than thirty million as opposed to the one-billion-plus population of India and China²⁰. Power demand and desalination needs are presently growing at 7 to 8 percent per annum; according to government figures power demand expected to triple to 121,000 megawatts by 2032. In the view of Citigroup, Saudi Arabia faces a significant risk of turning into a net oil importer as early as the 2030s, if it continues subsidizing energy and water consumption on the present scale²¹. Similarly, according to Hashim Yamani, President of the King Abdallah City for Atomic and Renewable Energy, KSA will require 8mb/d by 2028 just to meet its domestic needs²². The Kingdom is already embarked on a major drive to develop solar energy production but it still has to articulate a far-sighted policy on energy-efficiency that could significantly limit the extent to which its domestic consumption is cutting into its long-term export potential. Doing so would possibly remove one of the levers that the Saudi monarchy has used to maintain political stability in the face of rapidly growing population; but, unlike largely wasted subsidies, a far-reaching energy efficiency policy could foster the emergence of a competitive, diversified Saudi economy less dependent on oil, probably a greater source of genuine political stability over the long term.

In spite of having opened the aptly named Empty Quarter to international investment in gas and of having successfully developed its first non-associated gas field (the Karan field, which could displace 200 kb/d of oil at full capacity²³), the Kingdom has been slow in developing its gas resources. This exacts a cost since oil must be used for power generation, generating only a fraction of the value it would fetch if exported. To minimize the adverse environmental impact of burning oil, Arabian Light crude is being used, which compounds the economic loss. Importing natural gas to substitute for Saudi oil in power generation would offer a textbook example of the benefits that can accrue from maximizing the scope for a country's comparative

20 The additional oil demand over the 2000-2010 decade was of 4.2 mb/d in China (1.3 million inhabitant), 1.2 mb/d in Saudi Arabia (for a population of 20 million in 2000 and 27 million in 2010) and 1.06 mb/d for India (1.2 billion inhabitant).

21 <http://www.bloomberg.com/news/2012-09-04/saudi-arabia-may-become-oil-importer-by-2030-citigroup-says-1-.html>

22 'Saudis focus on nuclear, solar energy', UPI, March. 24, 2011, at http://www.upi.com/Business_News/Energy-Resources/2011/03/24/Saudis-focus-on-nuclear-solar-energy/UPI-21861300993463/#ixzz2CNZdGBGf

23 WEO 2012 p. 86.

advantages yet, in line with the limited integration of the energy sector among countries of the Gulf Cooperation Council (GCC), the Kingdom refrains from importing gas. More generally, the benefits of a fully market driven approach to the pricing and trading of hydrocarbons are still imperfectly realized, as can also be seen of petrochemical projects for which political pricing of feedstock fuels still tilts the playing field in favor of Saudi state-owned companies against domestic and international investors. A one hundred billion dollar plan to build 41 Gigawatts (GW) solar power capacity under development is intended to satisfy a third of its electricity needs by 2032²⁴, yet the Kingdom is one of the few G20 countries not taking part in the Clean Energy Ministerial and one of the most steadfast opponents to a global climate deal.

Altogether, the challenge for the Kingdom is to take the full measure of transformations in the global energy system that are making it more diverse, electricity-centric, carbon-informed and transformed from the demand side as much as from the supply-mix one.

FALSE STARTS, ETHNIC CONFLICTS AND MASSIVE RESERVES: IRAQ AS THE NEXT SWING PRODUCER

Iraq is poised to become the country on which the long term balance in oil markets will most crucially depend when world economic growth firms again. Indeed, the 'call on OPEC' will be up to the task only if Iraq is able to deliver on a majority of its very ambitious oil development and gas recovery projects. Doing so will require satisfactory execution of the Technical Service Agreements entered into with half a dozen joint ventures of Western and Asian international oil companies (IOCs). These agreements – in which IOCs act as service contractors and are paid a very low fixed fee per barrel on top of their costs – are so far on track technically. Yet administrative and political delays remain a constant threat, compounding infrastructure shortcomings and bottlenecks associated with running many large-scale projects simultaneously.

Three years into a very ambitious expansion program, the initial target of a 12 mb/d oil production by 2017 – which most industry sources saw as two times too ambitious – has given way to more realistic while still very ambitious assessments. In its WEO 2012, the IEA develops one central scenario in which production raises to 8.3mb/d in 2035 as well as 'delayed' and 'high production' scenarios in which it reaches, respectively, 5.3mb/d and 10.5 mb/d. Interestingly, a large share of 2035 production

24 <http://thinkprogress.org/climate/2012/05/11/482660/saudi-arabia-unveils-100-billion-plan-to-make-solar-a-driver-for-domestic-energy-for-years-to-come/?mobile=nc>

is seen as coming from the South Iraq Shi'ite region (6.4mb/d out of the 8.3mb/d total), of which 5.6mb/d from the largest four fields²⁵. Export capacity in 2035 ranges from 3.8 mb/d in the 'delayed scenario' to 7.9 mb/d in the 'high production one' (with the central scenario showing exports of 4.4 mb/d in 2020 and of 6.3 mb/d in 2035²⁶). The ramp-up in oil production is only one aspect of a broader development of Iraq that could further strengthen the geopolitical and economic position of the country in the next decades. Production of non-associated natural gas develops briskly in the IEA central scenario in the 2020s, to reach nearly 40 bcm in 2035. Power generation capacity zooms from today's 16GW to 60 GW by 2020 and 83 GW by 2035. Much of the new capacity is gas fired, with Iraq nevertheless able to export nearly 20bcm of natural gas in 2035²⁷. Investment in the energy sector amounts to a little over half a trillion dollar over the period.

In none of these IEA scenarios does Iraq overcome Saudi Arabia although such a prospect has been contemplated in Iraqi circles and could also happen from unchecked rises in Saudi domestic oil demand. Some form of accommodation between the two OPEC-founder countries will be necessary regarding, notably, when and how Iraq will be subjected to the OPEC quota system. Indeed, the 'high production' scenario of the IEA – in which Iraq would contribute three fourth of the growth in global supply by 2020 – includes assumptions about significant reduction in other OPEC members' production levels. Altogether, how Iraqi oil production develops and how Iraq's relations with Saudi Arabia and OPEC develop will have major implications for oil prices: should for instance Iraqi production develop along the 'delayed' rather than 'central' scenario, a very significant 10% increase in global oil prices would follow.

Which scenario will materialize, within or even outside of the WEO 2012 range, will depend to a very large extent on whether Iraq can resolve the political tensions between the central government in Bagdad and the three autonomous Iraqi regions that kept Iraq's energy policy in a quagmire until the two oil auction rounds of 2009. Tensions remain high notably between Bagdad and the semi-independent Kurdish Autonomous Region (KAR). The KAR is embarking into pipeline diplomacy of its own to circumvent its dependence on Bagdad-controlled export routes. More importantly, the KAR has entered into forty Production Sharing Agreements (PSAs) to develop oil and gas that Bagdad considers as void. Initially these PSAs were with little known companies of central Europe and Norway but Gazprom, Total, Chevron and, most

25 WEO 2012, p. 429.

26 WEO 2012, p. 484.

27 WEO 2012 p. 456 and 477.

spectacularly, ExxonMobil have now crossed the Rubicon and entered with the KAR into deals that they know to be opposed in Bagdad. After being excluded from future Iraqi auctions for Technical Services Agreement, ExxonMobil briefly froze its Kurdish project before opting to forego future development in Southern Iraq, at least in the present context, and give priority to exploration projects in the KAR. Not to be hostage to the central Iraqi government, ExxonMobil is in the process of divesting from its stake in the 'super-giant' West Qurna-1 oilfield in Southern Iraq, hoping to be done by end of 2012. The company may also be replaced in its – potentially more profitable – role as the operator of a syndicate providing all Southern Iraq joint ventures with the massive amounts (3 mb/d) of processed sea water needed for injection in key oil fields.²⁸

CHINA: A STATUS QUO ENERGY POWER THAT CHANGES THE GAME

China has a major impact on the global energy balance. Together with India, China accounts for all of the expected increase in coal consumption in the WEO 2012 main scenario; China accounted for about half in the recent increase in oil demand, a trend that will continue as the Chinese car fleet is expected to reach 430 million vehicles in 2035, against 50 million in 2010 (car ownership in China is presently at about 50 cars per 1,000 households against 900 cars in the US). As a result, China is using a quite remarkable share of the planet's remaining 'carbon sink' capacities compatible with a temperature increase of only 2 degree Celsius. The fact that China has been the world's largest emitter of greenhouse gas since 2009 and that the average Chinese citizen is responsible for about as much emission per head (7.2 tons of carbon in 2011) as the average European (7.5 tons)²⁹ is in no way reflected in the present state of energy-and-climate governance. China seems perfectly able to further delay the day of reckoning.

More generally, policy-wise, however, China is a *status quo* power governed by opportunistic national considerations rather than by any clear view of long term, systemic challenges that will transform the global energy and climate system. The largest recipient of Clean Development Mechanism funds and a staunch defender of the UN 'common but differentiated responsibilities' principle (based on criteria for differentiation that no longer reflect economic and financial realities), China is still a free rider as far as the sustainability of the global energy system is concerned. While the Chinese 12th Five-year Plan endorses objectives of energy and carbon efficiency,

28 Iraq Business News, October 19, 2012 <http://www.iraq-businessnews.com/tag/water-injection/>

29 Source: BL Netherlands Environmental Assessment Agency and the European Commission's Joint Research Centre (JRC).

it stays clear of endorsing any constraint on absolute emission levels. The same is true of energy security.

Often described as pursuing an energy-security policy through political deals with countries like Sudan or Iran, China was left in fact with little choice at first but to go for partners that Western majors had neglected or antagonized. Things are changing in relation notably to a new wave of producers in Africa: the latter are attracted to Chinese aid packages that combine infrastructure programs, financial loans and resource development³⁰ in a manner that Western donors are prevented from imitating due to their more segmented policies and more constraining competition and conduct-of-business rules. China is now passed this early phase, with CNPC investing on the side of BP in Iraq and PetroChina on the side of Shell in Australia; the global presence of the three major Chinese oil companies is global and the same is true of Chinese national champions in alternative energy. Interestingly, the shale-gas and tight-oil revolution in North America puts Chinese companies at the forefront of efforts by foreigners to acquire energy assets in that part of the world, giving the US some unexpected if limited leverage on Chinese moves. The \$15 billion acquisition by CNOOC of Nexen in Canada (cleared on December 7, 2012) will give China assets in the Gulf of Mexico, the North Sea, Africa and the Middle East as well as in Canadian oil sands. The British holdings of Nexen will give China a window on, and a voice in Brent crude pricing³¹. The \$1.5 billion investment of August 2012 in Cheniere Energy's liquefaction and LNG export facility at Sabin Pass is another vivid illustration that China is now building positions at the centre, and no longer merely at the periphery, of the world energy system. Yet at the end of the day, China – a net importer of oil only since 1993 – depends on well-functioning international markets. Its own blue sea navy and a 'string of pearls' of naval bases are gradually being built, but the U.S. is still the *de facto* guarantor of China's seaborne energy supply.

