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ÉCONOMIE DU DÉVELOPPEMENT DURABLE
ET DE L'ÉNERGIE

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Russia and China hydrocarbon relations: A building block toward international hydrocarbon regulation?

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This article is a first step of a research agenda on international hydrocarbon regulations. With regards to both: i) the new wealth and power equilibrium in the international political economy and ii) the new political economy of carbon that is emerging from The Paris agreement on Climate changes, this research agenda aims at analysing the changing national structures of governance and the ways these changes lead to international, bilateral, plurilateral or multilateral hydrocarbon regulation.

The analysis of the recent developments of China-Russia energy relations is the first step of our reflexion concerning the probability of an international framework dealing with hydrocarbon issues.

The agreement on natural gas signed by the Russian company Gazprom and the China National Petroleum Corporation (CNPC) in May 2014 and the many existing oil agreements involving Rosneft and the CNPC testify to the profound changes in both Russia and China's oil and gas policies. The agreements are signed by companies of two main countries structuring the world hydrocarbons markets and can therefore be supposed to have strategic impact. The massive growth in oil and natural gas imports by China has made it a major player in these markets. China's energy policies are likely to evolve both in economic terms (price, volume) and in terms of geopolitics and more generally in terms of the structure of governance (Hebert 2015). Meanwhile, Russia – the world's second producer of oil and natural gas but also the first exporter of natural gas and a substantial oil exporter – is essential in maintaining balance in supply and demand.

For both countries, oil and gas exchanges are part of a broader diversification strategy aimed at responding to energy security concerns in the two dimensions of supply and demand. China's objective is to ensure a supply of gas through a diversification of suppliers and import routes (security in supply) while Russia aims to diversify its export markets to guarantee a demand for its gas. Gazprom's strategy in diversifying its export markets is supported by the Russian State and clearly represents the company's response to uncertainty linked to its main export market - the European Union. Its "Asian" strategy can thus only be analyzed with reference to evolutions in the European gas market.

These exchanges are based on specific institutional mechanisms which involve bilateral contracts between State companies backed up by bank loans and sometimes asset exchanges and investment along with diplomatic initiatives regarding energy. These modalities define this method of managing energy security which tends to be in opposition to the competitive and multilateral governance model favoured by the EU, the United States and the Energy Charter.

These divergent approaches are linked to models for the organization and regulation of gas industries which differ greatly according to the institutional environments involved. This characteristic is justified by the hypothesis of alignment between the structure of governance and the institutional environment found in neo-institutionalist theory (Williamson 2005; Brousseau *et al.* 2011). In this way, while the reorientation of oil and gas exports from Russia towards China is still in its early stages, it is based on an "institutional convergence/complementarity" between Russia's gas industry and China's whereas profound institutional divergences mark relations between the EU and Russia (Shadrina 2014a; Romanova 2014; Locatelli 2013).

We stress the importance of the contractual norms which structure the energy interdependency of the countries involved. As there is not an international multilateral or regional framework able to manage the energy supply security and sovereignty issues, the way the countries involved construct their energy interdependency to an extent defines models of sectorial governance. The importance of bilateral partners (China and Russia) leads us to argue in favour of *bottom-up* regulation of energy industries. For this reason, this agreement will have instutional implications for the both protagonists but above all on the international stage. It will have an impact on the instutional trajectory of future bilateral, regional and/or multilateral agreements.

1. The growth of hydrocarbon exchanges between Russia and China: the fundamental economic basics

Oil and gas exchanges between Russia and China have increased considerably since the start of the 2000s. China's oil imports from Russia have grown by nearly 121% between 2007 and 2014 (see table 1). The first long-term contract for the supply of natural gas signed in 2014 provided for annual supplies of 38 Bcm of Russian gas and should enable significant growth in what had been insignificant levels of imports. A second contract was being negotiated and should raise these imports to over 68 Bcm by 2030 which would represent nearly 20% of Chinese gas consumption (Jaffe *et al.* 2015).

