



REPORT

STEPPING ON THE GAS

FUTURE-PROOFING ESTONIA'S ENERGY MARKET AND SECURITY

| ANDREI BELYI |

MAY 2019

RKK
ICDS

RAHVUSVAHELINE KAITSEUURINGUTE KESKUS
INTERNATIONAL CENTRE FOR DEFENCE AND SECURITY
EESTI • ESTONIA

Title: Stepping on the Gas: Future-Proofing Estonia's Energy Market and Security

Author: Belyi, Andrei

Publication date: May 2019

Category: Report

Cover page photo: A liquefied natural gas (LNG) tanker is tugged towards a thermal power station in Futtsu, east of Tokyo, Japan November 13, 2017. REUTERS/Issei Kato

Keywords: natural gas, LNG, gas infrastructure, energy market, geopolitics, energy security

Disclaimer: This report was supported by a research grant provided by Alexela Group OÜ. The views and opinions contained in this paper are those of its author only and do not necessarily represent the official policy or position of the International Centre for Defence and Security, Alexela Group OÜ, or any other organisation.

ISSN 2228-0529

ISBN 978-9949-7331-7-0 (print)

ISBN 978-9949-7331-8-7 (pdf)

©International Centre for Defence and Security
63/4 Narva Rd., 10152 Tallinn, Estonia
info@icds.ee, www.icds.ee

ABOUT THE AUTHOR

ANDREI V. BELYI

Andrei V. Belyi is an Adjunct Professor at the Centre for Climate Change, Energy and Environmental Law of the University of Eastern Finland (UEF). At UEF, he participated in a research project for the Academy of Finland about the implications of US LNG exports for EU energy law and policy. Before joining UEF, he was based at the University of Tartu (2012-2015) where he co-directed EU-funded Jean Monnet modules on EU energy and climate policies. Prior to that, he acted as a Deputy Head of Department on Energy and Commodity Markets at the Higher School of Economics in Moscow (2006-2012), worked for the Energy Charter Secretariat (2005) and provided consultancy services for MVV Consulting GmbH in Brussels (2000-2004).

During his almost twenty years of professional experience, Andrei Belyi has published widely, including articles and books on gas and LNG markets, energy geopolitics and EU energy policy. He regularly gives interviews to Natural Gas World, Knect365Energy and other specialised portals. Andrei Belyi is a member of the Editorial Board of the Journal of World Energy Law and Business (Oxford University Press), and a member of Brussels Energy Club.

Since 2015 he has provided consultancy services through his own company Balesene OÜ, registered in Tallinn, Estonia (<https://balesene.com/>). Balesene's consultancy services cover policy advice on energy and LNG market analysis. The company is also involved in various innovation projects in relation to the various energy sectors.

LIST OF ABBREVIATIONS

ACER	Agency for the Cooperation of Energy Regulators
bcm	Billion cubic metre
CNG	Compressed natural gas
ECT	Energy Charter Treaty
EU	European Union
ENTSOG	European Network of Transmission System Operators for Gas
FSRU	Floating Storage and Regasification Unit
GATT	General Agreement on Tariffs and Trade
GIE	Gas Infrastructure Europe
GWh	Gigawatt hour
ICDS	International Centre for Defence and Security
IEA	International Energy Agency
IGU	International Gas Union
LNG	Liquefied natural gas
mmbtu	Million British thermal units
MWh	Megawatt hour
MFN	Most favoured nation
NBP	National Balance Point
TEN-e	Trans-European Networks (energy)
TPA	Third party access
TSO	Transmission System Operator
TTF	Title Transfer Facility
TWh	Terawatt hour
WTO	World Trade Organization
WTP	Willingness to pay
UGS	Underground gas storage

TABLE OF CONTENTS

List of Figures and Tables	V
Executive Summary	VI
Introduction	1
1. Focus on Gas Markets	2
1.1. Why Markets are Needed: from Gas Hubs to Energy Security	2
1.1.1. Designing Gas Hubs	4
1.1.2. Entry-Exit Zones: Different Entries, Flexible Supply	5
1.1.3. Flexibility Leads to Security	7
1.1.4. Challenge: to Reconcile Divergent Objectives	7
1.2. Baltic Gas Infrastructures and the Newly Formed Entry-Exit Zone	8
1.2.1. Existing and New Infrastructures	9
1.2.2. Entry-Exit Zone	10
1.2.3. Domestic Impediments to Markets in Estonia	11
1.3. Challenges Facing a Regional LNG Market	12
1.3.1. LNG in Lithuania: Why There is no Market Impetus	12
1.3.2. Regional LNG Markets	14
1.4. Dependence on Russian Gas: Importance of Adherence to Market Norms	16
1.4.1. LNG Export Demonopolisation	17
1.4.2. Effects of the EU Antitrust Case Against Gazprom	17
1.4.3. Pricing Practices: EU Hubs are Price Makers	18
2. Gas and the Energy Transition	20
2.1. Self-Sufficiency and Inter-Fuel Competition	20
2.1.1. Energy Security as Self-Sufficiency: Misplaced Focus?	21
2.1.2. Inter-Fuel Competition and Security: Why it Matters	21
2.1.3. Willingness to Pay and Energy Security: Opposite Curves	22
2.2. Stimulating Gas Demand as the Core Challenge	23
2.2.1. Imported Electricity Instead of a Local Gas Market?	23
2.2.2. Gas Demand in Electricity	24
2.2.3. Gas in Transport	25
2.3. Gas, Methane Emissions and Biogas	26
2.3.1. Biogas and Biomethane in Estonia	26
2.3.2. Biomethane Versus Electricity in Transport	27
3. Regional Gas Markets and Geopolitics	29
3.1. EU-Russia Energy Relations: Classifying Risks	29
3.1.1. Risks of Gas Flow Disruptions	30
3.1.2. The Deinstitutionalisation of International Energy Governance	30
3.2. The WTO Case and its Implications	32
3.2.1. The WTO Decision	33
3.2.2. Implications of the Case for the Baltic Gas Market	33
3.3. Russia-US Competition for European Gas Market	34
3.4. Nord Stream 2: Intra-EU Controversies	35
3.4.1. Political Controversies	35
3.4.2. Legal Controversies	36
3.4.3. Implications for the Baltic Region	37
Conclusions and Recommendations	38
List of References	41

LIST OF FIGURES AND TABLES

FIGURES

Figure 1. EU Policy Hierarchy	3
Figure 2. European Gas Market Design	5
Figure 3. LNG Supply Chain	6
Figure 4. Pipeline Network in the Baltic States and Finland	9
Figure 5. Entry-Exit Zone	10
Figure 6. LNG Facilities in the Baltic Sea	15
Figure 7. Dynamics of Oil Price, Oil Indexed Gas Price and Gas Hub, 2012-2015	19
Figure 8. Effects of Inter-Fuel Competition	22
Figure 9. WTP and Energy Security	22
Figure 10. Gas Infrastructure Outlook	29
Figure 11. Energy Charter Treaty Process	31
Figure 12. Energy Charter Structure	32
Figure 13. Market Scenarios	39

TABLES

Table 1. Types of Contracts in Gas Hub Trading	7
Table 2. Gas Market in Estonia	11
Table 3. Estonia's National CNG Consumption	25

EXECUTIVE SUMMARY

The first part of this study focuses on new challenges surrounding natural gas markets in the light of the new entry-exit zone agreed between Estonia, Finland and Latvia. The analysis focuses on the ideal market design proposed in the European Union (EU) Gas Target Model and emerging natural gas hubs. Hubs include competitive trading schemes and allow for the trading of gas on a virtual platform independently of its physical location and the possibility of multiple gas flows from various entry points. However, it has been observed that mismatches between the entry-exit zone and the EU Gas Target Model continue to exist. Competition is hindered in Estonia by persisting vertical integration. Moreover, state energy companies play an increasing role and hence hinder the provision of incentives to promote competition in Estonia.