An important geopolitical consideration will be the extent to which China is able to meet some of its growing needs through untapped domestic sources, notably coal from Northern China and shale gas. Success in developing the latter could result in a glut of liquefied natural gas (LNG) after many projects (notably in Australia) geared to supplying the Chinese market come on line. The development of large Chinese shale gas resources, however, is held up by serious challenges in matters of water,

30 'As highlighted by the [...] Democratic Republic of Congo and Angola deals, the border between private and public firms and government and private sponsored projects is very blurred when it comes to China', Bas Percival, Benjamin Valk and Lucia van Geuns, 'Gambling in Sub-Saharan Africa: energy Security through the Prism of Sino-African Relations, Clingendael International Energy Programme, July 2009.

31 Twin Takeovers To Give China significant UK North Sea Oil Output, <http://www.adfn.com/nyse/StockNews.asp?stocknews=NXY&article=53562000>

transportation and the environment as well as by the uncertainty still clouding the economic prospects for shale gas outside of the US³².

JAPAN AND THE INEFFICIENT SUPPLY OF AN EFFICIENT DEMAND

Japan is a world leader in energy efficiency, a position further strengthened by the temporary disappearance of the fourth of the Japanese electric supply in the wake of the Fukushima accident – a challenge which Japan faced quite remarkably through energy savings without enduring any power blackout. Japan is less successful however at setting up and operating efficient energy markets and structures. The Fukushima disaster is largely a reflection of a failed oversight of power generation companies like Tepco by regulators who often come from the same companies and are not providing the truly independent vetting needed. This in turn creates strong popular opposition to policies perceived as self-serving and short sighted on the part of policy makers and companies alike. Japanese nuclear plants were built in coastal regions known for centuries for being exposed to major tsunami risks, which did not prevent some power plants from being built in artificially lowered grounds to save on sea-water pumping costs – a truly remarkable short-sightedness. In a number of plants, emergency generators had been installed with no additional defense against tsunami than the wall protecting the plant itself – a disregard of basic principles of risk mitigation even less excusable in regions in which coastal sea dwellers of the 20th and 19th century had left memorial stones with dire warnings about past tsunami disasters and calls to never build again in these exposed zones. Once the tsunami wave broke, TEPCO plant operators and supervisors shied from placing safety unambiguously over any other consideration. Disregarding all international advice during the critical first hours and days, they courted risk in a futile effort to protect the economic survivability of the plant, letting the accident assume major, avoidable proportions. In its report, the independent investigative commission created by the Japanese Diet pointed to 'fundamental causes' of the disaster that were all grounded in Japanese corporate and regulatory culture, not nuclear technology. In his forewords, the chairman assails no less than 'the ingrained conventions of Japanese culture: our reflexive obedience; our reluctance to question authority; our devotion to 'sticking with the program'; our groupism; and our insularity.'³³

32 On shale gas, see Maximilian Kuhn and Frank Umbach, *Unconventional gas: a game changer with implications for Europe*, European Center for Energy and resource Security (EUCERS), King's College London, May 2011.

33 Report by the independent investigative commission established by the Japanese Diet July 5, 2012, as quoted in Toshihiro Higuchi 'Japan's culture: Culprit of the nuclear accident?', *Bulletin of Atomic Scientists*, September 4, 2012.

An encouraging sign that Japan is striving to break away from such a dysfunctional set of habits was the winding down of the Nuclear Security Commission (NSC) and Nuclear and Industrial Security Agency (NISA) and the creation of a more independent Nuclear Regulatory Authority (NRA) under the Ministry of Environment. Whether this is enough to overcome the 'nuclear village' mentality remains to be seen.

Restarting its 48 closed nuclear plants (out of 50) only gradually, having announced in September 2012 a complete (but still to be confirmed by future governments) exit from nuclear power by 2040, Japan will be forced to seek alternative supplies of energy, notably of LNG. This is opening major opportunities for Australian, Qatari Canadian and potential US exporters. By exposing Japanese organization in the field of natural gas, such moves are now calling attention to a set of cultural and market practices in that part of the energy system. The critical question in this case is not one of safety but one of costs.

How Japan manages her growing LNG imports is not yet an unambiguous model of efficiency. Japan has been for a long time a major importer of LNG and yet has failed to develop a pipeline infrastructure that would support an integrated domestic gas market; LNG shipments that need to be moved from one power company to another are not sold and purchased on a market but traded on the basis of an administrative tariff that reinforces a highly dysfunctional natural gas oligopoly in a geographically fragmented domestic market. Japanese re-gasification plants and Japanese LNG purchase contracts are often referred to in the energy industry as 'gold plated', meaning that cost discipline is softened by the knowledge that all costs will just be passed on to final customer in the absence of almost any competition among providers. No one seems surprised that natural gas is sold to Japanese users at a premium of around fifty percent compared to prices the same cargo would fetch in Europe, not to mention at a premium of several hundred percent compared to Henry Hub priced gas in the US – a resource presently not available on the international market in significant quantities. The President of Tokyo Gas and the Japanese Trade Minister are now on records for advocating 'convergence with international standards by introducing the link to U.S. Henry Hub and European gas prices'³⁴. Yet, even in such statements, the most pressing concern seems to be the risk that high prices could lead to a shrinking of the share of natural gas in the energy mix – a

34 Tsuyoshi Okamoto, President, Tokyo Gas Co, speaking at LNG conference, Sept 2012. Minister Yukio Odano observed in an even more incremental manner that "With the paradigm shift due to full-fledged production of shale gas, oil-linked indexing is starting to be less reasonable" – leaving open the prospect that, should market structure continue to evolve, 'it will no longer be reasonable'. Quoted in 'Asia's energy-hungry nations may be finally making headway in their push to scrap oil-linked natural-gas prices', Reuters, <http://uk.reuters.com/article/2012/09/21/asia-lng-comments-idUKL4E8KK37Y20120921>

departure from the status quo, so to speak, rather than a concern with the cost of gas as such. In any case, it will be interesting to see how long it takes Japan, motivated as she can be to lower her gas import bill, to fully embrace the Henry Hub price reference and the change in business practice and culture it would entail. After a wave of consolidation culminating in 2008, the largest international oil and gas energy company in Japan is Inpex Corporation. Active in 26 countries, notably in Australia where it develops, with Total SA of France, the \$32 billion Ichthys LNG project, Inpex is still, in its own words, merely 'a midtier oil and gas E&EP company'³⁵. Japanese trading houses (*sogo sochas*), notably Mitsubishi and Mitsui, also play a role in providing Japan with access to 'equity oil and gas'. Whether Japan is properly organized and prepared for the next phase of energy geopolitics and energy transition will be an important question to follow in the years to come.

THE RUSSIAN STATIST ENERGY SUPERPOWER

The world's largest producer of oil, the holder of one fifth of the world's gas reserves and a close second to the U.S. for natural gas production, Russia is the 'E7' challenger state by excellence. The cultural underpinning for the Russian unease with market-based relations over energy was provided by Deputy Prime Minister Igor Setchin when he told the Wall Street Journal's international readership that '*Russian resources are a God-given that should be used effectively... Somebody is always wanting to take them away.*'³⁶ What is meant by using resources 'effectively', and how to better integrate Russia into the global energy system, therefore become key questions from an international – most notably a European – energy security standpoint.

Like Europe, Russia has articulated an explicit long-term energy strategy, which it regularly updates³⁷; unlike Europe's enlightened emphasis on planetary challenges, Russia places its own needs squarely at the centre, including needs born from its frustration with the present world order. While strongly affirming the need for Russia to progressively reduce dependence on natural resources and promote a diversified economy, the 'Russian Energy Strategy up to 2030' endorses the use of natural resources in support of Russia's ambitions to become a superpower again. Yet a lesson from the failure of the USSR was that such ambitions will not be realized as long as Russia does not catch up with advanced market economies in the West and, increasingly, in Asia. A strategy based on maximization of natural resources rent and on politicization of energy relations is not necessarily the most efficient way to do so, especially in a more diverse energy system open to changes from many sides. In

35 <http://www.inpex.co.jp/english/business/index.html>

36 Global Interview of Deputy Prime Minister Igor Setchin, The Wall Street Journal, March 31, 2009, p. 3.

37 Energy strategy of Russia, op. cit.

addition, such a resource-dependent strategy may not achieve as much as hoped in sheer power terms: there are not so many Belarus', Armenia's and Ukraine's on which to exercise the raw force of energy dependence and one would be at pain mentioning one major conflict or one governance issue of global significance that turned out differently out of deference for Russia's energy might. Within the energy realm itself, OPEC oil exporters can be heard asking Russia to renounce its observer status – the concern being that Russia used insights gained on OPEC strategy to maximize her own revenue at the expense of the organization³⁸. Similarly, in natural gas, Russia's threat to take her gas to China rather than to Europe has led to a series of glorious Chino-Russian summit *communiqués* that still have to be translated into commercial deals. China instead used opportunities created by the Russian multi-tier gas price system to offer Turkmenistan a deal Russia was slow to see coming; in a surprisingly short time China went on to build a pipeline across three central Asian states bypassing Russia. China is actually in a position to give up on Russian gas, except if Russia were to bite the bullet and price its natural gas in relation to coal, China's core energy source, rather than to oil, the much more favorable reference Russia is able to preserve in its relations with Europe. The rapid Arctic icecap melt may open new maritime routes for LNG trade – as illustrated on December 6, 2012 when the Gazprom operated tanker Ob River delivered Norwegian LNG to Japan through the Northern Sea Route – but long term commercial relations require more than physical routes.

More subtly, the 'Russian Energy Strategy up to 2030' can be conducted only through the state – or through national companies under tight state control – which creates invisible barriers to the development of a powerful, diversified Russian economy. Rather than decreasing, this state-centric approach continues to increase, witness President Putin's decision in May 2012 to remove energy companies from the list of candidates for partial privatization. The fact that BP had little choice but to sell its highly profitable 50 percent share in TNK-BP to the State controlled company Rosneft – which will also acquire the other half in the hands of the AAR group of oligarchs, apparently for 2 billion dollar more than the BP share – is also a sure sign that the state is the one and only player when it comes to major energy projects in Russia.³⁹

While command-and-control has its advantages, there is a cost in strengthening the role of state-owned companies, in re-imposing Soviet-era controls over domestic

38 see 'Russia and the Caspian States in the Global Energy Balance' Baker Institute, Report 39, May 2009.