It was essential to take the economic basics underpinning these exchanges into account. Firstly the increase in China's oil consumption has led to China becoming the world's second oil importer after the United States (6.9 Mb/day of crude oil and petroleum products in 2013). In the medium term, Chinese oil requirements should continue to grow although at a lesser rate than during the 2000-2013 period. In 2040, it could be between 15.7 Mb/day (according to the IEA's WEO for 2014) and 18 Mb/day (for the reference scenario from the Asia/World Energy Outlook 2014 published by the Institute of Energy Economics, IEE). By 2030, then, China could be the world's first oil importer (IEE 2014). The forecast levels for natural gas consumption were similarly high and will partly depend on the climate policy China adopts (natural gas could establish itself as a "transitional energy form" and replace coal for electricity production). Forecasts on gas requirements for 2040 vary from 603 Gm^3 (according

to the IEA's WEO for 2014) and 753 Gm^3 (for the reference scenario from the Asia/WEO 2014 by the IEE).

As for Russia, it possesses immense gas reserves in Eastern Siberia and the Russian Far East and intends to put these into production primarily with a view to developing these regions economically (Shadrina & Brashaw 2013). According to Russia's Energy Strategy, Eastern Siberia and the Russian Far East should be producing 18-19% of the country's oil and 15% of its gas by 2030[1].

Table 1: Gas resources in the Russian East and Far East in 2013 (trillions of m^3)

	ABC1 (reserves)	Resources	Total
Siberian Federal District	2.6	31.7	37.9
Far Eastern Federal District	1.35	12.0	14.6
The East Siberian and Laptev Seas			5.6
The Chukchi and Bering seas			2.7
Sakhalin	0.9	5.4	6.6

Sources: Henderson & Pirani (2014); Presentation de Gazprom (2013). *Gazprom in Eastern Russia, Entry into Asia-Pacific Markets*. (13 June).

The development of these reserves should begin with the creation of a production centre in Yakutia based on the gas well in Chayandinskoye whose reserves come to over 1.2 trillion m^3 (Gazprom, 2014). This should begin production as of 2018 and produce 25 Gm^3/year of gas (Henderson & Stern 2014). Other gas wells were likely to subsequently go into production such as those in Kovytka (Irkutsk region) or Talakan (Sakha Republic). These developments were part of the much vaster overall *Eastern gas program* adopted in 2007, whose objective was the coordinated and unified development of a system of production and transport (gas pipelines) in Eastern Siberia and the Russian Far East. Overall then, the creation of four production centres was planned - in Yakutsk, Irkustk, Krasnoyarsk and Sakhalin (Paik 2012).

2. Exchanges which respond to concerns about energy security

On both sides these exchanges were an integral part of diversification strategies responding to concerns about energy security as the IEA understood them in 2001. The Agency defines energy security in terms of the "physical capacity of suppliers to satisfy demand at a given price"[2]. This definition included a volume dimension linked to a reliable energy supply which was available in sufficient quantity and an economic dimension linked to aspects of price volatility and levels. Consequently, the Chinese strategy aimed at making its supply secure by diversifying its oil and gas suppliers responds to the Russian strategy of making demand for its products secure by open up new export markets and reducing its dependency on Europe.

[1] *Energy Strategy of Russia: For the Period up to 2030*. Institute of Energy Strategy, the Russian Federation's Energy Ministry, 2010, Moscow.

[2] This definition of energy security has been broadly quoted in literature on the subject. C. Winzer (2011) even considers it the only truly acceptable definition.

- *Growth of Chinese energy dependency and the importance of energy*

The development of hydrocarbon exchanges between China and Russia was a major part of the Chinese supply diversification strategy which aims to respond to the problem of energy security created by growing dependency on hydrocarbon imports. The question of energy security has thus become a major axis in Chinese energy policy characterized since 1949 by a drive for self-sufficiency regarding supplies (Andrew-Speed 2014). In the light of that, the idea was essentially to reduce dependency on the Middle East for oil. In the 1990s, this region was a marginal supplier and then increased supply to provide between 45 and 55% of Chinese oil imports in the 2000. In 2014, Saudi Arabia alone provided over 16% of China's crude oil supplies (see table 2).

