EIS 11/2017

Preferred Owners of European Gas Storage and Transmission Companies

Submitted 04/2017

Accepted for publication 08/2017

Preferred Owners of European Gas Storage and Transmission Companies

Olga Bogdanova

Riga Technical University, Kalnciema street 6, Riga LV-1007, Latvia, nameolga@yahoo.co.uk

Ilja Arefjevs

BA School of Business and Finance, K.Valdemara 161, Riga, LV1013, Latvia, ilja.arefjevs@inbox.lv

Jurijs Spiridonovs

RISEBA University of Business, Arts and Technology,3 Meža Street, Riga, LV-1048, Latvia
j.spiridonovs@gmail.com

http://dx.doi.org/10.5755/j01.eis.0.11.18247

Abstract

The purpose of the article is to compare actual owners of European gas storage and transmission companies with preferred ones based on experts' assessments from the perspective of the Energy Union dimensions.

Tasks of the research include explaining the topicality of the research, collecting data on owners of European gas storage and transmission companies, grouping companies in accordance with their ownership structures, obtaining expert assessments on preferred owners of the companies, comparing actual owners with preferred ones as well as drawing corresponding conclusions.

Methods used area single linkage cluster analysis, structured expert interviews, analytic hierarchy process, monographic method, document analysis, case study method, literature review and others.

The research covers gas storage and transmission companies in Europe, which are members of the Gas Infrastructure Europe Association. Companies are grouped into clusters according to the shares of the defined types of owners. Experts with sufficient knowledge on five dimensions of the Energy Union were interviewed in order to obtain assessments of preferred owners for the companies subject to research. Expert interview results were processed by using the analytic hierarchy process. At the final stage of the research, actual owners were compared to preferred ones derived from expert assessments and corresponding conclusions drawn.

Six various clusters of gas storage companies and seven ones categorising transmission companies were identified while fifteen companies were defined as outliers. Apart from holdings by states of establishment, which constituted the most of observed cases, in many other instances both other European Union state as well as non- EU state holdings were revealed in the companies subject to research. Expert assessments processed by the analytic hierarchy process revealed the most and the least preferred clusters from the perspective of the five dimensions of the Energy Union.

KEYWORDS: Energy Union, state ownership, gas storage and transmission, expert interviews, energy security.

ktu 1922

European Integration Studies
No. 11 / 2017
pp. 148-159
DOI 10.5755/j01.eis.0.11.18247

Introduction

State ownership is a well-known concept, which can be explained by percentage of shareholdings by government agencies and affiliated state owned entities (Hsueh-Liang, 2007). Ownership unbundling concept is defined as the strictest regulatory regime of vertical disintegration, as the company that owns and operates the transmission assets is fully separated from trade or production (Growitsch, Stronzik, 2014). The natural gas industry in Western Europe has been experiencing drastic changes induced by the unbundling of the state-owned companies, followed by the liberalization of gas market (Pelletier, Wortmann, 2009). The last couple of decades have seen substantial growth in the use of gas for power generation, putting upward pressure on overall gas demand due to switching from CO2 intensive power generations. However, in recent years gas demand has fallen rapidly, peaking in 2010 falling by 28% by 2014 (Eurostat) as a result of weak economic growth, energy efficiency, competition from coal and expansion of renewables generation. There is a large amount of uncertainty around future gas demand in Europe, with substantial falls in annual consumption possible in the long term in some scenarios. In particular, Europe has set further renewables growth and carbon targets beyond 2020. Significant further growth in renewables production, electrification of heat and energy efficiency could put further downward pressure on annual gas demand. Moreover, expectations of the market players in Russia concerning the global perspectives of the gas market continue to decline (Deloitte, 2016).

The study by Roland Berger Strategy (2014) regarding grid infrastructure development efforts have been made throughout Europe to develop and integrate the power transmission networks in order to provide a safe, reliable, sustainable and affordable supply of energy to citizens in Europe, as this is of major importance for the well-being and quality of life of people in Europe. A range of issues still remains nebulous, so the right balance should be found between such aspects of energy policy, as, for example, regional and national sovereignty, energy supply security and cost affordability, as well as other horns of dilemma (Spiridonovs, Bogdanova 2016). On the other hand the European-wide support for the concept of an Energy Union offers the opportunity to develop and implement a shared European vision, which is required to address the common challenges on secure, competitive and sustainable energy supply (Szulecki, Ancygier, Neuhoff, 2015).