39 On Rosneft and the role of the Russian state see Thane Gustafson, *The Wheel of Fortune: The Battle for Oil and Power in Russia*, Harvard University Press, 2012.

energy infrastructures and in promoting projects that are very costly and yet cloaked in legal, fiscal and political uncertainties, like the still pending Shtokman gas project or the costly South Stream subsea pipeline. In Western Europe, Russia damaged its hard-won image of reliable gas provider through two bizarre episodes of gas transit interruptions. In Central Asia, Moscow made itself unpopular in the April 2009 'accidental' blow up of the branch of the CAC-4 pipeline through which it had committed to import more Turkmen gas (to be paid at the higher European prices with adjustment for transportation costs) than it could afford after the 2008 recession had set in. Over the long run, turning off the tap or drawing gas in a way that results in a pipeline's explosion distract from, rather than reinforce superpower aspirations.

The September 2012 decision by the EU Competition Directorate to open an antitrust probe into Gazprom reflects growing unease with long standing Russian policies of selling the same commodity at different prices in different markets based on the degree of political alignment and/or on ease of commercial integration. By issuing a decree prohibiting 'strategically important companies' from cooperating with foreign investigators, President Putin made clear that dealing with Gazprom is akin to dealing with the Russian state and that Gazprom will not answer foreign regulators' queries except if with the approval of Russian authorities⁴⁰. While strengthening Gazprom's hand in the short term this is, quite probably, weakening its position as the normal, competitive and trustworthy company it aspires to be. Whether the South Stream project to carry gas into Southern Europe really extends Russia's strategic reach or whether it illustrates a retrenchment on sub-regional markets at a time of market integration when attention should focus on LNG trade and shale resources development is a question worthy of being asked⁴¹.

ENERGY INSECURITY ASSOCIATED WITH EURASIAN GAS

As we review now, the explicit use of energy as a tool for assertive diplomacy leads Russia to pursue two medium term objectives – the first being the recreation of the integrated pipeline system lost in the hasty dissolution of the USSR, and the second limiting Europe's alternative routes of access to natural gas – as well as one longer term objective in the form of the gradual development of an influential Gas Exporting Countries Forum (GECF). The three approaches combine to create a nexus of energy insecurity centered on Eurasian gas. Such insecurity develops at an awkward moment

40 <http://www.nytimes.com/2012/09/12/world/europe/russia-impedes-inquiry-of-fuel-supplier-gazprom.html>

41 Such is the view put forward by EER editor Matthew Hulbert in 'Why South Stream is the beginning of the end of Gazprom's dominance: A Tale of Two Gazproms', *European Energy review*, November 30, 2012, at www.europeanenergyreview.eu/index.php?id=3994

as Europe, as we discuss below, is hesitant on what role gas should play beyond 2030 in its renewables-centric policy.

Toward its first objective, Russia invests significant financial and diplomatic resources to recreate the integrated pipeline system that the Soviet Union had put in place. Agreements with Belarus, Armenia, and Serbia illustrate this approach. Negotiated from a position of strength, such agreements typically involve forgiveness of the debt incurred by the partner country in buying Russian gas in exchange for the transfer to Russian entities of controlling rights over that country's pipeline system. At a time when expanding trade in LNG assumes growing strategic importance, this defensive game over pipeline gas may be absorbing more resources than warranted. In any case, such agreements may fail to give Russia the stable framework under which to pursue its interests: few countries are made into lasting allies through unequal treaties entered into under the threat of bankruptcy or energy flow interruptions; based on short term incentives, such treaties may well offer only thin foundations for long-term cooperation. Indeed, in spite of the one-sided Kharkiv Accord of April 2010 (whereby Ukraine refrains from exercising its sovereignty over the Sebastopol naval base in Crimea in exchange for a rent Russia pays by lowering by 30 percent the price of the gas it sells to Ukraine), Russia is still far from having turned a pro-Russian Ukrainian regime into a dependable ally. The more so as Russia is investing close to thirty billion dollars to build subsea pipelines to bypass Ukraine from the North (Nord Stream 1 and 2, and possibly Nord Stream 3 and 4) and the South. Bypassing Ukraine, as the South Stream pipeline proposes to do for a euro 15.5 billion price tag⁴² without bringing new gas into the system, is a costly way to designing a set of well-thought out commercial contracts: if efficient use of resources were of interest, Russia could learn from Morocco and Algeria, two countries at least as much at odds with one another as Russia and Ukraine that nevertheless entered into two parallel contracts with European buyers to channel Algerian gas to Spain through Morocco in ways that have been resilient to political tensions.

The second dimension in Russian foreign energy policy – preventing Europe from accessing alternative Eurasian gas sources through routes not controlled by Russia – applies most visibly to the Caspian region. Here too, a balanced perspective is in order: Russia resented the cold-war discourse that surrounded the construction of the Baku-Tbilisi-Ceyhan oil pipeline and of the Baku-Tbilisi-Erzurum gas pipeline to provide Azerbaijan with export routes to Europe bypassing Russia⁴³. While commercially neutral or negative, the Blue Stream pipeline across the Black Sea

42 <http://gazprom.com/about/production/projects/pipelines/south-stream/> retrieved on December 4, 2012.

43 See Steve LeVine, *The Oil and the Glory: The Pursuit of Empire and Fortune on the Caspian Sea*, Random House, 2007.

enabled Russia to keep Turkey reliant on its gas, a fact best analyzed in terms of game theory rather than mere accounting⁴⁴. For a decade now Russia has been entering into Memorandums of Understanding with almost all of Europe's gas providers around the Mediterranean and even in Nigeria. MOUs have been regular discussions signed with Egypt, Iran, Kazakhstan, Kyrgyzstan, Libya, Nigeria, Qatar and Uzbekistan. Meanwhile, Russia has engaged competitor Qatar into cooperation and has celebrated the 'gas troika' of Russia, Qatar and Iran. While concrete implications have been quite limited, Russia is exposing herself fairly straightforwardly to the risk of being seen as trying to limit Europe's access to non-Russian controlled gas resources. Efforts by Gazprom to acquire a 10% stake the proposed \$10 billion 30bcm Trans-Sahara pipeline to carry Nigerian gas through Niger and Algeria led the EU Commissioner to fly urgently to Abuja with counter proposals⁴⁵. If Europe were to assess its dependence on Russian gas by counting gas from countries in which Russia has acquired strategic interests in pipelines or entered into strategic agreements, the dependency ratio would be at a worrisome 50 percent level. Gazprom also finds itself having to live with the Russian political discourse which can be very dismissive of European competition rules, this while playing its cards as an equity investor in intra-European storage and distribution facilities – including existing interests at Baumgarten where the proposed Nabucco pipeline (aiming at diversifying routes from Russia) would reach Europe. While they are now preparing to adopt international accounting standards, some companies playing a role in the Russian strategy such as Russia's fourth oil producer Surguneftegas – a company whose CEO was thanked by President Putin 'for funding a Pacific nuclear submarine base in 2002 when the state couldn't fund it' – have been considered until now as particularly opaque even by Russian standards⁴⁶.

The longer-term element in the Russian effort to turn energy resources into geopolitical clout is through the Gas Exporting Countries Forum (GECF)⁴⁷. Like that of OPEC back in 1960, the creation of the GECF in Tehran in 2001 went largely unnoticed. The fragmentation of the global gas market, the role of Qatar – a state home to the U.S. Seventh Fleet – and the potential legal and commercial costs that exporters would incur for renegeing on long-term gas supply agreements were

44 For a comprehensive analysis of Russian midstream options and of how Russia has, or could, play its hands in a real-option game theoretic perspective, see Smeenk, Tom, *Russian Gas for Europe: Creating Access and Choice and Boon von Ochssée, Timothy, The Dynamics of Gas Supply Coordination in a New World*, Clingendael Energy Publications, 2010. See also *A New EU Gas Security of Supply Architecture?*, de Jong, Jacques.

45 Gazprom eyes Saharan pipe plans, <http://www.upstreamonline.com/live/article152530.ece>; 'Total, Gazprom eye Sahara gas pipeline venture', Reuters, Abuja, February 2009.

46 <http://www.bloomberg.com/news/2012-03-02/surgut-cited-as-best-russia-oil-with-28-billion-secret-energy.html> and <http://www.businessweek.com/news/2012-02-22/putin-thanks-oil-billionaires-for-rescuing-nuclear-sub-base.html>

47 The twelve GECF members are Algeria, Bolivia, Egypt, Equatorial Guinea, Iran, Libya, Nigeria, Oman, Qatar, Russia, Trinidad & Tobago, and Venezuela. The three countries with observer status are Kazakhstan, Norway and the Netherlands.

deemed to make the creation of a gas cartel unfeasible. Indeed, while Iran had proposed the creation of an OPEC-like gas cartel, the GEFC charter adopted in Moscow in 2008 makes reference to mutuality of interest, transparency and dialogue with importing countries. Nevertheless, the move away from market-friendly governance was illustrated by the remarks by Russian Energy Minister Sergey Shmatko at the December 2009 GEFC meeting in Doha: '*Today we can speak about gas OPEC as a fully fledged international organization*'. Minister Shmatko also rejoiced that '*by a unanimous decision a Russian national was elected its secretary general. This is to show that member countries expect Russia to use its political weight to promote [GEFC] interests*'.⁴⁸ The cooperation among gas exporters suggested by Russia sounds innocuously limited to exchange of information on contract clauses and on investment plans. Coordination on contract clauses, however, can only help strengthen the indexation of natural gas prices on oil prices which costs Europe about 7 billion dollar in 2011⁴⁹. Coordination of long-term investments by GEFC countries could limit future supplies of natural gas and drive prices artificially high. Hopes to create an OPEC-like Organization of Gas Exporting Countries (OGEC) may rise again after the election of Iran's Energy Minister Rostam Qassem as chairman of the GEFC at the organization 14th ministerial meeting in Equatorial Guinea in November 2012.

Ideally, Europe's growing dependence on Russian gas could be managed like other trade dependencies through a high-level agreement to adopt a set of market-driven principles such as those that an enhanced Energy Charter Treaty could embody. All such efforts have floundered. In the early 2000s, in fairness to Russia, this failure reflected the lack of a genuine offer of partnership by Europe and the U.S. to Russia. The widely discussed 'partnership' that the EU –like NATO – was inviting Russia to join remained a relatively abstract idea with little political momentum. Since then, and with the U.S. 'reset' of relations with Russia still mysterious, progress is blocked by what Moscow Carnegie Endowment's Dmitri Trenin calls Russia's suspicion of 'Europe's normative imperialism'⁵⁰. Legal principles based on Europe's market liberalization doctrine and experience are perceived in Moscow as a Trojan horse for a broader submission to foreign legal norms: such is the case for Third Party Access rules for pipelines that would enable Russian independent producers to export large quantities of gas they now must flare without any benefit for the Russian economy

48 'Shmatko predicts strong role of GEFC'. RT. 2009-12-11. <http://rt.com/Business/2009-12-11/shmatko-gefc-opec-gas.html>. Retrieved 2009-12-12.