Table 2: China's main crude oil suppliers from 2007 to 2014, Mb/day

	2007	2008	2009	2010	2011	2012	2013	2014
Saudi Arabia	0.53	0.73	0.84	0.9	1.0	1.08	1.08	0.99
Angola	0.50	0.6	0.64	0.79	0.63	0.80	0.82	0.86
Russia	0.29	0.23	0.31	0.31	0.37	0.49	0.49	0.64
Iraq	0.03	0.04	0.14	0.23	0.28	0.31	0.47	0.57
Iran	0.41	0.43	0.46	0.43	0.56	0.44	0.43	0.55
Others	1.45	1.56	1.66	2.16	2.23	2.30	2.38	2.53
OPEC	*1.81*	*2.26*	*2.62*	*3.03*	*3.17*	*3.58*	*3.62*	*3.72*
Non OPEC	*1.40*	*1.32*	*1.44*	*1.75*	*1.90*	*1.84*	*2.04*	*2.38*
Total	3.21	3.58	4.06	4.78	5.07	5.42	5.66	6.1

Source: Meidan *et al.* (2015)

The same strategy for the diversification of suppliers was required for natural gas. Through its supply contracts, today China has four major sources for natural gas with imports via pipelines and imports in LNG. In 2013, China imported 25 Bcm of LNG mainly from the Qatar (38% of the Chinese LNG supply) and then from Australia. For the next 20-30 years, the different contracts signed (as of end of 2014) ensure China a supply of around 70 Bcm of LNG. Pipeline supply (27.4 Bcm in 2013) arrives from three main sources - imports from Myanmar, Central Asia (Turkmenistan, Kazakhstan and Uzbekistan), soon to be joined by imports from Russia. The Central Asia-China pipeline has a capacity de 55 Bcm/year which could rise to 85 Bcm by 2020 while the Myanmar pipeline's capacity was 12 Bcm/year. Finally, the *Power of Siberia* from Russia will enable the addition of 38 Bcm/year to the Chinese supply by 2020[3]. This capacity could be increased to 60 Bcm/year and a second Russian gas pipeline (the Altaï project) with a capacity of 30 Bcm/year may also add to this figure.

From this standpoint Eurasia clearly has an important card to play. Its oil and gas supply was mainly provided via pipelines and therefore does not pass through the Strait of Malacca which the Chinese authorities still view as an unsafe route. The strategy of supply securisation was twinned with an equally important focus objective namely making sure hydrocarbons supply channels were secure (and therefore diverse.

[3] It should be noted that the credibility of Russian LNG policy will be enhanced when the *Power of Siberia* project comes into service and capable of improving the profitability of certain LNG projects. This will enable LNG projects to be supplied with gas from Vladivostok where a liquefaction plant is to be built to supply other major consumers in that part of the world, particularly Japan and Korea.

- *Asia: Gazprom and Russia's strategic response to uncertainties in the European gas market*

Meanwhile the Russian State and Gazprom have committed to a diversification policy for their export markets with the aim of making their markets and demand secure. Defined in the 1990s, this policy was developed in the 2000s and 2010s and was clearly part of the long-term Energy Strategy for 2020 and 2030. This strategy provides for gas exports to Asia of around 75 Bcm by 2030 with this zone supposed to represent 19-20% of gas exports compared with the current figure of 1% and 22 to 25% of the country's oil exports as compared with 6% currently. China has thus become an important oil export market for Russia (0.64 Mb/day in 2014, see table 2). Numerous projects were envisaged for natural gas involving LNG ans gas supplied through pipelines (table 3) although current conditions make profitability uncertain at least for certain of these initiatives. Currently the contract signed by the Russian company Gazprom and the Chinese company CNPC in May 2014 was the first concrete expression of a significant reorientation of Russia's gas exports.

Table 3: Russia's main LNG and gas pipeline projects for exports to Asia

Projects	Main players	Gas wells	Capacity	Start up	Target markets
LNG					
Vladivostok LNG	Gazprom	Sakhalin 3, Kovytkta, Chayanda	3 lines of 5 Mt/year	1 line: 2018 2 line: 2020 3 line: ?	Asia including Japan
Yamal LNG	Novatek (60%), Total (20%), CNPC	Yuzhno-Tambey (Yamal)	16.5 Mt/year	1 line: 2017 2 line: 2018 3 line: 2019	Europe and Asia
LNG project in the Gydan peninsula	Novatek	Salmanovsk and Geofizik			Asia
Sakhalin 1	Rosneft-ExxonMobil	Sakhalin I Mer d'Okhotsk	5 Mt/year	1 line: 2018	Asia-Pacific
Sakhalin 2 (1)	Gazprom-Shell	Sakhalin 2 or Sakhalin 3	5 Mt/year	1 line: 2018	China
Gas pipelines					
Power of Siberia	Gazprom-CNPC	Chayandinskoye	38 Bcm	2018	China
Altaï	Gazprom	Gas wells in Western Siberia			

Note (1): Sakhalin already produces 10.8 Mt/year of LNG for export to Asia, particularly to Japan.
Sources: "Russia pays high price for export prize", *Petroleum Economist*, October 2012; "Russia reviews LNG export policy", *International Gas Report*, n° 718, 25 February 2013; IEA (2014*). Russia 2014*. OECD/IEA.