Particular attention is given to the evolving liquefied natural gas (LNG) market in the region. Despite initial expectations, FSRU terminal at Klaipėda, known as Klaipėda LNG terminal, has failed to create a basis for competitive supplies. Instead, Klaipėda LNG terminal concluded a long-term supply contract that restricts the scope for competition. State aid is also noted as a barrier to the market-based approach. Considering the current trend towards more diverse LNG supplies, the FSRU scheme may be considered outdated and too expensive compared to newly emerged delivery options. The world markets are evolving towards commodity oversupply and the increasing availability of LNG. LNG has now come of age, which makes it possible to provide gas to off-grid areas and even to use gas as a direct cryogenic fuel. In this context, Estonia has the potential to develop a logistical basis for flexible LNG infrastructures, storage and supply.

The study establishes that relations with Russian companies do not constitute the main impediment to the development of Baltic gas markets, especially following the decision imposed by the European Commission on Gazprom in the context of the recent antitrust case. Price relations are based on natural gas hubs, and gas supply now constitutes a buyers' market.

The second part of the study touches upon the Estonian National Energy and Climate Plan, a draft strategy scheduled for formal adoption by the end of 2019. The study challenges the linear link between energy security and energy dependence by emphasising the need for institutional predictability and logistical availability in fostering market functioning. The debate on the role of natural gas in the energy transition is also addressed. Supplying electricity for consumption in the relevant economic sectors by importing it from the Nordic states would be a costly and economically irrational strategy. Instead, domestic electricity production based on natural gas offers an environmentally friendly and economically viable back-up solution for the promotion of renewable energy. A policy debate is needed over a better balance between the electrification ambitions in national economy as well as road transport and the need for greater reliance on natural gas in domestic electricity generation and transport sectors.

Existing studies on the electrification of road transport fail to take into account the environmental costs that arise from lithium production and the pressure on energy systems caused by increasing use of charging stations for electric vehicles. At the same time, Estonia is emerging as a success story in promoting biomethane in compressed natural gas fuels used in national road transport. Biomethane helps to stimulate the circular economy and has significant potential to contribute to Estonia's renewable energy development targets. The development of LNG in maritime transport may call for the incorporation of permit-based solutions to increase the share of biogas converted into LNG.

The third part of the study addresses the geopolitical dimension of the gas markets. It covers the most recent trends in the Energy Charter process in the light of the termination of the Transit Protocol negotiations. The study notes the relevance of international energy governance, particularly of the 'early warning mechanism'. The study briefly analyses the World Trade Organization case involving Russia and the EU and highlights the market-based principles discussed in the case.

The study notes that Russia-US competition for gas markets increases diversification opportunities, whereas regional liquid gas markets offer greater resilience in relation to international political shocks and the weaponisation of energy relations. At the same time, the advent of LNG supplies from the US opens up a new geopolitical dimension by giving Estonia the opportunity to reinforce its trade relations with US LNG suppliers, potentially through a flexible physical LNG hub in the northern part of the country on the Gulf of Finland coastline.

The study covers political controversies surrounding Nord Stream 2 and concludes that it does not constitute a threat to Estonia's energy security but hinders the solidarity principle enshrined in the Energy Community Treaty.

The conclusion notes three possible scenarios:

- Continuation of the existing imperfect market.
- Gradual evolution towards an ideal market that ensures energy security and competitiveness.
- Pervasive 'weaponisation' of energy relations as part of the broader geopolitical confrontation between Russia and the West.

The scenarios set out above acknowledge that Estonia and the newly established entry-exit zone operate in imperfect markets. The challenge is to turn an imperfect market into an ideal market scenario and to avoid the detrimental effects arising from the weaponisation scenario.

On the basis of the conclusion, the study lists the measures necessary to ensure Estonia's path to an ideal market. The following policy recommendations are highlighted:

- Estonia needs to argue for a **free-market approach to energy security** and promote this principle within the European Council.
- Estonia needs to establish **the position of energy minister** or even create a separate energy ministry. **Greater political weight** is needed to promote the energy policy agenda and Estonia's national interests abroad.
- **Flexible LNG infrastructure** should be favoured over capital-intensive infrastructure, and Estonia has an opportunity to reinforce LNG-to-LNG competition in the region.
- **Vertical integration** in the Estonian gas market needs to be taken seriously into account and conditions for market fragmentation need to be developed.
- In the event of a 'weaponisation' scenario, Estonia should create a framework allowing for **greater reliance on US LNG**, while still working to promote competition in the markets.
- Domestically, the focus should be on **incremental gas demand in power generation and transport**.

INTRODUCTION

Recent years have seen vivid debates on the energy security of the Baltic states. Their dependence on Russia for historical reasons and the resulting infrastructural isolation from the rest of Europe have been the focus of various studies, including the International Centre for Defence and Security (ICDS) report published in 2013.¹ Since then, the construction of pipeline interconnectors with Finland and with Poland has commenced, while Lithuania has developed its own Floating Storage and Regasification Unit (FSRU) in Klaipėda, referred to as Klaipėda LNG terminal. In addition, EU energy policy started taking a new shape with the declaration of the Energy Union in 2015. The Energy Union seeks to create a fully interconnected, integrated and sustainable energy market. In the light of the market's integration objectives, the Baltic region has seen the establishment of a regional agreement on a gas entry-exit zone between Estonia, Finland and Latvia.

Despite formal declarations and newly built infrastructures, significant obstacles to the creation of genuinely competitive gas markets remain

Implementation of the EU Energy Union's objectives became an integral part of the National Energy and Climate Plan, a draft strategy document ought to be adopted by the end of this year.² Interconnections, competitive gas markets

¹ See Arūnas Molis, "Towards a Regional Gas Market in the Baltic States: Political, Economic and Legal Aspects," *Humanities and Social Sciences*, Volume 24 (1), 2016: 91-126; Matthew J. Bryza and Emmet Tuohy, *Connecting the Baltic States to Europe's Gas Market* (Tallinn: International Centre for Defence Studies, 2013), <https://icds.ee/connecting-the-baltic-states-to-europes-gas-market-3/> (accessed 2 April 2019).

² Republic of Estonia, *National Energy and Climate Plan (NECP 2030): Estonia's Communication to the European Commission under Article 9(1) of Regulation (EU) 2018/1999*, Tallinn, December 2018, https://ec.europa.eu/energy/sites/ener/files/documents/ec_courtesy_translation_ee_necp.pdf (accessed 22 April 2019).

and the energy transition are listed in the plan. Yet, despite formal declarations and newly built infrastructures, significant obstacles to the creation of genuinely competitive gas markets remain. Market fragmentation has declined since 2015, and inverse vertical integration has emerged due to a large market segment being controlled by large buyers of gas. Moreover, Klaipėda LNG terminal concluded a new long-term gas supply contract with Norwegian suppliers, without introducing incentives to purchase expensive gas from a large floating facility. Thus far, even the positive changes that have taken place in the markets and the infrastructural diversification that has occurred do not automatically guarantee the secure and sustainable development of the gas sector.