Tasks of the research include explaining the topicality of the research, defining the five dimensions of the Energy Union as a response to the energy challenges in Europe, collecting data on owners of European gas storage and transmission companies subject to research, grouping companies in accordance with their ownership structures, obtaining expert assessments on preferred owners of the companies, comparing actual owners with preferred ones as well as drawing corresponding conclusions. Additionally it is also connected with the new structure of global energy market, e.g. from 2004 to 2013, the 202 location choices have been found by 132 Chinese firms targeting investments in 17 EU countries, sector of renewable energy (Ping, Spigarelli 2016).

Methods used area single linkage cluster analysis, structured expert interviews, analytic hierarchy process, monographic method, document analysis, case study method, literature review and others. The research covers gas storage and transmission companies in Europe, which are members of the Gas Infrastructure Europe Association, being an assembly point for companies responsible for nearly 84% of gas operations in the region. State ownership is defined from the perspective of control of a state via direct and indirect holdings such as municipalities, its companies as well as sovereign funds belonging to a state. Ownership structures are categorized by using four types of possible owners of companies covered by the research: state of establishment, other EU state, non- EU state as well as private (i.e. non-state) ownership. Companies are grouped into clusters according to the shares of the defined types of owners. Experts with sufficient knowledge on five dimensions of the Energy Union (i.e. energy security, solidarity, trust;

internal market; moderation of demand; decarbonisation; research, innovation, competitiveness) were interviewed in order to obtain assessments of preferred owners for the companies subject to research. Expert interview results were processed by using the analytic hierarchy process, which provided quantitative assessments for the defined types of owners.

Energy Union Perspective

EU Energy Union creation process may be theoretically linked with the energy geoeconomics. Energy geoeconomics makes use of energy resources as an instrument to advance political aims that are not energy-related—by manipulating another actor's need for affordable and secure energy supplies with one's own energy resources (Wiggel, Vihma 2016). Comparing the energy policy of 1970s and 2000s, the remarkable transformation of the energy policy accents could be noticed. Until recently, the only truly global energy market was oil, whereas all others, including electric power and gas, remained national or at best regional (Kuzminov, *et. al.*, 2017). The main initiatives of the EU were driven either by the EU internal market idea or by environment protection perspective. However, the coherent common energy policy still was rather illusive (McGowan, 2011). The EU institutions have been slow, and sometimes inconsistent and divided on the use of existing powerful instruments – anti-monopoly and "unbundling" legislation – vis-á-vis Russian attempts to dominate the EU gas market (Bošnjaković, 2016). After discussions between the European Commission, the EU member states, politicians, non-governmental organizations, academia representatives and other parties, a new era in the EU energy policy started (European Commission, 2010). In 2015, during the Latvian presidency the revolutionary strategy of the EU Energy Union was launched with an aim to turn energy to the one of the EU freedoms. The strategy is based on the five key pillars (dimensions):

1. Energy security, solidarity, trust;
2. Internal market; moderation of demand;
3. Decarbonisation;
4. Energy efficiency;
5. Research, innovation, competitiveness.

The strategy (European Commission, 2015) changes the ideology of energy systems from traditional country-oriented and self-sufficient only to the region-oriented integrated systems. However, to be credible, narrative [on the Energy Union] would have to be in line with communications and decisions on other levels (national and regional) and other policy areas that are affected as, e.g., job market, technology and innovation policies or fiscal policies. This might be facilitated when a great proportion of stakeholders and policymakers from different levels and domains are informed, able to participate, and agree to the process and accept its result (Ellenbeck, *et. al.*, 2015).

The Energy Union debates have uncovered several policy cleavages. The major one is Europeanisation versus maintaining sovereignty of Member States in the energy sector. Another is pitching security and affordability against sustainability in the notion of 'rehabilitating' fossil fuels versus enhancing renewable deployment (Szulecki, *et. al.,* 2016). European energy security, climate change mitigation and increased competitiveness should not only be attained by internal EU energy savings measures. These objectives also depend on the reorientation of the economies in EU partner countries towards more energy efficient patterns (Boute, 2013). With member states anchored to their individual national energy policies and with many obstacles for cooperation on an intergovernmental level, the integration goal can be achieved only through advanced supranational cooperation (Focken, 2015). Member State governments still have a central position and policy issues where power is transferred to the EU level tend to be those where Member States see such transfers as in their interest (Wettestad, *et. al.,* 2012).

The EU Energy Union strategy as a policy document is being practically incorporated into the legal acts in form of concrete regulations and directives, as well as delegated legal acts, which are to be further either applied directly or transposed into the national legal systems of the EU

Member States. Consequently, the possibility to hit the target of the Energy Union strategy without missing the point depends directly on the quality of the transposition of the concrete requirements set in the Energy Union-related legal acts.