49 Approximate computation based on Platts European Gas Daily: monthly averages, January 2011, p.2. See also Jonathan Stern and Howard Rogers 'The Transition to Hub-Based Gas Pricing in Continental Europe', Oxford Institute for Energy Studies, NG 49, March 2011.

50 Dmitri Trenin, Deputy Director, Carnegie Moscow Center, 'Toward A New Euro-Atlantic 'Hard' Security Agenda: Prospects for Trilateral U.S.-EU-Russia Cooperation', p. 3.

for lack of an outlet. In all fairness, this principle is honored by the EU itself in the exception, as waivers are systematically asked for and granted for large scale new projects. Meanwhile, the EU followed a self-centric view of energy relations when designing its Third Package of Gas Market Directives under the assumption that similar legal principles would extend throughout Eurasia. As such convergence failed to materialize, Europe had to improvise to avoid that vertically integrated companies from non-European states reap disproportionate benefits at the expense of tightly constrained European companies. Understandably, the so called 'Gazprom clause' subjecting to national government vetting acquisitions of European energy assets by vertically integrated companies was seen by Russia as discriminatory, which it is, although the reason for the discrimination can be debated.

THE NEED FOR ENERGY LEADERSHIP

Altogether, compounding the failure of multilateral energy governance, the triple challenge of energy security, sustainability and economic level playing field is not being met at the global level; vulnerabilities develop along all three dimensions. Economically, while a keen observer like Edward Morse is right to observe that *'the concept of peak oil is being buried in North Dakota, which is leading the U.S. to be the fastest growing oil producer in the world'*⁵¹, oil prices are still influenced by unpredictable geopolitical events as much as by supply, demand and investment levels. Natural gas importers in Europe and the Pacific suffer from high prices for natural gas as a result of oil-indexation clauses, even if the latter may be tempered with some references to spot prices in softer markets. The increasingly politicized conditions for access to upstream resources, the fragmentation of the natural gas market, the industrial policies that develop in the name of 'green energy', these and other large distortions suggest that little progress is taking place towards a level playing field in energy investment and trade. Meanwhile, according to the IEA, progress towards a sustainable energy system is proceeding too slowly for the '450ppm' scenario – in which carbon emissions are compatible with a rise in average temperature of no more than two degrees Celsius – to remain plausible except at the cost of drastic policy adjustments⁵². As for energy security, as we have just seen, the deliberate effort by Russia to turn natural resources into diplomatic tools and the U.S. fascination with 'Energy independence' are not encouraging either. Hence the question we now turn to, namely whether, and to which extent Europe and the U.S. – the two remaining 'E7' countries on our list – could provide forms of leadership that could show the way out of such vulnerabilities and make energy a more 'normal' economic sector.

51 Citi, Commodities Strategy, 15 February 2012, p. 1

52 International Energy Agency, WEO 2011, p. 40 and WEO 2012 p. 25.

3 THE EUROPEAN ENERGY POLICY PATCHWORK

Challenged by the decline in its own hydrocarbon resources and by its dependence on Russia on the energy security front, challenged by Asia in its competitiveness, and almost unanimously convinced of the importance of the environmental and climate agenda, Europe stands out among the 'E7' countries for the ambitions and comprehensiveness of its energy policies. To its credit, Europe is the only 'E7' region to have articulated a long-term policy explicitly addressing all three objectives of, competitiveness, sustainability and security through the combination of its internal energy market (IEM), of the Energy and Climate policy Directive, and of its external policy in relation with key producer states and in support of energy governance.

In a first section, we review briefly the impressive European record of moving in barely one decade from no energy policy to today's elaborate and ambitious set of energy-relevant policies. Unfortunately, as discussed the following sections, five factors stand in the way of the outright success Europeans expected:

- (1) The fact that, by construction, the IEM is not, and cannot be a fully integrated market. The founding reason for that is that the original agreement deliberately restricts free investment flows that would not conform to each country's list of acceptable energy-mix technologies. How can one speak of an 'integrated market' in which factors of production cannot move freely in light of economic incentives, as opposed to being constrained by 27 different policies some of which promote decarbonizing through the below-the-radar deployment of lignite-fired plants? Differences in national instruments (e.g. subsidies) and massive interferences by national states and the EU Commission under the Energy and Climate Directive turn the IEM into an administered system that can be called a free market only through a leap of faith regarding how enlightened states and experts can correct 'market imperfections' and resist regulatory capture by well oiled industrial lobbies over a half century time span;
- (2) A readiness to assume away competitiveness considerations under the misleading assumption that all good things will eventually go together and that energy 'affordability' rather than competitiveness is what matters. A failure to assess the rather small impact of the proposed trillion dollar investment in an already mature electric system on the pace of global climate change;

- (3) A policy formulation process turning means – most notably the 'triple 20 by 2020' targets – into ends and ignoring the renationalization trends so clearly at work in all other aspects of European integration;
- (4) An imperfect realization that, in today's globalized world, what Europeans see as *universal* values and imperatives are, for most other countries, *European* values, including on matters of cooperation for climate mitigation – which leaves Europe as a leader without followers;
- (5) The central importance in the ongoing energy transition of a transformation of the German power sector that was designed, according to no less than the German Minister now in charge, with no consideration of implications for other countries.

THE INTERNAL ENERGY MARKET THAT WAS NOT PUT IN PLACE

The IEM was designed in the late 1990s, before climate change mitigation was part of the agenda, as part of the extension of the 'internal market' to the two sectors that had been left out of the 'Europe 1992' program namely financial services and energy. Lowering prices for consumers by making markets contestable throughout the energy value chain was the overarching objective. It was pursued through the same pro-competition principles successfully applied to other network industries such as telecoms and airlines. In addition, the creation of the IEM drew attention to the infrastructures that were needed to interconnect fragmented national markets, leading to greatly appreciated programs to better integrate notably new member countries of Central and Eastern Europe.

In retrospect, if far more worrying concerns had not arisen from a later wave of climate-centred measures, one could challenge some aspects of the IEM as reflecting relatively arbitrary judgments regarding how far regulators should constrain corporate strategies. In particular, the IEM incorporated a top-down choice in favour of a fully unbundled type of industry structure and of the business models it entails on the basis of little more than a four line paragraph in the Commission's Green Book and two footnotes to acknowledge the existence of several types of liberalized power market design and industry structures. Reflecting the assumptions that inspired the UK pioneering deregulation of network industries, a fully unbundled model appears now at odds with the manner in which liberalized industries, including the British electricity industry itself, have further evolved. Competition often comes in the shape of competition among business models, including through vertical integration across segments of the value chain; market forces provide incentives to choose between

market and hierarchy in the most efficient manner⁵³. One can regret that French and German negotiators failed to make these points with enough conceptual clarity when opposing the British-inspired fully unbundled model. In the case of natural gas, as analyzed by IHS-CERA, the financing of new pipeline infrastructures in a deregulated environment may call for less extreme approaches to unbundling⁵⁴, witness the almost systematic granting of waivers from Third Party Access rules that the Commission ends up granting to most large pipeline projects, such as Nord Stream. These and similar issues could make for a lively debate on the best ways to perfect the IEM that Europe must be credited for having legislated into existence. Unfortunately, challenges to the IEM stemming from the different principles embodied in climate policies now dwarf in importance such considerations of optimal competition rules.

One year before the third energy liberalization package to complete the IEM, the 2008 Energy and Climate Directive set three objectives to be achieved by Europe as a whole by 2020: a 20 percent reduction of Green House Gas emission reduction compared to 1990, a 20 percent share of renewables in the overall energy mix energy, and a 20 percent gain in energy efficiency. While the Directive does refer to the three objectives of Competitiveness, Sustainability and Security, in practice the competitiveness element consisted in a restatement of the still to be adopted Third Energy Package put forward by the competition directorate, which, as said, envisioned governments and national champions withdrawing from the scene rather than governments making decisions on, and subsidizing energy production. Quite understandably, working hard to position Europe at the head of a global fight against climate change before the Copenhagen conference disenchantment set in, policy makers focused on the sustainability objective. At that stage, before governments began to step in with one policy mandate after another, one could still hope that the 'triple 20 by 2020' objectives, two of which were translated in binding national targets, would be pursued in an IEM-compatible manner. Ideally, the EU Exchange Trading System (EU ETS) could have internalized the objective to reduce carbon emissions by 20 percent – or any other figure – assuming that the cap and trade mechanism embedded such objectives. Obviously, what proportion of renewables and what role for the (always important) efforts at energy efficiency

53 For instance some oil companies integrate downstream and upstream activities while other do not; most of them have divested from their tanker fleets while BP has for a long time capitalized on specific skills it has in this respect. On market vs. hierarchy, see the transaction cost literature born from notably Oliver E. Williamson, 'Markets and Hierarchies: Some Elementary Considerations,' *American Economic Review*, 63(2), pp. 316–625 and *Markets and Hierarchies*, New York: Free Press, 1975.

54 *Securing the Future: Making Gas Interdependence Work*, IHS-CERA, 2007.

would have gradually appeared as redundant targets – which they actually are from a carbon abatement and climate policy perspective.

THE COST BENEFIT ANALYSIS EUROPE SHIES AWAY FROM

The extra costs that accrue from turning a good communication tool into an economic roadmap would certainly be acceptable if they unlocked large enough benefits. Such is indeed the feeling one could have from reading the European Energy Roadmap, a document laying out how the 2020 objectives could be pursued in the following three decades to reduce overall carbon emissions (i.e. for agriculture, transportation and heat as well as for power generation) by 80-90% from the 1990 level. Reducing emissions from European power plants by 93% or more, as the Roadmap envisions, may sound like a major contribution to climate change mitigation. Yet, as the Roadmap rightly stresses in its introduction, decarbonizing Europe is only a means to reducing *global* emissions. The humbling arithmetic, however, is that the EU electric system accounted for only 4.7% of global emissions in 2008 and will account for less of 3% as early as 2020⁵⁵ and around 1% by 2050 even under existing policies. Actually, the total of carbon emissions from the whole European power generation system is about equal to the 1.4 billion ton of CO₂ equivalent that a group of Chinese researchers recently identified as a *statistical error* in China's 2010 carbon emissions⁵⁶. The fact that five decades of European efforts can benefit the world climate by the equivalent of today's statistical error on Chinese emissions is a humbling call to realism indeed – so humbling as not to be heard as climate policies, like other policies, have a 'feel good' impact that sometimes overcomes the 'do good' dimension.