Another challenge is presented by the low gas supply volumes involved, particularly in Estonia. Competition cannot be promoted where the volumes in question are limited. However, opportunities for increased demand exist, given the fast evolution of new technologies relating to gas usage, comprising compressed natural gas (CNG), LNG and biomethane in transport and industries. Gas-driven transport together with a potential shift to gas-fired power plants represent a significant incremental increase in demand for natural gas. Despite the significant potential of these technologies, policies favouring electrification of economic sectors including the road transport might indirectly threaten their usage. The policy challenge will be to make these strategies compatible with each other and cost-efficient.

The imperfect market may be further affected by international political tensions. Among other things, the deinstitutionalisation of energy governance, the controversy between Germany and Poland regarding the Nord Stream 2 pipeline and increasing Russia-US competition have shaped new policy discussions surrounding the gas markets.

In this context, the following questions need to be addressed:

- How should a competitive gas market within the new entry-exit zone between Estonia, Finland and Latvia be created and fostered?
- How should incremental gas demand be favoured in such a way as to be in line with the energy transitions and energy security?

- How does the National Energy and Climate Plan contribute to energy security and what should its priorities be?
- What are the international political risks? What can affect the gas markets? In short, how do the recent international developments – namely EU antitrust monitoring against Gazprom, the WTO case between Russia and the EU and the Nord Stream 2 pipeline – affect Estonian energy security and the newly emerging entry-exit zone?
- What institutional mechanisms does Estonia need to adopt in order to better address challenges both nationally and internationally?

This report divides this wide range of policy questions into three parts:

- (1) focus on gas markets;
- (2) focus on Estonia's energy policy choices; and
- (3) focus on geopolitical factors involving gas and LNG markets.

The conclusion summarises the main challenges posed to the gas markets and to Estonian energy security. A number of policy recommendations are set out at the end of the report.

1. FOCUS ON GAS MARKETS

It may be argued that energy security issues have shifted from the question of infrastructural isolation to the promotion of a cross-border and competitive gas market. A new entry-exit zone between Estonia, Finland and Latvia opens an

It may be argued that energy security issues have shifted from the question of infrastructural isolation to the promotion of a cross-border and competitive gas market

opportunity to create a genuinely competitive gas market. Nevertheless, a functioning gas market requires deeper institutional transformation than formal declarations and agreements. Three sets of issues are addressed below:

- (1) Mismatches between the Gas Target Model proposed by the EU and the regional gas markets developments.
- (2) The inefficient diversification of LNG supply to date.
- (3) Dependence on Russian gas supplies.

All these issues point to a need for a competitive gas market, where the liquidity of the market mechanisms and logistical availability are key drivers of energy security.

1.1. WHY MARKETS ARE NEEDED: FROM GAS HUBS TO ENERGY SECURITY

Both Estonian energy policies and the entry-exit zone between Estonia, Finland and Latvia form part of wider EU energy policy goals. The EU Energy Union declared in 2015 has become the core framework for energy policy objectives that seek to bring about a more diversified, better connected and more sustainable energy sector.³ The EU Energy Union sets out five key targets which incorporate market objectives summarised by the European Commission as follow.

³ For an update on the EU Energy Union, see European Union, European Commission, *Report 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. Fourth Report on the State of the Energy Union*, COM(2019) 175 final, 9 April 2019, https://ec.europa.eu/commission/sites/beta-political/files/fourth-report-state-of-energy-union-april2019_en_0.pdf (accessed 16 April 2019).

WHAT IS THE ENERGY UNION ABOUT?*

The European Commission launched, in February 2015, a new strategy for a resilient Energy Union with a forward-looking climate change policy. The goal of the Energy Union is to give EU consumers – households and businesses – secure, sustainable, competitive and affordable energy. Achieving this goal will require a fundamental transformation of Europe’s energy system.

The Energy Union Strategy is made up of five closely interrelated and mutually reinforcing dimensions, designed to bring greater energy security, sustainability and competitiveness:

- Energy security, solidarity and trust: Diversifying Europe’s sources of energy and making better, more efficient use of energy produced within the EU.
- A fully-integrated internal energy market: Using interconnectors which enable energy to flow freely across the EU – without any technical or regulatory barriers. Only then can energy providers freely compete and provide the best energy prices.
- Energy efficiency contributing to moderation of demand: Consuming less energy in order to reduce pollution and preserve domestic energy sources. This will reduce the EU’s need for energy imports.
- Decarbonising the economy: Pushing for a global deal for climate change and encouraging private investment in new infrastructure and technologies.
- Research, innovation and competitiveness: Supporting breakthroughs in low-carbon technologies by coordinating research and helping to finance projects in partnership with the private sector.

The State of the Energy Union monitors each year the progress made and highlights the issues where further attention is needed. It shows progress made since the Energy Union Framework Strategy was adopted to bring about the transition to a low-carbon, secure and competitive economy.

*See “Building the energy union,” Energy Strategy and Energy Union, European Union, European Commission, <https://ec.europa.eu/energy/topics/energy-strategy-and-energy-union/building-energy-union> (accessed 16 April 2019).

The EU Energy Union is a political framework based on existing legislative mechanisms ranging from competition rules to market-specific norms and regulations. For more than two decades, EU policy aimed at breaking up the vertically-integrated monopolies that had historically dominated the operation of the gas sector.

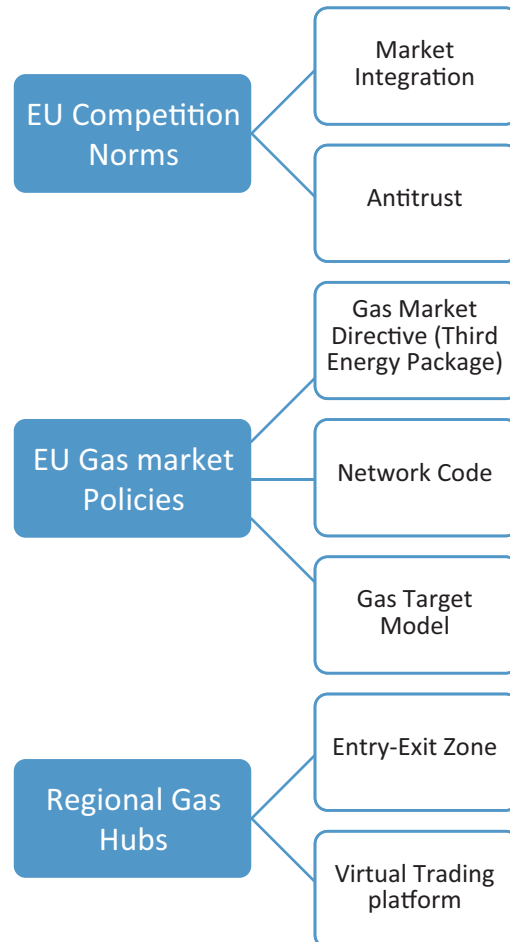


Figure 1. EU Policy Hierarchy⁴

Competition policy in the gas sector is framed by the Third Energy Package, which comprises two directives and three regulations, of which the Gas Market Directive (Directive 2009/73/EC) is the most relevant for present purposes.⁵ Among other matters, the Third Energy Package provides for unbundling between the supply and transportation of grid-bound

⁴ Figures are schematised by the author unless stated and referenced otherwise.