In practice, it means that all the stakeholders involved in the regulatory settlement chain, namely, governments and the energy ministries defining primary and secondary legislation, Public Utilities Commissions approving tariff methodologies and system access rules, transmission system operators, storage system operators (if available) and distribution system operators elaborating their systems' usage rules and proposing tariff plans, play an important role for the final outcome of all the process.

Even though all the mentioned stakeholders have strictly defined competence and field of their responsibility, some of the elements of the Energy Union might be less attractive from their egoistic short-term perspective. For example, a transmission system operator might be not interested in developing additional elements of a system, which on the one hand increases a security of supply, but on the other hand decreases the load of the existing infrastructure consequently decreasing income from power transported by one unit of infrastructure. At the same time, the transmission system operators, which are too focused on security of energy supply might be not open enough to promote innovations and develop new market-oriented services to market participants.

The analysis performed by the authors aims to identify interrelations between the owners of energy undertakings of the European Union (gas transmission operator and gas storage operators) and the overall fitness of the undertaking to meet particular aims of the dimensions of the Energy Union strategy. At the final stage of the research actual ownership structures are compared to preferred ones derived from expert assessments and corresponding conclusions drawn. The article constitutes scientific novelty primarily because it assesses different types of owners of gas storage and transmission companies according to the Energy Union dimensions, which are not yet studied enough since the Energy Union was introduced only in 2015, after the European gas market was liberalised.

Owners of Gas Storage Companies

Following thirty one member of the Gas Infrastructure Europe Association (i.e. Storage section) was included in the research (further abbreviation is stated in brackets while its two last letters define a country of operations): *astora GmbH & Co. KG* (Astora DE), *Bulgartransgaz EAD* (Bulgartransgaz BG), *Centrica Storage Limited* (CSL UK), *Edison Stoccaggio S.p.A.* (ES IT), *Enagás S.A.* (Enagas ES), *Energinet.dk* (Energinet DK), *N.V. EnergyStock* (NVES NL), *Fluxys Belgium S.A.* (Fluxys BE), *GAZPROM Germania GmbH* (Gazprom DE), *Magyar Földgáztároló Zrt.* (Magyar HU), *MMBF Földgáztároló Zártkörűen Működő Részvénytársaság* (MMBF HU), *NAFTA a.s.* (NAFTA SK), *Nederlandse Aardolie Maatschappij B.V.* (NAM NL), *OMV Gas Storage GmbH* (OMV AT), *Operator Systemu Magazynowania Sp. z o.o.* (OSM PL), *POZAGAS a.s.* (Pozagas SK), *Podzemno skladište plina d.o.o.* (PSP HR), *RAG Energy Storage GmbH* RAG AT, *REN Armazenagem S.A.* (REN PT), *RWE Gasspeicher GmbH* (RWE GG DE), *RWE Gas Storage, s.r.o.* (RWE GS CZ), *Stogit S.p.A.* (Stogit IT), *SSE Hornsea Ltd* (SSE H UK), *Storengy S.A.*(Storengy FR), *Storengy Deutschland Leine GmbH* (SDL DE), *Swedegas AB* (Swedegas SE), *TAQA Energy B.V.* (TAQA E NL), *Transport et Infrastructures Gaz France, S.A.* (TIGF FR), *Uniper Energy Storage* (UES DE), *VNG Gasspeicher GmbH* (VNG G DE*), Hellenic Gas Transmission System Operator S.A.* (HGTSO GR). In accordance with the research methodology, each gas storage company was assessed from the perspective of its shareholders paying special attention to direct and indirect state control via ownership in share capital of such companies. Share of ownership by state of establishment, another state or states of the European Union and ownership by non-EU state or states served as segregation criteria for the cluster analysis by the single linkage method. The cluster analysis summary is presented in the Table 3. There were six clusters identified in total as well as nine gas storage companies classified as outliers, i.e. not fitting into any of the defined clusters.

Table 1
Cluster analysis of owners of gas storage companies in Europe, 2016

Cluster	Owners			
	State of establishment	Other EU state	Non-EU state	Private
1	0%	42-50%	0%	50-58%
	SDL DE, Swedegas SE			
2	0	0%	41-50%	50-59%
	Gazprom DE, REN PT			
3	100%	0%	0%	0%
	Bulgartransgaz BG, Energinet DK, NVES NL, Magyar HU, MMBF HU, PSP HR, VNG G DE			
4	72-84%	0%	0%	16-28%
	Fluxys BE, OSM PL, HGTSO GR			
5	0-15%	0%	0%	85-100%
	CSL UK, Enagas ES, NAM NL, RWE GG DE, SSE H UK, UES DE			
6	28-29%	0-10%	0%	62-71%
	NAFTA SK, Pozagas SK			
Outliers	0-50%	0-85%	0-76%	15-85%
	Astora DE, ES IT, OMV AT, RAG AT, RWE GS CZ, Stogit IT, Storengy FR, TAQA E NL, TIGF FR			

Source: prepared by authors.