The origins of this market diversification strategy were closely linked to evolutions in Russia's (and its companies) relations with the EU and West as a whole (Gabuev 2015). This was especially the case for natural gas, a sector in which Russia and the EU's relations of interdependency were strong particularly because of the specific nature of transport networks (asset specificity). During the 1990s and 2000s, Gazprom strategy was centred on the objective of maintaining its position as the dominant reliable supplier in the EU market (Locatelli 2008). Gazprom exported 163 Bcm towards the EU in 2013 which made the market of prime importance for the Russian State and essential for Gazprom whose aim there was to

maximize income[4] (in terms of prices and volume). Exports towards this zone have three main functions. The first was to ensure Gazprom's profitability given the low prices of gas internally and barter and non-payment phenomena in the 1990s (Locatelli 2014). The second was to enable stable gas supply for the Russian economy - sales of natural gas to Europe effectively subsidize the supply to Russian consumers through relatively low regulated prices[5]. Finally these exports provide the State with important fiscal income because hydrocarbons were essential variables for the country's budget stability and economic growth.

However growing uncertainty in the EU gas market since the start of the 2000s has led Gazprom to become increasingly concerned that it depends too heavily on this market. Firstly, the drive to maximize income was now called into question by the structural changes within the European market. A low medium-term increase in demand, a more competitive market with new exchange regulations brought about by the EU's liberalization policies plus the impact of *shale gas* have all contributed to the creation of a more uncertain environment for the Russian gas company. These changes would require the EU's traditional suppliers like Gazprom to make important contractual changes to avoid seeing their market share considerably reduced (box 1). Also, the downstream integration strategy implemented by the Russian gas company since the end of the 1990s in response to the liberalization of the European gas market (Locatelli 2008) was threatened by the 3rd EU climate and energy package's clause on third party countries and its *unbundling* rules. Finally the EU and Russia's relationship regarding gas since the start of the 2000s has been hampered by a mutual lack of understanding and by increasing conflicts linked to various transit crises with the Ukraine. This has been worsened by diverging changes in organizational models and more broadly in the gas industries' governance structures (Boussena & Locatelli 2013, see table 5).

Box 1: Gazprom and the liberalization of the European gas market

The EU's traditional suppliers have been forced to redefine the volume/price relationship in their export strategy particularly in long-term contracts such as the *Take or Pay* (TOP) agreements which contractually organize the Russian gas supply to the EU. These contracts guarantee long-term demand which in the eyes of the company was the condition for the development of new production zones given the high level investments required.
However the liberalization of the EU's gas industries has brought about substantial modifications of certain clauses of the TOP contracts which were often questioned because of competition principles (Hautecloque & Glachant 2011; Percebois 2008)[6]. Also the clause to which Gazprom was particularly attached which indexes the prices of gas to the price of oil and other petroleum products has been called into question by changes in the European gas market. While the prices of TOP contracts have kept pace with oil prices, in 2009-2010 the prices of natural gas and LNG sold on the spot markets collapsed because of an overabundance of gas. This led to significant reductions in prices on the spot markets and an important decoupling between the spot prices and the prices for long-term contracts. This change led most European gas companies to ask for their long-term contracts to be revised, particularly those signed with Gazprom[7]. Faced with significant market losses[8], in 2012 the gas

[4] J. Stern (2014) has called Gazprom's behaviour that of the maximizing monopoly.

[5] Changes to the Russian gas market, particularly rising internal prices, have lessened the importance of these two factors. However they remain significant as long as there is a large enough price differential between the markets (Locatelli 2014).

[6] Detailed analysis of discussion on this matter can be found in Locatelli (2013).