⁵ European Union, “Directive 2009/73/EC of the European Parliament and of the Council concerning common rules for the internal market in natural gas and repealing Directive 2003/55/EC,” *Official Journal of the European Union*, 14 August 2008, <https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:32009L0073&from=EN> (accessed 16 April 2019), p. 94.

energy (electricity and gas) and sets out rules governing open access to pipelines, i.e. TPA. The competition norms are applied in order to avoid former sector monopolies continuing to hold dominant market positions and carrying out market partitioning between each other.⁶

This legislative framework aims at the creation and maintenance of liquid gas markets around natural gas hubs. A brief overview of the design and objectives of these hubs is provided in order to shed light on the relationship between the markets and energy security.

1.1.1. DESIGNING GAS HUBS

In the context of the Energy Union, gas trading hubs are the pivotal element in the European policy approach. The notion of a trading gas hub

Gas trading hubs are the pivotal element in the European policy approach

here differs from a classical notion of a physical gas hub, defined by a pipeline intersection.⁷ In relation to the issue in question, a hub amounts to a trading platform created in order to optimise supply-demand interactions. Competition in the market is made possible because suppliers gain the opportunity to use pipeline networks without relinquishing ownership of the gas. This relationship between suppliers and network operators requires non-discriminatory implementation of TPA. The legal right to ownership of gas also stimulates a 'paper trade': market participants can purchase a right over the commodity and retrade it, without a requirement for it to be physically supplied. Consequently, a contracted volume of gas traded can differ from actual

physical flows and, in a competitive market, trade flows outstrip physical ones.⁸

The world's largest and most liquid gas hub is Henry Hub, which operates on the East Coast of the US and on which market-based trading has been carried out since April 1990. The

The hubs provide for high level of market flexibility, which creates supply resilience in the event of disruption at one of the points in the system

first large European gas hub, National Balance Point (NBP), was established in the UK in the late 1990s. Unlike Henry Hub, NBP has no geographical presence and is solely a virtual trading platform. The hubs provide for high level of market flexibility, which creates supply resilience in the event of disruption at one of the points in the system. Moreover, since buyers and sellers are united in the same market place, both hubs have become price-makers, thus reducing the scope for non-market impact on pricing.⁹

Since the early 2000s, both Henry Hub and NBP have constituted a blueprint for gas industries and traders almost worldwide. In the Eurozone, the most liquid gas hub, the Title Transfer Facility (TTF), is based in the Netherlands. The trend towards gas trading platforms is also widespread beyond Europe. Despite ongoing frictions with the West, Russia has established a trading gas hub in Saint Petersburg which so far operates with only limited supply volumes.

The further development of gas hubs is a key aim within the EU Gas Target Model elaborated by the EU Agency for the Cooperation of Energy

⁶ For an in-depth legal analysis, see Kim Talus, *Introduction to EU Energy Law* (Oxford: Oxford University Press, 2016).

⁷ In some cases, a physical hub is combined with a trading hub, e.g. the Belgian Fluxys and Austrian Baumgarten. For an up to date assessment of European gas hubs, see Patrick Heather, "European traded gas hubs: An updated analysis on liquidity, maturity and barriers to market integration," Working Paper, Oxford Institute for Energy Studies, May 2017, <https://www.oxfordenergy.org/wpcms/wp-content/uploads/2017/05/European-traded-gas-hubs-an-updated-analysis-on-liquidity-maturity-and-barriers-to-market-integration-OIES-Energy-Insight.pdf> (accessed 16 April 2019).

⁸ The level of competitiveness is measured by a churn rate, which measures how often one calorific value of gas is traded within the market. For details, see "What is liquidity and how do you measure that?," GasTerra, 30 January 2015, <https://www.gasterra.nl/en/news/what-is-liquidity-and-how-do-you-measure-that> (accessed 2 April 2019).

⁹ For details on gas market mechanisms, see Energy Charter Secretariat, *Putting a Price on Energy: New Report on International Oil and Gas Pricing Mechanisms* (Brussels: Energy Charter Secretariat, 2007), https://energycharter.org/fileadmin/DocumentsMedia/Thematic/Oil_and_Gas_Pricing_2007_en.pdf (accessed 2 April 2019).

Regulators (ACER) in 2015.¹⁰ ACER has adopted a timeframe for implementing regulations with a view to achieving competitive and integrated gas markets by 2025. It also envisages the constitution of regional entry-exit zones as an intermediary step towards full pan-European integration. Every regional gas market is obliged to apply the EU network codes in order to reach the maximal level of harmonisation across Europe. The network codes integrate market-based mechanisms for pipeline capacity allocation, congestion management (when contracted volumes exceed a pipeline’s physical capacity) and balancing. Therefore, commodity and pipeline capacity markets are fully separated: the former is organised by virtual platforms and the latter is regulated under the network codes.

1.1.2. ENTRY-EXIT ZONES: DIFFERENT ENTRIES, FLEXIBLE SUPPLY

In accordance with the Gas Target Model, gas hubs are based on entry-exit tariff system operated by pipeline network companies. The system introduces market mechanisms for all entry and exit points of a pipeline network, where suppliers pay for capacity use per unit of time at both entry and exit points.¹¹

The entry-exit zone is combined with a virtual trading platform where gas is traded independently of its physical location. Hence, companies may book pipeline capacity at the entry point and then sell or purchase gas on a virtual platform. Once contracted on the virtual platform, the physical commodity can be directed from any entry point pursuant to the transaction concluded on the virtual platform. In accordance with the model, three categories of consumers will emerge:

- (1) wholesale consumers – usually industrial facilities and large companies able to obtain physical volumes of gas directly from a transmission line;

- (2) retail consumers, who obtain natural gas via distribution system operators with a different pipeline network and can constitute a separate entry point for further gas deliveries;
- (3) traders, who purchase a right to own a gas volume in order to resell it and hence without any need to book capacity at the entry points.

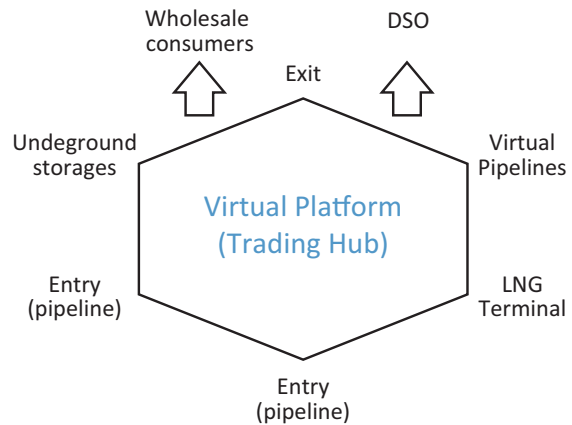


Figure 2. European Gas Market Design

A liquid trading system should also be accompanied by a flexible system for the physical delivery of gas. Therefore, underground gas storage (UGS) plays a crucial role by allowing access to natural gas volumes on a flexible basis without raising production levels. The principal difficulty in using UGS lies in the fact that there are seasonal injection (towards summertime) and withdrawal periods (towards wintertime). Although UGS offers greater flexibility than adjusting production levels in the gas field, this flexibility may not entirely reflect the daily volatility of the demand for gas. Thus, LNG supplies also play a particularly crucial role in ensuring market flexibility.