The first cluster of companies reveals substantial (i.e. 42-50%) ownership of other EU states-SDL DE is partly owned by France and the state consortium with the EU origin, Swedegas SE is partly owned by Belgium and to a very minor extent by Spain. None state of establishment and non-EU state ownership was discovered for the cluster companies. The second cluster companies Gazprom DE and REN PT have substantial non-EU state ownership (41-50%) and zero state of establishment and European economic area state shareholders. In case of REN PT this is State Grid of China and Oman Oil (i.e. Oman state based company). Gazprom DE is controlled by the Russian Government to the extent of 50%. The cluster number three is the most monolith due to an absolute 100% stake of the state of establishment in share capital of the gas transmission companies included in the cluster. The cluster consists of Bulgartransgaz BG, Energinet DK, NVES NL, Magyar HU, MMBF HU, PSP HR, VNG G DE. The cluster is followed by the next one, which is nearly similar in terms of state of establishment ownership, which varies from 72% to 84% leaving at nearly 0% holdings of other states. The cluster number five (i.e. CSL UK, Enagas ES, NAM NL, RWE GG DE, SSE H UK, UES DE) represents the most liberalised companies whereas state of establishment holdings range from 0 to 15% and no other state holdings were revealed. The cluster number six can be considered to be somewhat less liberalised than the previous one, even though state of establishment holdings vary from 28 to 29% while other EU states might have ownership to the extent up to 10%, which is very low. However, it should be noted that the cluster consists of two Slovak companies and thus is not that representative. Outlier companies were not included in any of the clusters because of significantly different ownership structure, which is summarised in the Table 2.

German based Astora DE to the extent of 25% can be considered to be controlled by the Russian Government via its Gazprom stake (i.e. 50%). No other state holdings were identified for the

Table 2
Owners of gas storage companies (outliers) in Europe, 2016

Company	State	Other EU state	Non-EU state	Private
Astora DE	0%	0%	25%	75%
ES IT	0%	85%	0%	16%
OMV AT	32%	0%	25%	44%
RAG AT	44%	15%	0%	41%
RWE GS CZ	0%	15%	0%	85%
Stogit IT	23%	0%	10%	67%
Storengy FR	50%	0%	0%	50%
TAQA E NL	0%	0%	76%	24%
TIGF FR	17%	8%	40%	35%

Source: prepared by authors.

company. Italian ES IT (i.e. Edison Stoccaggio S.p.A.) is owned by the Government of France to the extent of 85% via EDF holding, which makes it distinctive from other companies. OMV AT is partly owned by the state of Abu Dhabi (24.9%) while 32% belongs to local authorities. Stogit IT has quite a similar structure with 23% controlled by state of establishment and 10% owned by a non-EU investor- State Grid of China. One of the most interesting companies is TAQA E NL, which is owned by Abu-Dhabi state to the extent of 76% while no other state holdings were present. France based TIG FR is also owned by non-EU investors to a bigger extent compared to state of establishment and EU state ownership. Non EU investors' stake in the company reaches 40% (i.e. mainly Singapore GIC and State Grid of China).

Owners of Gas Transmission Companies

Following thirty one member (including two observers) of the Gas Infrastructure Europe Association (i.e. Tansmission section) was included in the research (further abbreviation is stated in brackets while its two last letters define a country of operations): *Bulgartransgaz EAD* (Bulgartransgaz BG), *Creos Luxembourg S.A.* (Creos LU), *Hellenic Gas Transmission System Operator S.A.* (HGTSO GR), *Enagás S.A.* (Enagas ES), *Energinet.dk* (Energinet DK), *Eustream, a.s.* (Eustream SK), *Földgázszállító Zrt.* (Földgázszállító HU), *Fluxys Belgium S.A.* (Fluxys BE), *GASCADE Gastransport GmbH* (GASCADE DE), *Gas Connect Austria GmbH* (GCA AT), *Gas Networks Ireland* (GNI IE), *Gassco AS* (Gassco NO), *Gasunie Transport Services B.V.* (GTS NL), *Gasum Oy* (Gasum FI), *Operator Gazociągów Przesyłowych GAZ-SYSTEM S.A* (OGPG-S PL), *GRTgaz S.A.* (GRTgaz FR), *GRTgaz Deutschland GmbH* (GRTgaz DE), *Interconnector (UK) Limited* (Interconnector UK), *National Grid Gas plc* (NGG UK), *NET4GAS, s.r.o.* (NET4GAS CZ), *Ontras Gastransport GmbH* (OSG DE), *Open Grid Europe GmbH* (OGE DE), *PLINACRO d.o.o.* (Plinacro HR), *Plinovodi d.o.o.* (Plinovodi SI), *Regasificadora del Noroeste, S.A.* (RDN ES), *REN Gasodutos S.A.* (REN G PT), *Snam Rete Gas S.p.A.* (SRG IT), *Swedegas AB* (Swedegas SE), *Swissgas AG* (Swissgas CH), *Trans Austria Gasleitung GmbH* (TAG AT), *Transport et Infrastructures Gaz France, S.A.* (TIG FR).