[7] Since then debate has increased about the future and point of still indexing gas prices to petroleum products in long-term contracts. An illustration of this is the controversy between S. Komlev, the head of Gazprom's Contract Structuring and Price Formation Directorate and a supporter of gas prices being indexed to the price of

company chose to reduce prices to remain competitive. The prices were reduced in two ways. Firstly, the lowered the price in the baseline price indexing formula[9]. And secondly Gazprom gave certain clients reductions estimated in the literature on the subject as ranging from 10-20%[10]. Consequently, in 2013, the average price of Russian gas was 387 $/ 1000 m^3 (or 10$/ MBTU)[11].
Overall, the new architecture of the gas market as sketched out in the *Gas Target Model* with "Entry-Exist" zones was likely to lead to contractual mismatches in the cases where the supply contracts were on a longer term than transport capacity reservation contracts (Talus 2011; Konoplyanik 2005). This was a particularly tricky matter for Gazprom who would be forced to respond to calls for tender for the reservation of capacities in different Entry-Exit zones (Yafimava 2013) to supply its clients. There would be a risk of multiple *contractual mismatches* thus introducing a specific risk for the EU's external gas supply (Boltz & Konoplyanik 2012 & 2013).

In this rather particular context, exports to Asia were intended to enable Gazprom to compensate for possible revenue losses in the European market and to help the Russian State to compensate for reductions in tax revenue. Of course, given the volumes involved, Asia has yet to prove a credible alternative to Europe but Russian exports to this part of the world were still significant and represent a real departure in Russia's export policy.

- *Natural gas exchanges which respond to competitive requirements*

Energy security preoccupations were essential factors in the development of hydrocarbon exchanges between Russia and China but do not totally override questions linked to the competitivity and profitability of such exchanges. From this point of view, China was looking for gas supply from suppliers with low production costs. Firstly this was to avoid hampering its competitivity, a key factor of its export-led growth accumulation strategy and of its place in the world economy. Secondly it was because the progress of natural gas in the energy balance and its substitution for coal remain uncertain because of low coal prices and a gas supply which was too costly in relation to internal gas prices despite the reforms undertaken (Chen 2014). Conversely, for a long time now Gazprom has considered European prices and indexing natural gas prices to oil and petroleum products as factors which define the reference price for all its exports[12].

Even though there was only incomplete data on the confidential terms of the natural gas contract signed by Gazprom and the CNPC, experts consider its value to give an initial indication of the price of gas exported to China which could thus be around 10$/MBTU (Cornot-Gandolphe 2014, Henderson & Stern 2014). This level of pricing would be likely to satisfy both Chinese and Russian interests (Henderson & Stern, op. cit.) and ensure a sufficient profit level for Gazprom. This pricing level was also similar to the price in

oil, and J. Stern and H. Rogers, two researchers at the Oxford Institute of Energy Studies who are against the idea (Komlev 2013; Stern & Rogers 2013).

[8] In 2012, its gas exports to the EU dropped by 5% while those of Norway increased.

[9] J. Stern (2014). According to this author, there was a 7-10% reduction in the baseline price in the indexing formula. In Henderson & Pirani (2014).

[10] These reductions depend on the differences of prices between long-term contracts and the spot markets. In 2012, the company is said to have paid over 3 billion dollars to various European companies.

[11] "Uncomfortable bedfellows", *Petroleum Economist*, June 2014.

[12] Analysis of these negotiations can be found in J. Henderson (2011) and K. Paik (2012).

Gazprom long-term contracts for supply over the German border. If price modifications in these contracts were taken into account, this price was at 9.15$/MBTU at the start of 2015 and in the case of the CNPC to be roughly as high as the prices of its imports from Central Asia. This means that a competitive balance was maintained between China's different sources of supply (Henderson 2014). Moving on from this, the price of the Russian contract was likely to be used for *benchmarking* other future sources of LNG supply. However one more general remark needs to be made at the point - the drop in oil prices was likely to strongly impact all these prices given the oil price indexing formulas in long-term contracts.

Box 2: Estimation of the price of gas deliveries to China (at entry point on the border), first quarter of 2014

- Average price of gas imports from Turkmenistan: 10.4 $/MBTU.
But J. Henderson (2014) considers that 4.48 $/MBTU should be added in transport costs to Shanghai compared with just 2.50 $/MBTU for Russian gas from the *Power of Siberia.*
- Average price of gas imports from Myanmar (per pipeline): 11.6 $/MBTU
- Estimated price of Russian gas: 10 $/MBTU
- Average price of LNG imports: 12.6 $/MBTU but certain LNG imports from the Middle East or Africa may be as high as 17 to 19 $/MBTU. The price of Qatari gas for example - an important supply for China in terms of volume - was supposed to have been around 17.30$/MBTU on average in 2013.