LNG storage facilities play an increasingly important role across Europe

In this context, LNG storage facilities play an increasingly important role across Europe. Some industry representatives have even noted that the complexity of the EU network codes often disincentivises small gas traders who accordingly prefer to focus on LNG for storage and supply instead of UGS.¹² In contrast

¹⁰ Agency for the Cooperation of Energy Regulators, *European Gas Target Model: Review and Update* (Ljubljana: ACER, January 2015), <https://www.acer.europa.eu/Events/Presentation-of-ACER-Gas-Target-Model-/Documents/European%20Gas%20Target%20Model%20Review%20and%20Update.pdf> (accessed 16 April 2019).

¹¹ For more detail, see European Union, European Commission, “Entry-Exit Regimes in Gas,” European Commission, 2018, <https://ec.europa.eu/energy/en/studies/entry-exit-regimes-gas> (accessed 16 April 2019).

¹² This topic was also discussed with Fluxys representatives at the Florence School during a special event devoted to the EU gas markets at the Florence School of Regulation on 4 April 2016.

to UGS and pipeline-based entry points, LNG storage facilities can provide flexible supplies at any time and even deliver the product to off-grid areas. Modern technologies also allow LNG either to be regasified on the spot or used directly as a cryogenic fuel.

flexibility of gas delivery without dependence on pipeline infrastructure. The most modern of the containers available can be used to store LNG for up to 75 days, which means that they can also serve as small short-term storage facilities in themselves. In the mid-term perspective, container-based shipment of LNG will facilitate competition from various LNG terminals, storage facilities and even harbours with uploading facilities for containers. In view of the higher operational costs associated with virtual pipelines, containers can be considered as a complementary tool in relation to pipeline deliveries without the need to carry out full substitution of pipeline-shipped gas.¹³

The development of the direct usage of LNG is related to the development of small scale LNG production and storage as well as LNG transport via virtual pipelines (Figure 3).

The use of virtual pipelines may increase security of supply by boosting the flexibility of gas delivery without dependence on pipeline infrastructure

To supply gas off-grid, various types of containers and trucks are used to transport either liquefied or compressed forms of gas. These transportation methods are referred as ‘virtual pipelines’ since they provide alternative means to ship gas without the pipeline infrastructure. The use of virtual pipelines may increase security of supply by boosting the

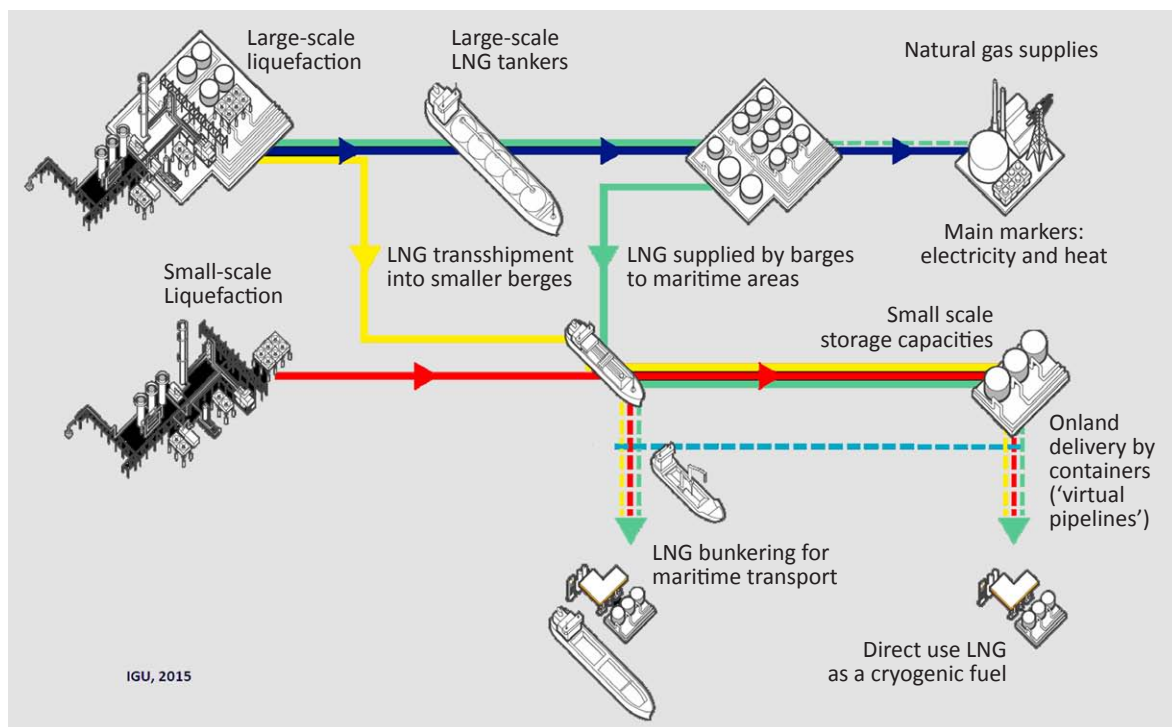


Figure 3. LNG Supply Chain¹⁴

¹³ Agency for the Cooperation of Energy Regulators, “ACER’s vision of the European gas market,” ACER, January 2015, <https://acer.europa.eu/Media/Citizens%20summaries/ACER-CS-01-15.pdf> (accessed 16 April 2019).

¹⁴ International Gas Union, *World LNG Report: 2015 Edition* (Fornebu: International Gas Union, 2015), https://www.igu.org/sites/default/files/node-page-field_file/IGU-World%20LNG%20Report-2015%20Edition.pdf (accessed 22 April 2019). Figure adapted by the author.

In this context, additional pipeline infrastructure and interconnectors lose their economic rationale. Instead, investment in flexible solutions for LNG storage and supply may better reflect the trends in the gas markets.

1.1.3. FLEXIBILITY LEADS TO SECURITY

The entry-exit zone breaks with the pattern followed in traditional schemes, which are characterised by the flow of gas in one direction from a producer to a consumer involving vertically integrated companies across the supply chain. Instead, the entry-exit system allows for the trading of gas independently of its physical location, and offers the possibility for large scale consumers to have direct access to various suppliers and for suppliers to switch entry points in the event of a disruption in one of the entry points. In an ideal market, contracts concluded on a virtual platform are anonymous and therefore the physical origin of gas becomes irrelevant.

In this context, additional pipeline infrastructure and interconnectors lose their economic rationale

Gas hubs imply a break with long-term gas supply contracts with take-or-pay clauses requiring a minimum gas volume to be purchased despite demand fluctuations. In a hub-based system, long-term contracts are possible in the context of forward agreements between a supplier and a consumer. The length of forward contracts has gradually decreased as compared to practice in the traditional gas supply system, which involves longer-term contracts. More competitive markets include futures contracts, where both price and delivery are fixed in advance. Finally, left-over gas is sold by means of daily transactions within spot deliveries. Hence, hubs imply various flexible trading mechanisms, including spot, forward and futures contracts.¹⁵ A competitive price without market partitioning and political influences is ensured by the co-existence of different trading opportunities.

¹⁵ Spot contracts dominate in most European hubs and therefore observers tend to confuse hub-based price mechanisms with spot pricing. Nevertheless, hub mechanisms are broader than the spot market as such and markets with higher liquidity tend to include more futures contracts.