Furthermore, each gas transmission company was assessed from the perspective of its shareholders paying special attention to direct and indirect state control via ownership in share capital of such companies. Share of ownership by a state of establishment, another state or states of the European Union and ownership by non-European Union state or states served as segregation criteria for the cluster analysis by the single linkage method. The cluster analysis summary is presented in the Table 3. There were seven clusters identified in total as well as six gas transmission companies classified as outliers, i.e. not fitting into any of the defined clusters.

Table 3
Cluster analysis of owners of gas transmission companies in Europe, 2016

Cluster	Owners			
	State of establishment	Other EU state	Non-EU state	Private
1	0%	33-50%	0%	50-67%
	GRTgaz DE, Swedegas SE, TAG AT, GRTgaz DE, Swedegas SE, TAG AS			
2	23-24%	0%	10%	66-67%
	RDN ES, SRG IT			
3	0-5%	0%	0%	95-100%
	Enagas ES, NGG UK, NET4GAS CZ			
4	47-51%	0%	0%	49-53%
	GRTgaz FR, Plinovodi SI, Eustream SK			
5	100%	0%	0%	0%
	Bulgartransgaz BG, Energinet DK, GNI IE, Gassco NO, GTS NL, Gasum FI, OGPG-S PL, Swissgas CH, OSG DE, Plinacro HR,			
6	77-84%	0-1%	0%	16-22%
	Creos LU, HGTSO GR, Fluxys BE			
7	0%	0%	25%	75%
	GASCADE DE, OGE DE			
Outliers	0-32%	0-80%	0-40%	20-75%
	Földgázszállító HU, GCA AT, Interconnector UK, REN G PT, TIG FR			

Source: prepared by authors.

The first cluster of companies reveals moderate ownership of other EU states- GRTgaz DE is partly owned by France and the state consortium with the EU origin, Swedegas SE is partly owned by Belgium and to a very minor extent by Spain while TAG AS is partly owned by Italy and Austria. None state of establishment and non-European economic area state ownership was discovered for the cluster companies. The second cluster companies RDN ES and SRG IT have moderate state of establishment ownership (23-24%) and low non-European economic area state shareholders. In case of RDN ES this is an Algerian state company while SRG IT is partly owned by the State Grid of China. The third cluster of gas transmission companies can be considered to be the most liberalised. Only Spain based Enagas ES has a state of establishment stake of 5% while no other state holdings were identified. In other companies of the cluster state holdings were found to be non-existent. The cluster number four demonstrates substantial ownership of state of establishment, which ranges from 47% to 51% whereas other state holdings were not revealed. The next cluster number five is the most monolith due to an absolute 100% stake by a state of establishment in share capital of the gas transmission companies included in the cluster. The cluster is followed by the next one, which is nearly similar in terms of state of establishment ownership, which varies from 77% to 84% leaving at nearly 0% holdings of other states. The cluster number seven constitutes high scientific interest because only non-European economic area states have stakes in the companies. In particular, GASCADE DE is partly owned by Gazprom (around 50% controlled by the Russian Federation) while 24.9% of shares of OGE

DE belongs to the Abu Dhabi state-based holding Infinity Investments. Outlier companies were not included in any of the clusters because of significantly different ownership structure, which is summarised in the Table 4.

Table 4
Owners of gas transmission companies (outliers) in Europe, 2016

Company	State	Other EU state	Non-EU state	Private
Földgázszállító HU	25%	0%	0%	75%
GCA AS	32%	0%	25%	44%
Interconnector UK	0%	80%	0%	20%
REN G PT	0%	0%	40%	60%
TIG FR	17%	8%	40%	35%

Source: prepared by authors.