55 Even assuming they are not reduced, EU power-sector emissions would account for 2.7 percent or 3 percent of total CO₂ emissions associated with, respectively, the WEO 2012 'current policies' and 'new policies' scenarios (WEO 2012, p. 246). In 2035, assuming they have been reduced by 30 percent as planned, they would represent between 1.7 percent and 2 percent of global emissions under the same scenarios. It is safe to say that in the 2040s and 2050s when the EU is contemplating adamantly continuing to decarbonize that same power sector its contribution to the global emissions of the time will be negligible, in the 1 percent range. A conservative look at what the EU Roadmap to 2050 proposes (in which we assume that the world does a little better than under the WEO 'New Policies' scenario) credits Europe therefore with reducing additional emissions by 4% in the 2010s, 3% in the 2020s, 2% in the 2030s and 1% at most in the 2040s and 2050s. In total, a reduction of, at most, 2% over the 2010-2050 period. In a world that will have reached at least 550 ppm of CO₂ atmospheric concentration (more likely 600ppm), the total new addition is no more than a third and no less than a fourth of carbon already in the air. The European credit is equivalent therefore to between 0.5 and 0.7 percent of the total of carbon in the air by 2050. In absolute terms it is of the order of 60 GT or one year of annual emissions spread over 40 years. A half year of climate change delay seems to be therefore an optimistic assessment of what will have been achieved as much of the savings happen late in the game. Factoring in general equilibrium effects (of the type that see Europe offset about half of its reductions in 2011 through imports of cheaper U.S. coal), not to mention carbon imported in the wake of industrial delocalization and outsourcing, the total benefit may well be trivial, to put it nicely. Again, what is at stake is not the intent (Europe should reduce its carbon footprint) but the cost at which a given climate benefit is achieved.

56 Nature Climate Change, June 11, 2012. <http://thinkprogress.org/climate/2012/06/11/497281/china-emissions-gap-actual-reported-co2-equal-yearly-emissions-japan/>

This is not to say that a significant part of Europe's emissions cannot or should not be eliminated through cost-efficient investment in energy savings and lower carbon-emitting technologies. But Europeans have the right to be told, and not just in some footnote, that the costs they are invited to accept will have an incremental impact on the world climate far below what Europe-centric metrics tend to suggest. The proposed two trillion-dollar effort would end up limiting the amount of greenhouse gases in the atmosphere on December 31, 2050 to what it would have been otherwise sometime in the first semester of the *same* year⁵⁷. Benefits may even be smaller – possibly hardly perceptible – if one factors in general equilibrium implications of lower hydrocarbon prices, namely the higher consumption in other parts of the world resulting from prices depressed by reduced European consumption and the delay in mitigation policies by other players if they are triggered by visible signs of climate crisis. Examples of these general equilibrium offsets are very visible in the case of the present U.S. experience as the rapid substitution of natural gas for coal in the U.S. depresses the price of U.S. coal and leads to higher coal usage and imports in Europe.

Pursuing policies at odds with those of other 'E7' countries, Europe prepares to spend about ten billion dollars for each single *day* by which higher electricity bills will postpone reaching a given level of cumulative *global* carbon emissions. Unfortunately, Europeans tend to perceive the policy options in terms of right or wrong – to be green or not to be green – with little concern either for the cost implied by the 'right' move or for the actual benefits accruing from following the right road, ignoring the almost trivial impact that their massive expenses will have on the Earth's climate. The further elaboration of the 'triple 20 by 2020' objectives to full decarbonization by 2050 appears therefore Herculean not just for its trillion dollar price tag⁵⁸ but also, sadly so, for the limited results it would achieve if assessed in the perspective of global carbon emissions. Hercules, one tends to forget, bore the whole weight of the sky on his shoulders only to fall back into slavery; worse, he agonized in unbearable pain for wearing a tunic offered to him in the name of love but poisoned with the blood of centaur Nessus. The danger for Europe is that it will embark on a heroic transformation of its electricity system that will affect the Earth's climate only marginally but could empower central planners, open opportunities for lobbyists, and reduce Europe's competitiveness at the time it can least afford to.

57 Assuming for simplicity sake linear evolutions toward European and global IEA forecast for carbon emissions and in Europe's relative economic weight. See note 55 on previous page.

58 Gerrit Wiesmann, 'Germany faces 'Herculean' task with move to renewables', Financial Times, December 5th, 2011, p.2.

In addition, even the absolute achievements that Europe measures in reference to its 'triple 20 by 2020' objectives may be less robust than it seems: as argued by Dieter Helm, the decrease in carbon emissions that Europe celebrates hide an actual rise in Europe's use of carbon if imports are factored in⁵⁹. More generally, and paradoxically, the targets that are supposed to express Europe's far sighted approach to energy and climate have created a sort of myopia that hides massive increases in the use of coal – the worst possible energy source from a climate perspective – and that leaves major policy arenas poorly attended, first among which the dismal working of the market-based system that could provide the much needed economic references Europe seems to lack. This disregard for costs and for market mechanisms leaves low-income groups exposed to 'energy poverty' effects.

As said, significantly higher benefits-to-costs ratios would be achieved by internalizing climate-change externalities through market instruments – namely through the proper pricing of carbon emissions. This would substitute a bottom-up approach to the top down approach Europe adopts. True, the present EU ETS exhibits excessive volatility in economic downturns, but it can be reformed – as is normal for pilot schemes. In the words of the Cap Gemini consultancy, 'the EU ETS system ... has become inefficient and needs to be urgently reformed'⁶⁰. This can be done for instance by setting a floor price under the price of carbon⁶¹, or by giving the ETS market authority the role of a 'bank for carbon emission credits' comparable to that of a Central bank. Such pricing can even include a 'learning curve' element to put a price on the benefits that each additional unit of green energy has on technological progress. A large body of academic literature exists to show how a carbon tax could be substituted for the carbon emission trading system if governments could not make it work. In any case, reforming the market-based pricing instrument that exists is far preferable to tasking politicians and experts with the choice of which energy mix should deliver lower-carbon emissions for Europe: decisions arrived at in the political arena are likely to reflect the weight and skills of lobbies and of one-issue groups intent on advancing their preferred solutions.

59 Dieter Helm, *The Carbon Crunch: How we're getting climate Change Wrong – and How to Fix it*, Yale University Press, September 30, 2012. We are indebted to Dieter Helm also for analysis of the conflict between the IEM and the climate policy and for his work on how the European production-based measurement of carbon emissions ignores imported carbon and should be superseded with a metric of carbon consumed in Europe.

60 CapGemini, *European Energy Markets Observatory, 2011 and Winter 2011/2012 Data Set Fourteenth Edition*, November 2012, at [European_Energy_MCAPGEMINI_2012_European_Energy_Markets_Observatory_2012_Editorial_arkets_Observatory_2012_Editorial_](#)

61 See Mark Lewis, Head of Commodities Research at Deutsche Bank at <http://www.friendsoftheirishenvironment.net/paperstoday/index.php?do=paperstoday&action=view&id=13005>

In any case, European governments are increasingly unable to meet the costs of these Herculean energy policies⁶². Spain, Portugal and now even Germany have had to significantly reduce the feed-in tariffs and subsidies that guarantee a profit to renewable electricity providers. In addition to their deleterious impact on investors – especially when they apply retroactively as in Spain – such revisions do not correct Europe’s reliance on policy mandates. True, some mandates can be powerful stimulants for action, as can be seen in the U.S. with the CAFE standards for energy efficiency in passenger vehicles. But, as the Commission has begun to suggest, setting mandates for as many types of energy usage as European politicians are inclined to do may result in a regulatory complexity and in poorly thought out trade-offs that exact a price in terms of policy efficiency.⁶³

TURNING MEANS INTO ENDS: THE STILL DEFICIENT EUROPEAN POLITICAL MACHINERY

Worrisomely, the European integration process itself no longer appears as a rock-solid foundation for ambitious policies such as those pursued in energy and the question of European policy coherence and realism must also be asked. As could be seen during the Euro crisis, Europe as is still a half-developed institutional construct. A small number of genuine political agreements between member states are translated into far-reaching policies that are no longer open to the type of democratic check and corrections that would exist within national jurisdictions. What begins as open-ended political compromise is turned into bureaucratic guidelines in which the letter may contradict the spirit and costs may needlessly skyrocket, while major flaws, first among which a poorly designed Exchange Trading System, are left unaddressed. Hence a ‘policy lock-in’ that extends forty years into the future, namely six to eight times the usual time horizon of a democratically elected and fully accountable national legislature. This at a time when more decisive aspects of European construction, not least the common Euro currency, are in risk of collapsing for lack of agreement on new integration steps.

Due to the incomplete nature of Europe’s integration and to very respectable differences in national political cultures and experiences, *European* climate policies are pursued in reality along a patchwork of *national* policies. The latter differ not by

62 As public finances have become strained, and as provision of long-term finance has become tighter due to banking sector deleveraging and new financial regulations, governments look forward to recourse to private capital well above present limited levels. A real burning question nevertheless is how the EU public and private sector can be expected to invest between 1 trillion and 2 trillion euro in Europe’s electricity system before 2030 when its top ten utilities have a combined market cap of only 250 billion euro.

63 ‘Four instruments may be too much’ Interview: EU Energy Commissioner Günther Oettinger on renewable energy targets and emission trading by Sonja van Renssen, European Energy Review, May 29, 2012.

accident but by construction as a result of the seldom mentioned but deeply rooted political compromise between the EU member countries regarding the investment side of energy market policies. The best is infamously the enemy of the good: as observed by CIEP's Coby van der Linde, 'currently [Europe is] creating 27 markets for renewables, each with its own preferences, regulations and support schemes', this while 'the role of gas in facilitating green growth goes largely unrecognized in the Roadmap to 2050 – which mentions it only up to 2030'⁶⁴.

A SMOKE-BUT-NOT-INHALE INDUSTRIAL POLICY

The Roadmap advocates even larger deployment of 'existing technology' – a code word for renewable technologies irrespective of whether they are competitive or not. Operators of power plants not fired with renewable sources are advised to refrain from using the most competitive and capital intensive technologies (i.e. advanced combined gas cycle turbines or nuclear) to prepare for the day when their plants will be limited to a back-up role for intermittent electricity sources. The risk that such command-and-control policies translate into largely unproductive investment is obvious: in 2010, according to statistics of its Ministry for the Environment (BMU), Germany spent no less than 19.5 billion euro to install 7.4 GW of solar capacity⁶⁵ that, according to a quick, conservative calculation, will produce, under favorable assumptions, at best 5 billion Euro worth of electricity over 20 years if valued at the present pre-subsidy *market* price. The counter performance was repeated in 2011 to the tune of a 15 billion Euro investment. The surcharge in consumers' payments amounted to about 25 billion Euro over two years, a sum comparable to the German contribution to the June 2012 emergency loans to Spanish banks. Thousands of large German industrial concerns are exempted from these surcharges, an interesting twist to EU competition rules: passing the bill of export-oriented concerns to captive residential users would seem to resemble dumping of at least the embedded energy content of the exported products. The campaign launched by the German solar industry in 2011 when the government tried to reign in this giveaway was one more reminder that regulatory capture tends to accompany policies that depart from market discipline. On one hand, the German solar industry has created 80.000 jobs, on the other hand, the cost of solar PV electricity is five to ten times higher than that of other energy sources⁶⁶: the perfect recipe for the creation of CAP-style lobby protecting jobs and revenues through what

64 Coby van der Linde, 'Empowering the European Roadmap to 2050 with Natural Gas' World Gas Conference 2012, Kuala Lumpur, June 7, 2012. http://www.clingendael.nl/publications/2012/20120607_ciep_speech_clinde_kuala_Jumpur.pdf

65 Erneuerbare Energien Anlagen in Deutschland 2010, German Ministry for the Environment (BMU), July 2011 and Entwicklung der Enebaren Energien in Deutschland in Jahr 2010.