Table 1. Types of Contracts in Gas Hub Trading

Spot contracts	Intra-day transaction
Forward contracts	Contract with a payment date after the notification of a transaction in which there is a fixed period for delivery
Futures contracts	Contracts where both price and delivery are fixed in advance

In the light of the development of hub trading, the TTF has become the most widespread price benchmark in Europe. However, in the Baltic states, Gaspool, based in Germany, seems to be even more frequently used as a reference point. Although bilateral gas supply contracts outside trading platforms have not disappeared, companies tend in many situations to refer to the TTF or Gaspool price.¹⁶

More flexible trading leads to more flexible physical supply. The wider use of storage facilities and virtual pipelines may increase security of supply and increase physical gas-to-gas competition. Therefore, the Gas Target Model emphasises the need for new infrastructural initiatives, such as ‘blue corridors’ for CNG and LNG distribution as well as for uploading facilities for virtual pipelines. Greater market liquidity tends to reinforce market resilience to any technical or political disruptions.

Greater market liquidity tends to reinforce market resilience to any technical or political disruptions

1.1.4. CHALLENGE: TO RECONCILE DIVERGENT OBJECTIVES

Despite its explicit objective of supporting a market approach, the EU’s energy policy conflicts with the ultimate objective of achieving the internal energy market in a number of ways. Among other things, the EU Third Energy Package requires the full application of market norms at the level of wholesale

¹⁶ Observation based on discussions at the ICIS, “The 11th European Gas Conference and LNG Forum,” ICIS, Amsterdam, 20-21 September 2017, and individual contacts with gas suppliers in Estonia and Latvia.

markets and transmission system operators (TSOs), but leaves scope for exemptions from full ownership unbundling for distribution system operators. In principle, a distribution system operator can be controlled by a former monopoly and can therefore require the booking of a segment in the transmission system under long-term conditions. Even though the Gas Market Directive seeks to prevent such situations, it remains difficult to avoid informal contacts and practices that are the legacy of former monopolies.¹⁷

Full market integration can be impeded by focused state support mechanisms across the EU and legitimised within the context of EU state aid policies

Furthermore, full market integration can be impeded by focused state support mechanisms across the EU and legitimised within the context of EU state aid policies. Where state support is given, some infrastructures and suppliers become more competitive regardless of market conditions and either the company's costs are passed on to final consumers or new supply solutions create an uncomfortable imbalance in the market for other gas suppliers. Hence, the overall EU model is still in search of the right balance between the mutually exclusive principles of purely market and subsidy-driven approaches. In the eyes of some observers, the EU has, paradoxically, taken over from states in maintaining the top-down model for support of the natural gas infrastructures.¹⁸

The overall EU model is still in search of the right balance between the mutually exclusive principles of purely market and subsidy-driven approaches

¹⁷ Article 26(1) of Directive 2009/73/EC stipulates as follows: 'Where the distribution system operator is part of a vertically integrated undertaking, it shall be independent at least in terms of its legal form, organisation and decision making from other activities not relating to distribution. Those rules shall not create an obligation to separate the ownership of assets of the distribution system from the vertically integrated undertaking.' European Union, "Directive 2009/73/EC."

¹⁸ Kim Talus, "European Union Energy: New Role for States and markets," in *States and Markets in Hydrocarbon Sectors*, ed. Andrei Belyi and Kim Talus (London: Palgrave Macmillan, 2015): 198-213.

In addition to that, gas sectors and infrastructure are not uniform across EU Member States: some maintain dedicated transit pipelines, some experience frequent congestion and have introduced limits on capacity allocation, others lack market liquidity at entry points, etc.¹⁹

Although the Gas Target Model views regional markets as temporary solutions, it seems that regional realities will dominate the picture at least for the coming decades. It may be more realistic to expect regional groupings to dominate the EU gas market structure and to function in accordance with the market realities on the ground. Given the time available for regional players to agree on one entry-exit zone, it is practically impossible to expect full market integration by 2025. This also means that one cannot expect that any gas flows, for example from either Algeria or Norway to the Baltic states, will take place. A potential supplier will have to face entry and exit tariffs along the way in addition to elevated operational costs due to distance.

Considering the quasi-permanent essence of the entry-exit zones and the de facto impossibility of free gas flows across Europe, Estonia, Finland and Latvia need to take their own measures to establish and maintain institutions that ensure competitive and secure gas markets within their own regional entry-exit zone.

1.2. BALTIC GAS INFRASTRUCTURES AND THE NEWLY FORMED ENTRY-EXIT ZONE

As mentioned above, liquid gas hubs are intended to improve security of supply by creating a flexible delivery and trading system. In accordance with the Gas Target Model objectives, Estonia, Finland and Latvia have created a common entry-exit system. However, formal agreements and declarations are insufficient to create a competitive market securing regional gas supplies.

¹⁹ DNV KEMA, *Study on Entry-Exit Regimes in Gas* (Groningen: KEMA Nederland B.V., 2013), <https://ec.europa.eu/energy/sites/ener/files/documents/201307-entry-exit-regimes-in-gas-parta.pdf> (accessed 19 April 2019).

1.2.1. EXISTING AND NEW INFRASTRUCTURES

In terms of infrastructure, the national gas pipeline network and related infrastructure are inherited from the Soviet period. Gas was separately delivered to Finland and to each Baltic state during that period. The Latvian UGS in Inčukalns is connected to both the Lithuanian and Estonian networks and constitutes an important balancing point for south-to-north gas flows from Latvia to Estonia. Finland receives supplies from Russia via Imatra, which has no connection to the Latvian UGS in Inčukalns.

In the light of the EU policy of Trans-European Networks (TEN) or energy, a gas interconnector between Estonia and Finland – named Baltic Connector – is included in the EU’s projects of common interest. The Baltic Connector between Estonia and Finland is currently under construction and constitutes the necessary infrastructure connecting Latvia, Estonia and Finland. Progress on the Interconnector has been rapid and it is likely to be operational as early as 2020.



Figure 4. Pipeline Network in the Baltic States and Finland²⁰

²⁰ The chart was prepared by Hayrpi Karapetyan, an intern at Balesene OÜ (January-March 2019), on the basis of combined data available on the existing and planned networks. The map takes into account the following sources: European Network of Transmission System Operators for Gas (ENTSO), *Ten-Year Network Development Plan: Infrastructure Report 2018* (Brussels: ENTSOG, 2018), https://www.entsog.eu/sites/default/files/2018-12/ENTSOG_TYNDP_2018_Infrastructure%20Report_web.pdf (accessed 19 April 2019); and European Network of Transmission System Operators for Gas (ENTSO), *Baltic Energy Market Interconnection Plan* (Brussels: ENTSOG, 2017), https://www.entsog.eu/sites/default/files/files-old-website/publications/GRIPs/2017/entsog_BEMIP_GRIP_2017_Main_web_s.pdf (accessed 19 April 2019); European Network of Transmission System Operators for Gas (ENTSO), *BEMIP Gas Regional Investment Plan 2012 – 2021* (Brussels: ENTSOG, 2012), https://www.entsog.eu/sites/default/files/entsog-migration/publications/GRIPs/2012/GRIP_BEMIP_MAIN.pdf (accessed 19 April 2019); Elering, *Estonian Gas Transmission Network Development Plan 2018 – 2027* (Tallinn: Elering AS, 2018), https://elering.ee/sites/default/files/attachments/Estonian_gas_transmission_network_development_plan_2018_2027.pdf (accessed 19 April 2019); AmberGrid, *Natural Gas Transmission System Operator’s Ten-Year Network Development Plan 2018–2027* (Vilnius: AB AmberGrid, 2018), https://www.ambergrid.lt/uploads/structure/docs/220_28c0f30a8f3970420eeda91b06cf3212.pdf (accessed 19 April 2019).