The Hungarian company Földgázszállító HU is the simplest to interpret because it is owned by state of establishment to the extent of 25% while no other state holdings were identified. GSA AS has nearly balanced stakes of a state of establishment versus non –European economic area state investments via International Petroleum Investment Company, Abu Dhabi. Interconnector UK has a majority investment by Belgium via Fluxys. The Portugal operator REN G PT to the extent of 40% is owned by State grid of China (i.e. with a share of 25%) and Oman Oil (i.e. remaining 15%). TIG FR is owned by Singapore GIC (i.e. sovereign fund of Singapore) to the extent of 35% while another 5% belongs to the State Grid of China.

Expert Assessment of Preferred Owners of Gas Storage and Transmission Companies

In order to assess state and non-state ownership of the companies, authors conducted expert interviews and used the analytic hierarchy process for processing answers. It is considered to be a common tool for structured decision making. Decision making, for which we gather most of our information, has become a mathematical science today (Figuera, *et. al.*, 2005). Decision making involves many criteria and subcriteria used to rank the alternatives of a decision (Saaty, 2008). Data are collected from experts or decision-makers corresponding to the hierarchic structure, in the pairwise comparison of alternatives on a qualitative scale as described below. In total, eight experts were selected within the research (see Table 5).

Choice of experts was balanced in terms of countries of their origin and their occupation. In particular, there are two ex-ministers of Economy, two chief executives of regional energy companies and four other energy related public institution officers. All of them were considered to possess sufficient knowledge on the Energy Union dimensions.

In the course of the analytic hierarchy process, experts can rate the comparison as equal, marginally strong, strong, very strong, and extremely strong. A set of pairwise comparison matrices was constructed in accordance with the overall hierarchy of the process. The hierarchy of the alternatives for preferred owners of gas storage and transmission companies is presented under the Figure 1.

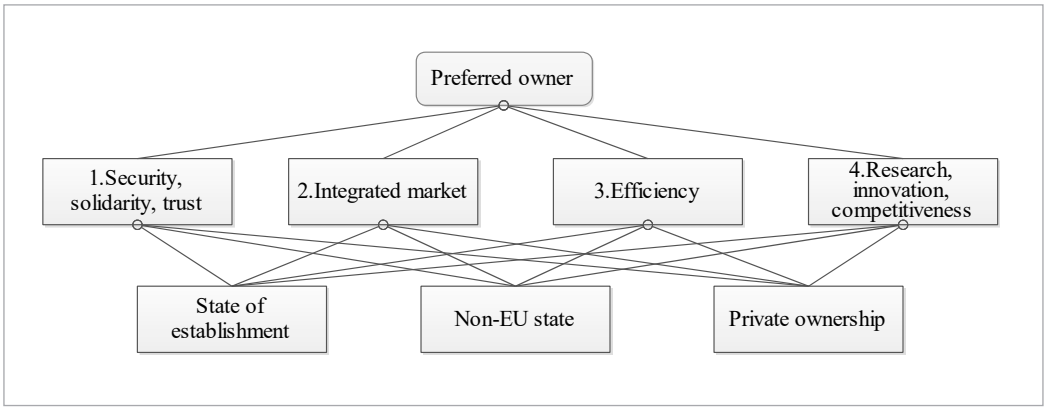
Decarbonisation as one of the Energy Union dimensions was excluded from the evaluation criteria because of potentially controversial impact varying from country to country due to differences in national energy policies (e.g. dominance of fossil fuel in one country vs substantial share of renewable energy in another), leading to different policy needs and developments. Additionally, another EU state as an owner was not assessed for the same reason of potential controversies, which may vary from country to country.

Table 5
Selected experts with knowledge on Energy Union dimensions

Expert	Organisation	Position	Country
Mr. Nemunas Biknius	EPSO-G UAB	Head of Strategy and Development	Lithuania
Mr. Māris Kuņickis	Latvenergo SJSC	Chief Operating Officer	Latvia
Mr. Jaroslav Neverovic	Ministry of Energy	Minister (2012-2014)	Lithuania
Ms. Milda Parnavaite	National Commission for the Energy Control and Prices	Head, Natural Gas Division	Lithuania
Mr. Timo Partanen	Energy Authority	Leading Specialist	Finland
Ms. Dana Reizniece-Ozola	Ministry of Economics	Minister (2014-2016)	Latvia
Mr. Timo Tatar	Ministry of Economic Affairs and Communications	Director, Energy Department	Estonia
Ms. Marija Zjurikova	Permanent Representation of the Republic of Latvia in EU	Counsellor for the Energy Policy	Latvia/ Belgium

Source: prepared by authors.

Figure 1
The hierarchy of alternatives for preferred owners of gas storage and transmission companies according to AHP (prepared by authors)



The expert assessment results according to the AHP process findings were processed by the authors while its summary is presented in the Table 6.