66 36.8 to 45.6 euro cent per kWh, as opposed to 3.3 for nuclear, 3.8–4.0 for Hard coal, 5.7–6.2 for Natural gas, 6.2 to 6.5 for wind. Canton, J., Lindén, A., Support Schemes for Renewable Electricity in the EU, European Economy, Economic Papers 408 (April 2010), accessed at http://ec.europa.eu/economy_finance/publications/economic_paper/2010/pdf/ecp408_en.pdf.

Hirschman calls ‘Voice’ rather than through the market and its ‘Exit’ route⁶⁷. The additional cost of subsidies for renewable energy is hard to estimate due to the variety of national schemes⁶⁸. In no other industry would one accept almost blindly that massive subsidies must continue to be paid until the 2020s at least so as to preserve a stable investment environment for an industry which abates carbon at a cost several times higher than competing ones – not counting indirect emissions for the construction of PV panels in coal-fired, energy inefficient China.

Temporary disregard of market signals could be justified as a cost that Europe imposes upon itself for the benefit of mankind as a whole – which tends to be the implicit belief of well-intended European policy makers and activists. Indeed, the massive European program of renewable electricity purchase has spearheaded a much faster than anticipated reduction in the cost of intermittent energy, notably solar photovoltaic (PV). PV panels have decreased in cost by 75% in three years. Similarly, the average yield from an onshore wind farm has increased to 34% when it was 21% in 1985. It was assumed that the region making possible such gains through its massive expenditure would recoup some of its costs through an early-mover advantage in green economy industries. Yet the European solar panel industry has emerged in a dire state from these years of European unilateral funding, with dozens of companies joining German leader Q-Cells to bankruptcy. The paradox, rooted in academic and bureaucratic culture, is that Europe, at the same time, interferes with the market in pursuit of what it feels are first-best policies of maximum decarbonization while refraining to intervene when it comes to the location of the jobs that forced taxpayers’ or consumers’ expenses can create. IEA and EU market economists have been trained to never use the term ‘industrial policy’ in their recommendations; policies amounting to picking winners and losers among energy sources are justified therefore in the name of a broad definition of correcting ‘market failures’, with both organizations trying to be technology neutral within the subsector of intermittent energy sources (wind and solar) although they favor that group as a whole above gas or, in some European countries, above nuclear. Such smoke-but-do-not-inhale industrial policies end up supporting China’s more consistent smoke-and-inhale policies.

The decision by the EU Competition Directorate to open an investigation into suspected dumping of solar panels by Chinese producers could be a step towards correcting this inconsistency, except that the EU has in fact subsidized the import of

67 Albert Hirschman, *Exit, Voice, and Loyalty: Responses to Decline in Firms, Organisation and States*, Harvard University Press, 1970.

68 Arash Duero, Sandu-Daniel Kopp (2012): *Green Energy-Green Business: New Financial and Policy Instruments for Sustainable Growth in the EU*. A EUCERS Strategy Paper, Vol.03, May 2012. CES & EUCERS, London.

more than \$25 billion worth of panels from China, creating a powerful external lobby that will continue to demand its share of the spoil – and is likely to get it judging by the overall policy construct. Indeed, a key point in Chancellor Merkel's visit to China in September 2012 was to disavow the initiative taken by the EU Commission Competition Directorate in the wake of complaints by a group of European solar companies led by Germany's Solar World⁶⁹.

Paradoxically, Chinese PV panels and wind turbines happen to be produced in – and to reward – one of the world's highest-carbon, lowest energy efficient economy. How many years must Chinese-produced solar panels operate to merely offset the carbon spent producing them is a question seldom asked when politicians cut the ribbon of yet another solar plant (seven years is the answer this author heard). More generally, as observed by Dieter Helm and his co-authors of the Advisory Report on the European Energy Roadmap⁷⁰, Europe seems obsessed with lowering its *production* of greenhouse gases (GHG) when the performance that should really matter is its *use* of GHG. The UK for instance, stresses Dr Helm, prides itself for having lowered its carbon emissions ('production') by 16% between 1990 and 2005 when it has increased its direct and indirect emissions ('consumption') by 19% after accounting for its de-industrialization and changed trade patterns⁷¹.

A LEADER WITHOUT FOLLOWERS: EUROPE'S KANTIAN POLICIES IN A MACHIAVELLIAN WORLD

Europe presently endeavors to be an altruistic leader in a non-cooperative world organized around the geopolitical lines we described in chapter 2. As students of game theory know, this usually places one in the situation of being taken advantage of by free-riders without achieving the hoped for objectives.

The EU's decision, since then rescinded, to submit foreign airlines flying into or out of Europe to its Emissions Trading System (EU ETS) as of 1 January 2012 provided a telling illustration of the discrepancy between the world as Europe would like it to be and the world as it is. While Europe's ETS – which it hoped is the regional precursor of a global mechanism – is congruent with agreed international objectives and is fair to all airlines competing in the European skies, 33 nations including China, Russia, India and the U.S. met in Moscow on February 23, 2012 to denounce the European measure and reaffirm the principle of national sovereignty as a bedrock of international economic relations. 29 of the participating nations, including the US,

69 <http://finance.yahoo.com/news/eu-solar-panel-inquiry-draws-133446433.html>

70 Final report of the Advisory Group on the Energy Roadmap 2050, Accompanying the document Energy Roadmap 2050 (COM(2011) 885), December 13, 2011. See also Dieter Helms, *Carbon Crunch*, op.cit.

71 webcast.ec.europa.eu/eutv/portal/_v_fl_300_nl/player/index_player_nl.html?id=14133&pld=14126

adopted the 'Moscow Joint Declaration' that lists nine ways in which to 'retaliate'. Brussels' ostrich-like assessment, however, was that the worst had been avoided and that the policy should stick. On March 9, 2012 Airbus reported that a four billion dollar order by Air China had been put on hold, with orders worth between 12 and 14 billion dollars in the shooting line. While an order for 50 planes went through on the occasion of Chancellor Merkel's visit to China in August 2012, most of these orders were still 'frozen' when Ministers of the four 'Airbus nations' met during the September 11, Berlin air show. This disregard by China of even the best intended European climate efforts is all the more remarkable as purchasing the mere 15 percent of the carbon quotas required would cost Chinese airlines less than 40 million Euro in 2013, a trickle compared to the large sums Europe gallantly made available to China under the Clean Development Mechanism. It took the prospect of a US Congress Bill in November 2012 forbidding compliance with the EU regulation to trigger a change in EU policies, which was opportunistically worded as motivated by sudden progress in the international arena. The (legitimate) feeling of doing the right thing for the long-term good of the Planet – a noble sentiment – can blind Europeans to the discrepancy between their enlightened 'Kantian' views, which are based on the ineluctability of leadership by example, and the sovereignty-centric 'Machiavellian' views of the vast majority of countries⁷².

A GERMAN ENERGIEWENDE THAT IGNORES EUROPEAN INTEGRATION

The strategy proposed by the EU Commission to restructure the European electric system gains to be seen in its relation with the '*Energiekonzept*' adopted by the German government on September 28, 2010 and the 'energy transition' (*Energiewende*) that now defines German energy policy under the 2000 Renewable Energy Sources Act ⁷³ and the 2011 Atomic Energy Act Amendment (AtG) and Renewable Energy Act Amendment (EEG).

Germany faces the self-imposed imperative of replacing low-carbon nuclear energy that represents one fourth of its present electricity production with other types of hopefully low-carbon but higher-cost power generation. The '*Energiekonzept*' envisions a reduction by one fourth of German electricity needs by 2050 as well as a massive increase in electricity imports⁷⁴ as the seventeen nuclear power plants presently operating in Germany are gradually dismantled and not replaced. At this

72 Albert Bressand, op. cit.

73 Erneuerbare Energien Gesetz (EEG)

74 Scenarios prepared as a scientific background for the new 'energy concept' by the EWI, Prognos and GWS think-tanks envision that Germany will import between 22 percent and 30 percent of its electricity against 12 percent in the business as usual 'reference' scenario.

stage, the *Energiewende* enjoys significant support in German public opinion. Except for the four larger energy companies, which Germans seem to consider as part of the problem rather than of the solution, many agreed with Environment Minister Röttgen (CDU) when he claimed that '*Due to the Energiewende, the conflict between ecology and economy has finally been resolved*'. Even leaving aside the 350.000 employees in the renewable energy sector many of whom would not have a job if it were not for the very significant mark-ups in consumers' electricity bills, this enthusiasm is all the more remarkable – and fragile – as Germany is in fact among the larger carbon emitters in Europe. At a time when imitating the German model seems to define Europe's ambitions⁷⁵, it is worth noting that, to produce 765 Terawatt-hours, representing only 19 percent of total European power production in 2008, Germany emitted 337 million ton of CO₂ equivalent (toce), a full 32 percent of European emissions. France by contrast produced 614 Terawatt-hours or 15.3 percent of total European electricity while emitting only 51 toce, or 4.8 percent of European emissions⁷⁶. A riddle all seem happy to leave unexplored, including in France, is why France should spend two hundred billion Euro, as French grid operator ERDF prepares to do, to align with the energy transition of a neighboring country that is still two decades away from achieving the much lower French emission levels. Furthermore, Germany is quietly building ten GW of new coal-fired and lignite-fired power plants that will emit about 58 mtoce, more than the whole French electric system presently emits. The 'German renewables advocacy coalition', to use blogger Rick Bosman's description⁷⁷, has achieved a level of influence over energy policy that some compare to that of the oil industry on U.S. politics; and yet it has done so in a way that does not really displace the power of the coal and lignite lobby. Quite remarkably, through a 'grandfathering' clause that applies to even the newborn coal-fired plants until 2013, that lobby managed to turn the EU ETS from a tool to *discourage* coal use into one to *reward* it. Interestingly, the coal US utilities have stopped buying in the wake of market-led development of US gas resources is now finding its way to Europe, in complete contradiction with the latter's ambitions. As Dieter Helm makes the case in his book, Europe's climate policies are almost invisible to the naked eyes when one looks at actual carbon emissions.

75 Among many apologies of the German model, see 'Allemagne: le bon élève de la classe mondiale', *Le Monde, Eco&Entreprise* special issue on the green economy, June 20, 2012, p. 5.