Sources: "Russia, China sign historic agreement", *International Gas Report*, n° 250, 2 June 2014; "Gas for China", *Energy Economist*, n° 392, June 2014; "China Deal Makes Waves for LNG Shippers", *Petroleum Intelligence Weekly*, 2 June 2014; Henderson (2014); Cornot-Gandolphe (2014).

3. Structures of governance for Russia, China and EU energy exchanges

- *The specific nature of Russia-China hydrocarbon exchanges*

Exchanges between Russia and China exist within a very specific institutional framework which drives strong bilateral relations between the energy companies and between the two countries. These essentially concern long-term contracts between State companies - mainly Rosneft and Gazprom from Russia, and the CNPC for China. These contracts were increasingly backed up with Chinese bank loans (*oil-backed loans*). This rather specific model (first developed in Angola) consists of loans from Chinese banks (particularly the Development bank) to oil-producing countries. They were linked to Chinese investment in the construction of infrastructures or industrial projects. They may also be accompanied by the oil companies gaining access to the producing countries' hydrocarbon resources in the form of asset swaps between oil and gas companies or by investment in the development of wells or deposits (for example the development of the Vankor oil deposit whose licence was held by Rosneft). These were then reimbursed via an oil supply contract with a Chinese oil company (Box 3). This business model has been widely used for oil supply from Russia and could be used with natural gas (particularly for the construction of pipelines).

Box 3: The Chinese policy of loans in return for Russian oil

Example: the 2009 agreement between Rosneft, the Chinese Development bank and the CNPC

In February 2007, the Chinese Development bank signed an agreement with two Russian State companies, Rosneft (oil company) and Transneft (pipeline monopoly) for loans backed with oil exports. The terms of the agreements were as follows. The Chinese bank agreed to loan the Russian firms 25 billion dollars - 15 billion for Rosneft and 10 billion for Transneft. In exchange, the two companies were to deliver 300,000 b/day of oil to the CNPC over a 20-year period (January 2001-December 2030), with 60% (180,000 b/day) to be provided by Rosneft and 40% by Transneft (120,000 b/day bought from Rosneft) via the ESPO (East Siberia Pacific Ocean) oil pipeline. The interest rate involved was the LIBOR (*London Interbank Offered Rate*) plus a profit margin.

The crude oil price was set each month on the basis of the price of the blend at the port of Kozomino. The CNPC makes the payment for the crude oil supplied by Transneft and Rosneft into an account opened at the Chinese development bank which can be debited by the bank to reimburse the loan which has been granted. This type of agreement involves a wide range of participants - banks, oil companies, government - with multiple interests and objectives. Nonetheless it fits with China's strategy aimed at making supply sources secure and Russia's strategy to obtain some financement. The 2007 agreement with China more specifically enabled Transneft to part finance the construction of the ESPO oil pipeline which China sees as a channel for the diversification both of its supply and the routes of supply. On this basis, the Chinese authorities see the pipeline as an important factor in making its oil supply secure.

Estimation of oil Russian deliveries to China backed with loans from the *China Development Bank*

	2010	**2011**	**2012**	**2013**	**2014**
Russia (2013)	Two contracts signed by Rosneft - one with Sinopec and the other with the CNPC				
Russia (2005)	180				
Russia (2009)		300	300	300	300

Source: Downs (2011); Skalamera,(2014).

In 2013, a new agreement was signed with Rosneft who committed to more than double its oil deliveries to China for the next 25 years. In 2018, the volume exchanged should reach 620,000 b/day. In exchange, Russia received an immediate payment of 70 billion dollars (Skalamera 2014). In October, Rosneft signed a new memorandum with Sinopec covering partially pre-paid oil deliveries (Societé Generale, July 23rd 2014).

This institutional model was testimony to China's particular approach to energy security. First it allows the country to at least partly respond to the requirements of its priority strategy regarding securing supply: its access to producer countries' resources (Herberg 2011; Boussena *et al.* 2006). This then leads on to the development of a complex network of mainly bilateral links (Hebert 2015) as well as growing involvement with essential regional institutions like the *Shanghai Cooperation Organization* (SCO), the *Asia-Pacific Cooperation* (APEC) or the *Association of Southeast Asian Countries* (ASEAN), to cite just a few examples. This approach and its underlying thinking have led to the increasing internationalization of State companies.