Table 6
Expert assessment results

Alternative/Criterion	C1. Security, solidarity, trust	C2. Integrated market	C3. Energy Efficiency	C4. Research, innovation, competitiveness	Total
A1. State of establishment	0.62	0.55	0.37	0.44	0.49
A2. Non- EU state	0.14	0.14	0.18	0.11	0.14
A3. Private owner	0.25	0.31	0.46	0.46	0.37
Total	1.00	1.00	1.00	1.00	1.00

Source: prepared by authors.

Theoretical preferences of experts clearly tend to exhibit overall anchoring towards ownership by a state of establishment, which is the most frequent type of ownership in practice as well. However, it is noteworthy that while a state of establishment proved to be an extreme preference from the security, solidarity, trust and an integrated market point of view, in case of research, innovation and competitiveness experts assessments are narrowly spread between a state of establishment and a private owner with a tiny overweight towards a private owner. The difference between preferences for a state of establishment and a private owner from the efficiency angle is somewhat more significant, amounting to nine basis points in favour of a private owner. Finally, a non-EU state as an energy undertaking owner got lowest expert assessments in each dimension of the Energy Union included in the research. This is a very important implication, which is suggested to be subject for further research in the area.

Though one expert admitted that a non-European Union country should not necessarily mean countries, which already own partly gas storage and transmission companies such as China, Oman, Abu-Dhabi and other, it needs to be taken into account that liberalised and developed countries such as the United States, Canada or Australia are unlikely to become owners of the European infrastructure via their state holdings.

As a final remark it has to be noted that several experts expressed a view that in case energy regulations are properly designed and implemented, an owner's issue clearly becomes less important from the Energy Union perspective. However, the scope of the current research does not include assessment of effectiveness of national regulations in energy matters.

Conclusions

- Actual ownership by the state of establishment (including both 100% ownership and majority ownership to the extent of over 70%) was found to be the most common for European gas storage and transmission companies comprising nearly 40% of the total sample. Second most frequent types of ownership was with a private owner controlling around 50% of shares while the rest was split between a state of establishment and possible other states of the European Union. Even though being currently rather an exception, there are gas storage and transmission companies owned to the extent up to 75% by non-European Union states. Typically, such states include China, Singapore, Abu-Dhabi and others.
- Overall expert assessments of preferred owners gas storage and transmission companies from the Energy Union perspective generally confirmed the choice of the state of establishment as the primary one and private owner as the second best option. State of establishment got high assessments in the dimension of security and integrated market while private owner obtained strong scores for the efficiency. The dimension of research, innovation and competitiveness was nearly equally rated by experts with a tiny overweight towards a private owner.
- Non-European Union state got the lowest expert assessments in any of the four chosen dimensions of the Energy Union, which can serve as a sound proposal for further research. It has to be taken into account that liberalised and developed countries such as the United States, Canada or Australia are unlikely to become owners of the European infrastructure via their state holdings.
- Actual ownership of European gas storage and transmission companies overall corresponds to preferred owners as assessed by experts. Companies owned to a larger extent by a state of establishment would typically get more points than companies owned largely by private owners. In total, companies owned by states of establishment as well as companies with private owners accounting for at least 50% of shares amount to around 70% of the total sample. Companies partly owned by non-EU states would get the lowest assessment and rather constitute exceptional cases.

References

Bošnjaković, B. (2016). Europe between Climate and Energy Insecurity: Geopolitical Aspects. Annals of Maritime Studies / Pomorski Zbornik. Special Issue, 29-62.

Boute, A. (2013). Energy Efficiency as a New Paradigm of the European External Energy Policy: The Case of the EU–Russian Energy Dialogue. Europe-Asia Studies, 65(6), 1021–1054. https://doi.org/10.1080/09668136.2013.797659

Deloitte (2016). A survey of CEOs and specialists of the oil and gas sector. Retrieved from: [www2.deloitte.com/content/dam/Deloitte/ru/Documents/energy-resources/Russian/ru_2016_oil_and_gas_survey_rus.pdf] (accessed 9 May 2017).

Effective Provisions for Emergency Prevention and Response in the Gas Sector. German Institute for International and Security Affairs, Comment 21/2009.

Ellenbeck, S. et al. (2015). Security of Supply in European Electricity Markets—Determinants of Investment Decisions and the European Energy Union, Energies, 8, issue 6. https://doi.org/10.3390/en8065198

European Commission. (2010). A strategy for smart, sustainable and inclusive growth. COM(2010)2020.