76 Source: IEA, October 2010, reproduced in *Key Figures on Climate France and Worldwide*, 2011 Edition, CDC Climat, section 3.1. This includes emissions related to city production including CHP plants and emissions in auto producer plants. Reductions in these emissions levels over the 1990-2008 periods were 9.2% for Germany, 8.7% for the UK as opposed to an increase of 10.1 for France.

77 Rick Bosman 'How Germany's powerful renewables advocacy coalition is transforming the German (and European) energy market'. *European Energy review*, February 27, 2012, www.europeanenergyreview.eu/site/pagina.php?id=3552

The inspiration derived from the *Energiewende* policy for Europe as a whole is also helping legitimize ill-timed transfers to Germany, the one member country that needs it less. A program of interconnection of the European grid is proposed to reduce the cost of intermittency by pooling wind and solar energy from a larger area and to provide Germany with outlets for its solar and wind electricity when it exceeds demand. Such interconnection however will only raise the 'capacity factor' of intermittent energy from less than 10% presently to the low or mid-teens⁷⁸. Its extension to North Africa is advocated to carry solar energy from the Sahara under the Desertech project. At a time when competitiveness differentials are stretching the Eurozone to the limit, such policies would gain to be seen in relation to Europe's broader integration agenda. According to the CEO of Solvay, one of the world's largest chemicals groups, 'energy costs should be ranked alongside the Eurozone crisis as the most urgent problem facing the industry'. And yet, the CEO of a large power group interviewed by the FT can deplore that European energy policy is decided with 'zero attention to competitiveness'⁷⁹. Part of the reason may be that, according to a study by Greenpeace and Green Budget Germany, the 300 largest German industrial energy users receive a subsidy of about 9 billion Euro for their energy needs, of which 3.7 billion from the cross-subsidization of 90 percent of their renewables feed-in tariffs by retail consumers⁸⁰.

FROM GREEN AT ANY COST TO COST-EFFECTIVE GREENING

Two decades ago, Europe went through a tough but worthwhile 'German shock' as a result of German reunification, a landmark transformation that was enthusiastically supported but that made Germany the first member country to break the Eurozone's Growth and Stability Pact, seeding the ground to the present financial turmoil. The second Germany-induced shock is the one-size-fits-all exchange rate for the Euro that has served Germany well but many of its partners not so well, especially with the European Central Bank less than a fully-fledged central bank. In light of its key role in the present phase of crisis management and fiscal integration, one hopes Germany will avoid creating a third 'German shock' to the EU integration process in the name of home-grown views on the desirability of intermittent energy, coal and lignite. Germany would show true climate leadership by reassessing energy expenses

78 The capacity credit of a power plant, usually expressed as a share of its nameplate productive capacity, is the production that can be considered 'firm capacity', namely available at any time. Capacity credit for wind in Europe as assessed in literature ranges from 5-6% in Germany at 45% capacity penetration level to 15% in the UK at 29% penetration and to 8-14% for Europe as a whole depending on interconnection capacity. See Nora Meray, *Wind and gas: Back-up or Back-out, That is the Question*, Clingendael International Energy Programme, December 2011, pp. 5; 15-19, and Van Hulle et al., 'Integrating Wind – Developing Europe's Power Market for the Large-Scale Integration of Wind Power', final report Tradewind, 2009.

79 James Boxell, 'Solvay chief warns Europe on energy policy', *Financial Times*, May 14, 2012, p. 16.

80 <http://www.renewablesinternational.net/debate-over-cost-of-renewables-in-germany/150/537/39046/>

in light of their limited impact on climate change and of the un-necessary costs they impose on countries struggling to reduce public expenses at German urging. Europe, meanwhile, will gain to avoid emotion-driven mandates, discipline the coal and lignite lobby, and place a reformed, market-based EU ETS at the centre of EU climate policy. Moving to this market-centric posture should be done in a way not discouraging investors.

Altogether, the transition Europe needs to make should properly balance sustainability and competitiveness. Asking European ratepayers to pay ten billion dollars for each day by which global warming is delayed is not only excessive but, in the end, economically and socially unsustainable; it may also unfairly exacerbate Germany's advantage. Easily communicated targets, first among which the '20-20-20 by 2020' target, were useful in creating a sense of momentum and 'getting started'; the time has come for Europe to take the full measure of what it is achieving and not achieving in the world as it is – a world in which Europe is a relatively marginal player including when it comes to moral persuasion as could be seen during the infamous dialogue of Commissioner Heidegaard and her Indian counterpart at the Durban conference.⁸¹ The time has come to give the market a central role and outgrow the initial high-emotion, low-efficiency model of energy transition. In the words of Duero and Kopp 'Policymakers need to create the necessary conditions to ensure that financial markets become a central lever for investments in Europe's eco-industry.'⁸² In addition, subsidizing technologies until they become grid-competitive cannot 'correct market failures' under almost any condition, notably when subsidy systems turn out to generate market failures and policy failures of their own, not to mention providing political-cover for the development of coal-fired and lignite-fired plants as part of the 'transition'. Europe was off to a good start in the mid 2000s; its hopes of being more widely followed have not come true however. The time has come to look at the broader world without complacency, to move from good intentions to cost-effective results, and to not let the letter of quantified targets defeat the spirit of a well-intended energy transition.

81 Commissioner Heidegaard was widely credited for having saved the day through a firm stance vis a vis BASIC countries, even if at the cost of a truly tense moment with her Indian counterpart (see <http://www.guardian.co.uk/environment/2011/dec/11/connie-hedegaard-durban-climate-talks>). Non-Annex 1 countries shunning 'binding commitments', the compromise was to agree on the need for 'an agreed outcome with legal force'. Whether that 'outcome' consists of commitments by all countries remains to be negotiated. For a spirited EU account of how consensus may grow from contradicting interests and world views, see Commissioner Heidegaard My article 'India: a major player and constructive force in Durban' at http://ec.europa.eu/commission_2010-2014/hedegaard/headlines/articles/2011-12-16_01_en.htm

82 Duero and Kopp *op. cit.* p. 41.

4 US ABUNDANCE OF NATURAL GAS AS A GAME CHANGER

Energy circumstances, political as well as economic, could not be more different on the other side of the Atlantic where North America as a whole is on its way to producing almost as much oil and gas as it uses and of reducing its carbon foot-print in the absence of a climate policy. According to the EIA, shale gas has increased from 4% in 2005 to 24% as a proportion of America's overall gas production. While Europe sees its own dependence vis-a-vis Russian gas increase steadily, the U.S. has managed to add almost one century's worth of economically viable reserves of natural gas as the result of favourable geological conditions and of adamant innovation efforts by independent companies. A drilling industry almost twenty times larger than the European one and employing six hundred thousand is leveraging these game-changing innovations – notably the use of hydraulic fracturing or 'fracking' to access hydrocarbons in low-permeability rocks – to develop 'tight oil' and other unconventional plays. The economics of shale gas production in the US in a low-price environment, like exists presently, can be surprising as companies often face a choice between producing at a loss and giving up on leases that impose strict drilling and production obligations upon them. While some companies have made impressive progress at reducing production costs (in some cases below \$1 per million British Thermal Unit – mbtu), other like Chesapeake have begun moving rigs out of shale gas plays towards tight oil plays or liquid rich plays, but drilling efficiency keeps improving and the US faces an excess of gas supply compared to what the present logistic can handle and to what can be sold profitably. To some extent, natural gas is becoming a by-product of oil production or is made profitable thanks to associated liquids. In any case, exporting some of that gas becomes an almost unavoidable consideration, even if one that still needs to be reconciled with a U.S. energy policy that still reflects a net importer's energy-security perspective.

'ENERGY INDEPENDENCE' OR ENERGY LEADERSHIP? THE U.S. DILEMMA

While Canada prepares to export liquefied natural gas from three major LNG plants at or near Kitimat in British Columbia, the U.S. has been debating, not without some reluctance, whether it should export LNG without being in contradiction with its aspirations to 'Energy independence'. The striking difference between the two neighbouring countries reflects the fact that Canada – a country used to see itself as a resource exporting economy – plans to export LNG from green-field projects

designed with the global market as their normal outlet whereas the US has begun to evolve a radically different business model in which the gas to be liquefied and exported comes 'from the grid'. Indeed, in an August 7, 2012 finding denying a Sierra Club's motion that export of US LNG would cause new and environmentally questionable production of shale gas, the US Department of Energy ruled that there was no way to identify precisely whether the gas to be liquefied would come from existing conventional, from existing shale gas plays, or from new production triggered by the very existence of export opportunities. This evolving business model also breaks away from the fully-fledged 'take or pay' model, enabling buyers to commit only to the purchase of a given amount of liquefaction services but not to the actual purchase of the commodity itself. These models however are still evolving while none of the proposed liquefaction plant is operating yet and the political controversy is far from having abated.

Initially, after U.S. companies had to take delivery under take-or-pay contracts of liquefied gas from foreign sources that they no longer could sell into the domestic market, LNG projects were limited to the re-export of imported LNG to the exclusion of on-the-spot liquefaction. Cheniere Energy, then a small terminal operator, was the first to go beyond this narrow trading approach and come up with ambitious plans for the transformation of its import platform at Sabine Pass, Louisiana, into a two-way terminal able to export gas that would be liquefied from the supply of U.S. 'hub gas'. Cheniere Energy applied for licenses to export gas both to countries linked to the US by a Free Trade Agreement (in which case the license is relatively easy to obtain) and to the rest of the world (for which licensing authorities enjoy a much higher degree of discretion in reviewing the merits of the application). At first, the project was seen as that of a maverick company eager to recoup its grossly underused investment in a 'regas' import platform at the cost of an even riskier bet – ready to invest upward of three billion dollars into liquefaction trains to make good on a one-billion dollar or so logistical infrastructure (deep water harbour, jetties, storage, connecting pipelines, land). Two associations of U.S. gas users protested what they perceived as the risk of diverting cheap natural gas from the U.S. to overseas competitors⁸³. Cheniere's game-changing approach was rapidly imitated, with ExxonMobil and Qatar Petroleum for instance also applying in August 2012 to turn their Golden Pass regas terminal into an LNG export platform, a \$10 billion investment and a 15.3 million ton per annum export prospect⁸⁴. Incidentally, the

83 Michael Levi, 'A strategy for U.S. natural gas exports', Brookings, June 2012 <http://www.brookings.edu/research/papers/2012/06/13-exports-levi>

84 http://www.gulf-times.com/site/topics/article.asp?cu_no=2&item_no=526124&version=1&template_id=57&parent_id=56

prospect of Qatar exporting U.S. sourced gas is an interesting symbol of changes underway. Similarly, on 21 August, 2012, China Investment Corporation's (CIC's) decided to take a \$1.5 billion stake in Cheniere's LNG export plants at Sabine Pass.