These exchange modalities do not contradict the three key aims of Russian energy policy - sovereignty over its natural resources, securing oil and gas demand in the medium term given the importance of hydrocarbons for its economic development and international insertion strategy. The latter depends on the performances of its energy sector and functions according to national equilibria and compromises. This state-centric outreach strategy has two main orientations. The first of these involves defining priority economic partnerships by developing long-term contracts in the framework of bilateral "State-to-State" relationships for its gas exchanges. The second aims to promote the internationalization of its companies particularly through downstream integration strategies driven in consumer markets to which Gazprom's policy in the European market during the 2000s and 2010 testifies (Locatelli 2008). From this standpoint, Russian energy companies were capable of running a downstream integration strategy in the Chinese market (Shadrina & Bradshaw 2013). This strategy also provides

Russian companies with extra financing to help them develop a certain number of projects. The convergence of Russian and Chinese energy governance policy derives from a shared interest in state-led energy security management which translates to the international stage through diplomatic initiatives regarding energy and bilateral State-to-State and company-to-company relations (Shadrina 2014b; Vivoda 2014).

- *EU and Russia-China: two different conceptions and ways of managing energy security*

This conception of energy security was in opposition to that of the United States and the European Union whose approach was based on competition-based management of energy security. This involves the liberalization of national energy markets and non-discriminatory access thereto. It needs to be based on the vertical deintegration of network industries, the privatization of energy companies and the creation of competitive markets in which prices were driven by supply and demand. This approach underpins the multilateral market access regulations in the OMC Agreements to which we need to add the similar provisions in both these Agreements and in the Energy Charter regarding non-discriminatory access to international investment.
Consequently, even if the principle of State sovereignty over natural resources was not called into question, the OMC-Energy Charter legislative architecture induces a governance mode aimed at implementing competitition-based and non-discrimatory access to hydrocarbon resources which makes competition and the competitive State the prime energy security regulation institutions.
The EU was trying to internationalize this conception of energy security by exporting the Community *acquis* to its energy partners. The Commission views itself as a "normative power" (Manners, 2002; Laïdi, 2008) or "exporter of norms" (Schimmelfennig, Lavenex, 2010; Finnemore, Sikkink, 19987) and has developed a public policy transfer doctrine which can be applied to the question of energy security[13].
In this framework, the EU considers that its management of the energy security issue – particularly with its external gas suppliers which it depends on for 60% of its supply – necessitates exporting European norms, rules and organizational models. This could be summarized in the term of external energy governance, defined as the normative process of exporting energy related, EU-centred norms by different institutionalized arrangements (Weber, 2014). The rationale behind it is, that energy supply and affordability was best guaranteed by rule of law, interconnected markets grounded in EU norms, which limit the capacity of third parties to pursue politicized energy policies (CIEP, 2004). Three *Legislative Packages were* the instruments of EU energy norms export. They focus on the independent operation of networks, guaranteed and transparent grid access, market-based princing. Their export was supposed to stimulated competition and investment of energy companies in order to guarantee sufficient supply and affordable prices and depoliticize the energy supply chain, thereby contributing to EU supply security (EC, 2008; 2011).

To be more precise, M. Keating (2012) considers that the key objective of the EU's energy security strategy was the transformation of its suppliers' energy governance. This has had

[13] In the absence of a common energy policy because of EU Member States' divergent interests, the Commission has developed an EU energy security foreign policy based on the principle of exterior energy governance inspired by the intra-community norms and rules which also complies with the Commission's internal market abilities and regulations (Youngs, 2009).

important consequences for exchanges, particularly of natural gas, as the conflicts between the EU and Russia since the start of the 2000s demonstrate (cf. point 2). Russia's decision not to ratify the Energy Charter was the expression of the State's refusal to consider the EU's norms and rules for a competitive governance structure as the regulatory framework for natural gas exchanges (Cameron 2010), and more broadly as the tool for energy security management. As T. Romanova points out (2012), the EU's drive to "impose" its competitive paradigm calls into question a fundamental principle of Russian foreign policy namely that of equality between powers. The question of the internationalization of rules/norms defined for a given space and points of convergence between national rules/norms and international rules/norms, particularly when States have different preferences, therefore clearly requires thought (Alter & Meunier 2009). This paradigm also involves uncertainty about the role of the State concerning access to hydrocarbon resources (Boussena & Locatelli 2013).