European Commission. (2015). Communication From the Commission to the European Parliament, the Council, the European Economic And Social Committee, the Committee Of The Regions and the European Investment Bank. A Framework Strategy for a Resilient Energy Union with a Forward-Looking Climate Change Policy (COM/2015/080 final).

Figuera, J., Greco, S., Ehrgott, M. (Eds). (2005), Multiple Criteria Decision Analysis, State of the Art Surveys, Springer, New York. https://doi.org/10.1007/b100605

Focken, H. (2015). Between National Interests and the Greater Good: Struggling towards a Common European Union Energy Policy in the Context of Climate Change. Journal of International Affairs, 69(1), 179-191. Retrieved from https://www.questia.com/library.

Frontier Economics Ltd (2016). The environment for gas network investment in Europe, A Report Prepared for GTE Investment Climate WG, January 2016.

Geden O., Graetz J. (2014). The EU's Policy to Secure Gas Supplies. Swiss Federal Institute of Technology (ETH) Zurich, CSS Analyses 159.

Growitsch, C., Stronzik, M. (2014). Ownership unbundling of natural gas transmission networks: empirical evidence. Journal of Regulatory Economics, 46(2), 207-225. https://doi.org/10.1007/s11149-014-9252-0

Hsueh-Liang, Wu. (2007). Exploring the sources of privatization-induced performance changes. Journal of Organizational Change Management, 2007(1), 44-59.

Kuzminov, I., Bereznoy, A., Bakhtin, P. (2017). Global energy challenges and the national economy: stress scenarios for Russia, Foresight, 19 (2), 174-197. https://doi.org/10.1108/FS-06-2016-0026

McGowan, F. (2011). Putting Energy Insecurity into Historical Context: European Responses to the Energy Crises of the 1970s and 2000s. Geopolitics, 16, 486-511. https://doi.org/10.1080/14650045.2011.520857

Pelletier, C., Wortmann, J. C. (2009). A risk analysis for gas transport network planning expansion under regulatory uncertainty in Western Europe. Energy Policy, 37(2), 721-732. https://doi.org/10.1016/j.enpol.2008.08.033

Ping, Lv, Spigarelli, F. (2016). The determinants of location choice: Chinese foreign direct investments in the European renewable energy sector, International Journal of Emerging Markets, 11 (3), 333-356. https://doi.org/10.1108/IJOEM-09-2014-0137

Roland Berger Strategy (2014). Study regarding grid infrastructure development: European strategy for raising public acceptance. Revised Final Report. Retrieved from [https://ec.europa.eu/energy/sites/ener/files/documents/20140618_grid_toolkit_report.pdf] (accessed on 9 May 2017).

Saaty, T.L. (2008), Decision making with the analytic hierarchy process. International Journal Services Sciences, 1(1), 83–98. https://doi.org/10.1504/IJSSCI.2008.017590

Spiridonovs, J., Bogdanova, O. (2016). The resilient Energy Union – response to the challenges of XXI century. 21st International Scientific Conference. Smart and Efficient Economy: Preparation for the Future Innovative Economy, Proceeding of Selected Papers, ISBN 978-80-214-5413-2

Szulecki, K., Ancygier, A. and Neuhoff, K. (2015). Energy Union: From Idea to Reality, EconStor Conference Papers, ZBW - German National Library of Economics

Szulecki, K., Fischer, S., Gullberg, A. T., Sartor, O. (2016). Shaping the 'Energy Union': between na-

tional positions and governance innovation in EU energy and climate policy. Taylor & Francis. https://doi.org/10.1080/14693062.2015.1135100

Wettestad, J., Eikeland, P. O., Nilsson, M. (2012). EU climate and energy policy: A hesitant supranational turn. Global Environmental Politics, 12(2), 67-86. Massachusetts Institute of Technology. https://doi.org/10.1162/GLEP_a_00109

Wiggel, M., Vihma, A. (2016). Geopolitics versus geo-economics: the case of Russia's geostrategy and its effects on the EU. International Affairs. 92(3), 605-627. https://doi.org/10.1111/1468-2346.12600

About the authors

BOGDANOVA OLGA

Dr. oec

Riga Technical University

Fields of research interests

Energy policy, economics, governance

Address

Kalnciema street 6
Riga LV-1007, Latvia
Tel. +37128319554

AREFJEVS ILJA

Dr. sc. administr.

BA School of Business of Finance

Fields of research interests

Finance, investments

Address

K.Valdemara 161, Riga
LV-1013, Latvia,
Tel. +37126547036

SPIRIDONOVS JURIJS

Dr. oec

RISEBA University of Business, Arts and Technology

Fields of research interests

Public services, economic development, energy sector

Address

3 Meža Street
Riga, LV-1048, Latvia
Tel. +37129234414