The Baltic Connector is designed to create a new opportunity for south-to-north supply that will now be enabled from the Latvian UGS to Finland. In this way, the Latvian UGS can be also used by Finnish customers via a pipeline connection through Estonia and the Baltic Connector.

1.2.2. ENTRY-EXIT ZONE



Figure 5. Entry-Exit Zone

Following the introduction of the common entry-exit zone between Latvia, Estonia and Finland, the three states will have common entry points for pipeline access ranged from north to south: Imatra, Narva, Värskä, Misso and Kiemėnai. Gas suppliers delivering gas to these points will need to pay an entry fee calculated in inverse ratio to the length of the period for which the booking is made. In this way, the fee rate in pro rata terms will be significantly lower for a one-year booking of capacity than for an intra-day booking.²¹ Transmission fees for natural gas delivery will be discontinued within the area covered by the entry-exit zone. Revenue from entry points is accordingly to be coordinated between the transmission system operators of the participating states. It was partly for this reason that Lithuania declined to participate in the entry-exit zone: a transit line connecting Belarus with the Russian enclave of

²¹ Currently, tariffs are subject to public consultation. The following preliminary figures for capacity booking in EUR/MWh have been proposed: one year – €0.39; a quarter – €0.43; one month – €0.49; one day – €0.59; intra-day – €0.66. The information presented by Zane Kotane, “Vienotais Dabaszgāzes Tirgus 2020” (Single Natural Gas Market 2020), Connexus Baltic Grid, Riga Energy Forum, Riga, 7 March 2019.

Kaliningrad traverses Lithuania, meaning that revenues accruing within the transit would also be distributed to other participants in the zone. It is worth noting that Lithuania participated in the negotiations until 2017.²² Nevertheless, at the later stage of these negotiations, Lithuania decided to discontinue its participation in the entry-exit zone. As a consequence, Lithuanian gas suppliers will have to pay a fee at the Kiemėnai entry point.

Once capacity is booked at entry level, the supplier needs to agree with a shipping company to physically deliver natural gas to the end user. The national rules in force in each participant state will apply in respect of contractual arrangements between the supplier, the shipper and traders.

The area within these entry points constitutes a basis for a physical common market and common balancing platform.²³ Estonia and Latvia plan to create their common balancing platform by 2020, and Finland – whose gas market is currently being restructured – is expected to join by 2022.²⁴

²² Republic of Lithuania, National Commission for Energy Control and Prices, “Energy Regulators of the Baltic States and Finland Agree on the Pricing of Services of Natural Gas Transmission in the Region,” National Commission for Energy Control and Prices, 9 November 2017, <https://www.vkekk.lt/en/Pages/Updates/Energy-Regulators-of-the-Baltic-States-and-Finland-Agree-on-the-Pricing-of-Services-of-Natural-Gas-Transmission-in-the-Regi.aspx> (accessed 16 April 2019).

²³ A balancing platform is defined as ‘a trading platform on which flexible gas is bought and sold, balancing services are procured and the TSO is party to every trade’. In other words, gas trade is limited to leftover gas and balancing demand surplus. Balancing services are defined as ‘additional services (i.e. additional to the buying and selling of flexible gas) that a TSO may buy in order for the system to remain within safe operational limits, for example the ability to inject gas into storage’. For further details, see Agency for the Cooperation of Energy Regulators, *Framework Guidelines on Gas Balancing in Transmission Systems: Draft for Consultation (Update)* (Ljubljana: ACER, 12 April 2011), http://www.acer.europa.eu/Official_documents/Public_consultations/Closed%20public%20consultations/PC-04_FG_Gas_Balancing_in_Transmission_Systems/Document%20Library/1/DFGC_2011G002%20FG%20Gas%20Balancing.pdf (accessed 16 April 2019).

²⁴ Finland is currently restructuring its gas market, and there is a new proposal for amendment of the Gas Market Act and the Natural Gas Control Act (Section 10). See Republic of Finland, Eduskunta, “Hallituksen esitys eduskunnalle laeiksi maakaasumarkkinalain, sähkö- ja maakaasumarkkinoiden valvonnasta annetun lain 10 §:n sekä sähkömarkkinalain 56 §:n muuttamisesta” (Proposal by the Government to the Parliament to amend Article 10 of the Natural Gas Market Act, the Act on the Supervision of the Electricity and Natural Gas Market and Section 56 of the Electricity Market Act), Eduskunta, HE 290/2018 vp, https://www.eduskunta.fi/FI/vaski/HallituksenEsitys/Documents/HE_290+2018.pdf (accessed 16 April 2019).

The picture becomes more complex when virtual trading platforms are considered. In fact, since 2012 there has been a virtual trading platform – called Get Baltic – that allows traders from the three Baltic states to trade gas. As noted above, a virtual platform can be used by traders of any kind and can also be used to carry out exchanges resulting from balancing. Estonia and Latvia may use Get Baltic, among other options, as part of their balancing market or to create a new one. Since a common balancing platform is to be created between the two Baltic states and Finland, Get Baltic plans to offer services to traders from Finland by way of expanding its platform services.

Lithuania’s absence from the entry-exit zone creates a significant mismatch between the

Lithuania’s absence from the entry-exit zone creates a significant mismatch between the participants in the entry-exit system (Latvia, Estonia and Finland) and the virtual platform Get Baltic (Lithuania, Latvia, Estonia)

participants in the entry-exit system (Latvia, Estonia and Finland) and the virtual platform Get Baltic (Lithuania, Latvia, Estonia). As a result of this, Estonia, Latvia and Finland may at least investigate alternatives to the existing structures of the Get Baltic platform. Moreover, as noted below, the state aid given by Lithuania to Klaipėda LNG terminal constitutes a serious impediment to full market integration in the region.

A future common virtual platform for Estonia, Latvia and Finland should be related to their common entry-exit zone in order to avoid mismatches and distortion of the integrated regional market.

1.2.3. DOMESTIC IMPEDIMENTS TO MARKETS IN ESTONIA

The domestic market structure constitutes the main impediment to market liquidity. Although a move towards an integrated market is an important step, the market needs to be more fragmented. This in turn requires a larger number of suppliers to be active within it. Instead, at least in Estonia, the market has in fact becomes less fragmented since 2015.

Table 2. Gas Market in Estonia²⁵

	2015	2016	2017
Eesti Gaas share of imports	77%	92%	88%
Others: share of imports	23%	8%	12%
Number of importers	5	4	3

Over the three years observed, the number of non-incumbent importers declined despite the governmental target of 32% of market share limit of the largest supplier company.²⁶ Instead, the incumbent, Eesti Gaas, has increased its market share from 77 to 88% during the period between 2015 and 2017.