Table 4: The stakes of energy security: a comparison between the EU, Russia and China

EU	Russia	China
Objective of the energy policy To secure supply by diversification of suppliers	Objective of the energy policy To secure demand by diversification of export markets	Objective of the energy policy To secure supply by diversification of suppliers
Means Competition: short-term transaction Access to resources through a multilateral investment framework Creation of a sole market with producers by export a competitive governance structure International private companies	Means Long-term TOP-type contract and competition between buyers Downstream integration in consumer countries Bilateral State-to-State relations: energy diplomacy International State companies	Means Long-term TOP-type contract and competition between suppliers Access to resources in supplier countries via State companies Bilateral State-to-State relations: energy diplomacy International State companies

Broader questions remain to be answered about the institutional and economic credibility and feasibility of reforms aimed at implementing the EU and the United States' competitive paradigm within the Russian and Chinese hydrocarbon sector. In this context, if we refer to the gas industry, the Chinese and Russian organizational models for industries and governance structures possess certain characteristics which respond to the specific institutional feature of their environments (see table 5). The hypothesis of alignment between a structure of governance and an institutional environment put forward by neo-institutionalist theory (Williamson 2005; Brousseau *et al.* 2011) justifies organizational modes and governance structures in gas industries which were relatively different according to the institutional environments under consideration. It was indeed important to define a form of institutional complementarity between the governance structure, organizational model and institutional environment in hydrocarbon industries. In fact a form of dual institutional complementarity was required - between the institutional matrix and the governance structure on one hand and between the structure of governance and the characteristics of transactions on the other. In this respect, the gas industries - rent and non-renewable resources industries and network industries – were characterised by high specificity of assets which cannot be

redeployed as far as transportation was concerned and were lacking in defined property rights whenever public property rights to land-based resources were maintained.

The gas markets in China and Russia were both what may be called "dual" markets insofar as they were dominated by a hierarchical form of governance with degrees of competition in certain fringe areas of the market. This structure of governance was firstly based on companies with a majority State ownership like Gazprom or Rosneft in Russia and the CNPC, Sinopec for China and which were also vertically integrated. These State companies comply with the specific requirements of Russian and Chinese institutional environments namely low energy prices, uncertainty about property rights and the weakness of contracts and certain market institutions like fiscality. In this respect they position themselves as a complement to and substitute for contractual regulation (Locatelli & Rossiaud 2011). Another central feature of the gas markets was the dual pricing system which combines low regulated prices (particularly for the residential sector or certain industries considered a priority, such as fertilizers in China) and free pricing derived from a certain degree of competition in other market segments. The aim of price reforms in both Russia (Locatelli 2014) and China (Chin 2014) was to gradually make these two pricing systems converge which would consequently noticeably increase internal gas prices. However, these two pricing systems still co-exist in the Russian and Chinese gas markets. In the two countries, the fragmentation of the market with the emergence of more competition-based segments was the way to reform the gas industries and to increase its efficiency (see table 5). But this was in clear opposition to the EU's competitive model intended to replace hierarchical and administrative coordination mechanisms (Glachant & Perez 2007).

Table 5: Organizational models and structure of governance in gas industries: a comparison between EU, Russia, China

EU	Russia	China
Competitive market	Dual market	Dual market
- Vertical de-integration (*unbundling*)	- Vertical integration	- Vertical integration
- Access for third parties to gas pipelines	- Partially implemented access for third parties	- No access for third parties
- Markets spot, hubs for prices	- Regulated prices and free pricing on certain market sectors	- Regulated prices and free pricing on certain market sectors
- International private companies	- State company and some private companies	- State companies
Governance system	Governance system	Governance system
- Moving towards competitive governance	-Hierarchical governance with competitive fringes	-Hierarchical governance with competitive fringes
- *Rule of Law and* Multilateralism	-Bilateralism	-Bilateralism

Sources: Locatelli (2013); Shadrina (2014b)

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The development of hydrocarbon exchanges between Russia and Asia was a long-term strategy albeit with short-term implications. For the moment, these exchanges were a response to economic imperatives in the framework of Russia's export market diversification policy and China's aim to diversify its suppliers. But in the longer term, such exchanges could act as the framework for a future energy governance structure and as such impose an alternative to competition-based energy security management.

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