Time has come for the U.S. to move from a defensive view of global energy relations to a constructive one in which expanding U.S. resources can be leveraged toward of a better functioning market-driven energy system in support of secure, sustainable and competitive supplies. US competitiveness and the re-industrialization trend that cheap gas seems to be starting will not be compromised by LNG exports as costs of liquefaction and transportation are such that U.S. gas will only be available to foreign buyers at a prices four to six dollars above U.S. domestic prices (which are presently hovering between two and three dollars per mbtu). Some broader security aims could also be served: according to Pakistani newspaper *The Express Tribune*, USAID approached Pakistan in January 2012 with suggestions that U.S. LNG could be a competitive alternative to Iranian gas⁸⁵.

More generally, the black-and-white contrast between producer and net-importer perspectives is giving way to a hybrid situation in which major exporters like Saudi Arabia depend on demand-side policies to maintain their long term export capacities while the U.S. has still to consider the new opportunities associated with significant exports of hydrocarbons.

FROM THREE FRAGMENTED GAS MARKETS TO AN INTEGRATED MARKET

So far, and for reasons related to notably the Japanese 'gold plated' approach to energy supply, potential U.S. gas exporters see the oil-indexed markets of Japan and Korea as the prized targets. Nevertheless, BG (formerly British Gas) and Gas Natural Fenosa, the largest Spanish group, were the first European companies to contract with Cheniere Energy for LNG from its Sabine Pass terminal. These contracts, which, as said, did not incorporate the usual take-or-pay rule except for the liquefaction fee, were seen at first as reflecting specific company supply constraints. Gazprom is losing no opportunity to dismiss US shale gas, or at least the present low prices of U.S. gas, as a temporary aberration; for a long time larger groups like French company Total S.A. invested in U.S. shale gas also remained dubious of the American capacity and willingness to export gas to Europe, such concerns being probably heightened by concerns over their own expensive projects to produce oil-indexed

85 Zafar Bhutta, 'Lobbying: US lures Pakistan with cheaper gas than Iran', *The Express Tribune*, Islamabad, January 25th, 2012.

gas in Arctic Russia⁸⁶. But the development of a large scale market for liquefied gas in the Atlantic basin is now within reach and should be pursued including through proper political dialogue in the otherwise anemic trans-Atlantic economic community. According to energy consultancy IHS CERA, the U.S. could export about 12 billion cubic feet of gas a day if all licenses under review were granted, which is only ten percent less than Russian sales of gas to Europe⁸⁷. What is lacking however, is a legal and political framework in which to develop a fully-fledged gas-to-gas competition as exists in the U.S. market. The transatlantic dialogue on this theme is limited to exchange of views on 'best practices', a subtle reference to European concerns with fracking techniques and to the decision of countries like France – a country acting as if swamped in trade surpluses, over-employment and state fiscal surplus – to leave gas in the ground for fear of not being able to design a proper regulatory framework – or for fear of change.

Like the proverbial blind wise men trying to figure out the shape of an elephant, Europe, the U.S. and their 'E7' partners are therefore projecting their own idiosyncratic worldviews onto the common 'triple agenda', whether the European view of a bright and costly future in which the reduced amount of energy still needed in Europe comes from intermittent renewable sources, the U.S. view in which domestic molecules keep the country 'Energy independent', or the Saudi view in which supplying the global market for oil in an efficient and predictable manner defines the policy horizon while ill-designed subsidies eat into the country's export capacity. Leveraging the present U.S. advantage in natural gas in support of greater convergence on matters of energy security, sustainability and competitiveness would benefit the U.S. far more than energy protectionism ever could. It would also help Europe pursue its worthwhile sustainability objectives at a lower cost to customers and to taxpayers. It would also avoid a third 'German shock' to European integration whereby decades of subsidies to German coal and lignite are doing to Europe's green aspirations what German public deficits once did to the Maastricht criteria: breach them under the name of pragmatism before imposing them self-righteously to the rest of Europe. Last but not least, promoting faster integration of European, Asian and American markets for natural gas would offer Russia an opportunity to trade its present approach to diplomatic strength through energy dominance for the more challenging but more rewarding opportunity of developing a diversified economy freed from multiple levels of rent capture.

86 Statement by Total SA's CEO Mr. de Margerie, February 2012.

87 Christopher Swann and Kevin Allison, 'U.S. eyes supply-side economics of natural gas', Reuters Breakingviews, January 3, 2012.

In this decade, the central element in this 'energy aggiornamento' initiative would be a deliberate effort to create a genuinely liberalized global market for natural gas through higher levels of U.S. exports of Liquefied Natural gas (LNG) not just to the high-priced Asia markets, but also to Russia-dependent and fracking-terrified Europe. Such an initiative requires further innovation in the business models behind LNG investment and trade as well as adjustment in the U.S. policy thinking still attuned, as shown in the two Markey Bills, to a rather shortsighted view of 'Energy Independence'. The Transatlantic partners, who canceled their 2010 Annual Summit and no longer schedule summits regularly, for lack of subjects to discuss (sic), should coordinate so that this initiative coincides with a more meaningful dialogue with Russia.

5 CONCLUSION

THE ROAD AHEAD

Altogether, as rightly identified in Europe's 2008 Climate and Energy Directive and 'Energy Roadmap to 2050', the energy transition underway calls for careful reconciliation of the three major objectives of energy security, sustainability and competitiveness. As we showed, international governance is far too partial and fragmented for these objectives to be achieved in the market-driven manner that is taken for granted in most other parts of the economy. As a result, geopolitics is more relevant than ever to the energy scene, not simply for narrowly defined 'security of supply' issues but also for the manner in which countries cooperate or compete around the sustainability agenda and on the world scene. The 'E7' countries of Saudi Arabia, Iraq, China, Japan, Russia, Europe and the U.S. are presently the most noteworthy in combining quantitative market impact with policy and geopolitical influence across all three objectives. 'E20' countries such as Canada, Venezuela, Brazil, Iran and India also play a significant role although not one that can presently shape energy relations in such an across-the-board manner.

As we saw, four of the 'E7' countries pursue their own national objectives of security, sustainability and competitiveness within the world energy system as it is – even when they are themselves a major source of change like China is. Key issues in their case have to do with the scope, reach and effectiveness of policy formulation. How fast China reduces its high levels of excessive energy-intensity and carbon intensity; how effectively Iraq develops its energy resources – itself a function of its unresolved political integration agenda – and whether Saudi Arabia complements its supply-centric policies with demand policies appropriate for the major consumer country it now is: all these will strongly influence oil price trends, still an essential benchmark for the energy system as a whole. Impressive decline in oil usage by OECD countries, including the US, will continue to play an essential role in letting China pursue its 'peaceful rise'. Surprisingly the true competition for oil will be between China and the producer countries themselves. Meanwhile, in the wake of its Fukushima natural, corporate and regulatory disaster, Japan depends upon, and could influence natural gas markets in a very significant way. Its dependence on gas imports may further expose the cost paid for lack of domestic competition and for industry-captured regulatory structures. If exports of U.S. gas from the grid develop briskly, changes in Japanese buying patterns may also subject oil indexation of natural gas to commercial challenges, with major potential repercussions for Eurasia.

Of all 'E7' countries, Russia is the one most at ease with the geopolitical nature of energy relations. And yet Russia's impressive successes are now challenged by the revolution underway in hydrocarbons, most notably in gas. Based on innovations by independent companies supported by open, liberalized infrastructures, the 'shale gas and tight oil revolution' exposes major vulnerabilities in Russia's approaches. Whether this revolution can extend beyond North America, and whether LNG will make pipeline-centric strategies irrelevant is still an open question. Russia however is already finding it more difficult to develop technically challenging upstream fields in the Arctic and may already be over-investing in costly 'pipeline wars'. The latter are predicated on a distrust of Ukraine (a rather small player actually), on persisting fragmentation of the European gas market and on a Russian effort to limit the impact of EU policies seen in Moscow as discriminatory for reasons probably reflecting their inward-lookingness rather than European ill intents. Betting on the persistence of such conditions may or may not pay off for Russia; yet disappointing results in rebalancing Russian gas exports toward China illustrate how strategic visions can fail to be validated in the market place and may instead open the way for third parties to play their own cards – as Turkmenistan successfully did with China.

Europe, in contrast to Russia, has still to see energy in a geopolitical perspective embracing economic competition in today's increasingly BRIC- and U.S.-centric economy and energy system. Europe should be credited for having invested significant resources in promoting a global governance based on more enlightened principles than national sovereignty and national interests. Unfortunately, signaling deeper rejection of Europe's attempted and well intended leadership, the U.S., Russia, China, India, Saudi Arabia and 25 other countries overcame their many differences to unambiguously rebuke Europe's efforts at providing a regional alternative to an ETS for international flights. They even agreed on nine forms of retaliation for Europe's financially innocuous but philosophically disturbing initiative. The difficulty for most European policy makers to read the writing on the wall illustrate how far Europe's farsighted views of the world can be from diplomatic and economic reality. The Kantian ideal of 'universal peace' – or its modern re-expression as a spreading coalition of the willing – tend to founder against Machiavellian views of what emission rights and financial transfers should be granted to countries competing to catch up with, rather than to emulate Europe. A market-based approach to the pursuit of sustainability appears, we suggested, as the most appropriate way for Europe to remain faithful to its ideals in ways that do not compromise the competitiveness of the European economy and, possibly, the European integration process itself. This may actually be more climate-efficient than the present focus on policy mandates that hide significant regulatory capture by

notably the coal lobby, conflicting national policies and major departures from IEM market disciplines. The 'market failures' that need correction are not those of letting the good displace the best when picking the low hanging fruits of decarbonization on the U.S. model; they are the risks of compounding the loss of competitiveness of a large part of Europe as a result of excessive energy prices and of ill timed subsidies to Germany and its hybrid model of green hearts, brown clouds and morning-after Europeanization of unilateral policies.

With the 'E7' countries pursuing objectives so different along national rather than international strategies, the geopolitics of energy will be complex and robust, pitting together not just countries but worldviews and governance principles. A strategic, game theory approach acknowledging the variety of objectives and policies is in order least one wants to end up in the wrong box of the prisoner's dilemma. The objective of a global governance based on market principles and cooperation can, and should still be promoted even if along more realistic lines. As a catalyst toward that broader agenda, time is ripe, we suggested, for a trans-Atlantic initiative to promote deeper integration of the world's three major regional gas market around a common price discovery system based on competition among gas sources. An integrated market for natural gas can be a key stepping stone in a broader architecture which needs to include, as shown, a far better managed pricing system for carbon emissions in Europe and globally. Market discipline, a less complacent sense of geopolitics, a more reasoned idealism are the best allies for sustainable generosity and environmental enlightenment. Each of the 'E7' countries has major cards to play, with the U.S. hand presently the most impressive even if lacking a clear inspiring vision beyond the tired slogan of 'Energy independence' in the midst of interdependence. Understanding what game is really being played is a good start toward a more cooperative play in which real leadership comes from resources and from economic success at least as much as from good intentions.



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