Eesti Gaas is a privately owned company currently controlled by Trilini Energy, a member of the Inforfar Group. The latter is also the owner of Tallink, a large energy consuming group which is one of Estonia’s major gas consumers. In 2017, the main competitors of the incumbent were state-owned companies, namely Elektrum Eesti (8% market share) and Eesti Energia (4% market share). The state-owned energy company Eesti Energia (4% import share) is a potential long-term gas consumer in the electricity sector and is, in common with Eesti Gaas, an important buyer at national level. Elektrum Eesti is a subsidiary of Latvenergo, a company owned by the Latvian state, and its large presence in the market only confirms a trend towards market dominance by the incumbent and state-owned operators.²⁷

As a result, we may observe an inverse vertical integration, where major gas buyers acquire the largest share of the gas supply company. This is a deep-rooted shortcoming of the Gas Market Directive in respect of the unbundling of distribution system operators, as discussed earlier. Since the Third Energy Package focuses on the interests of buyers, it does not envisage a situation where buyers linked to incumbents

²⁵ Details on Estonia gas markets trends provided by the Competition Authority of the Republic of Estonia. See Republic of Estonia, Competition Authority, “Gas Markets Review,” Competition Authority, 2015, 2016, 2017, <https://www.konkurentsiamet.ee/?id=14463> (accessed 2 April 2019).

²⁶ Republic of Estonia, Ministry of Economic Affairs and Communication, *Energiamajanduse arengukava aastani 2030* (Energy development plan until 2030), Ministry of Economic Affairs and Communication, Order 285, 20 October 2017, https://www.mkm.ee/sites/default/files/enmak_2030.pdf (accessed 16 April 2019).

²⁷ Republic of Estonia, Competition Authority, “Gas Markets Review.”

and state-owned companies favour long-term bilateral contracts, thus impeding competition.

In this context, the market does not leave much space for competitive futures contracts. A spot market may emerge for leftover gas contracted under long-term bilateral contracts. As a result, there is a risk in respect of the Baltic entry-exit zone that a lack of market liquidity may nullify the most important advantages of a potential gas hub.

Transmission networks of Estonia are operated by a state-owned company, Elering. State ownership of networks is not an issue per se in relation to the full ownership unbundling of the sector. However, in the context of inverse vertical integration, a state-owned operator may tend to favour only long-term capacity booking from entry points in such a way as to deter independent gas suppliers and traders from participating in the market. Furthermore, a widespread perception that the state has an ever-growing role in the Estonian economy is certainly damaging in terms of its effect on newcomers' attitudes towards the possibility of entering the gas markets.

In order to ensure successful market design within the entry-exit zone, Estonia should ensure that market fragmentation occurs in the gas sector and should avoid inverse vertical integration. For these purposes, national competition authorities should reinforce their focus on the energy markets in order to promote competition in the sector. Furthermore, Estonia may need to consider establishing an independent energy regulatory authority – in addition to the existing competition authority – to implement these tasks.

1.3. CHALLENGES FACING A REGIONAL LNG MARKET

Most of the earlier efforts made to secure the gas supplies of the three Baltic states and Finland focused on finding alternative supply sources to Russia. The floating LNG terminal at Klaipėda was established in order to provide an alternative gas supply route. However, Lithuanian importers concluded a new long-term agreement with Norwegian suppliers and failed to cultivate the possibility of spot and future contracts.

Lithuania's non-participation in the entry-exit agreement further complicates the use of the Klaipėda LNG terminal in the zone's pipeline networks. It may also be noted that the creation of a liquid gas hub would require infrastructure for decentralised LNG supplies and bunkering within the entry-exit zone.

Lithuania's non-participation in the entry-exit agreement further complicates the use of the Klaipėda LNG terminal in the zone's pipeline networks

1.3.1. LNG IN LITHUANIA: WHY THERE IS NO MARKET IMPETUS

The FSRU in Klaipėda did not signify a breakthrough for regional gas supplies despite initial expectations.²⁸ Instead of forging new market opportunities, the operator of Klaipėda LNG terminal negotiated a long-term supply agreement with Statoil (now Equinor) and reduced incentives for other flexible transactions, such as spot, futures and forward contracts. Furthermore, industry representatives have identified difficulties in accessing the terminal mostly because of the long-term contract in place.

An important issue arises regarding the state support received by Klaipėda LNG terminal and authorised by the European Commission. In fact, the Lithuanian state exempted the FSRU from regasification costs until at least 2024, although regasification should happen continuously on the floating platform.²⁹ Penetration of

²⁸ Kari Liuhto, "Liquefied Natural Gas in the Baltic Sea Region," *Journal of East-West Business*, Vol. 19 (1-2), 2013: 33-46.

²⁹ Operating aid has the duration of 55 years starting from 2013; however, the exact limits of the state aid are fixed until 2024 and will need a further reassessment. See European Union, European Commission, "State Aid SA.44678 (2018/N) – Lithuania – Modification of aid for LNG Terminal in Lithuania," C(2018) 7141 final, 31 October 2018, http://ec.europa.eu/competition/state_aid/cases/275450/275450_2035277_133_2.pdf (accessed 16 April 2019). The Lithuanian regulator established a 'security mark-up' collected from gas consumers to defray operational costs. In 2013-14, the overall security mark-up raised €30.7 million; in 2017 it amounted to €88 million; and in 2018 it amounted to €86.7 million. See Republic of Lithuania, National Commission for Energy Control and Prices, "Komisija pakoregavo 2019 metams nustatytą SGD terminalo saugumo dedamąją" (The Commission adjusted the LNG terminal's security mark-up for 2019), National Commission for Energy Control and Prices, 31 December 2018, <https://www.regula.lt/Puslapijai/naujienos/2018-metai/2018-gruodis/2018-12-31/komisija-pakoregavo-2019-metams-nustatyta-sgdt-saugumo-dedamaja.aspx> (accessed 2 April 2019).

the Klaipėda gas into the networks would generate economic difficulties. For example, the following question arises: if Klaipėda LNG

An important issue arises regarding the state support received by Klaipėda LNG terminal and authorised by the European Commission

is regasified and then shipped to the Latvian UGS, who will cover the regasification costs? Will it be the UGS or the final consumers? In either case, the commercialisation of this gas can create significant price concerns for the Latvian UGS.

It could also be argued that the state aid allocated to Klaipėda LNG terminal may create an imbalance of market realities for regional suppliers.³⁰ In order to justify the state aid, the European Commission's assessment regarding Klaipėda LNG terminal is as follows:

Annual capacity bookings or spot bookings are not sufficient to ensure stable operation of the LNG Terminal. This is because first, deliveries under annual bookings can always be redirected to another delivery point if LNG prices justify it and second, LNG operations must be planned two weeks in advance so the terminal cannot rely on spot deliveries. Therefore, the Commission asserts that some LNG quantities must be delivered on an even basis throughout the year in accordance with a fixed schedule, including the periods when the demand for natural gas is low.³¹

This assessment seems not to take into consideration the growing availability of more competitive LNG cargoes across the Baltic region. Furthermore, assessment of the low level of annual and spot capacity booking simply reveals that the floating terminal generated only lukewarm interest among market players. Some industry experts argue that the state support given to Klaipėda LNG terminal constitutes an impediment to Lithuania's participation in the

³⁰ According to the European Commission, 'the total budget for the scheme is €276 703 731 covering the period 2016 to 2024. The total budget for the measure during the period 2016-2019 scheme is €78 631 120'. See European Union, European Commission, "State Aid SA.44678 (2018/N) – Lithuania".

³¹ *Ibid.*, para. 128.

entry-exit zone. At the same time, injection of Klaipėda gas into an UGS would become even costlier because of the entry fees applied under the new agreement between Estonia, Finland and Latvia.

Meanwhile, a recent analysis by Pöyry consultancy indicates that the best market scenario for Klaipėda LNG FSRU lies in integrating Lithuania into the newly formed Baltic entry-exit zone.³² Despite an optimistic estimate of the demand for gas from the Klaipėda terminal, Pöyry's analysis also points to a gradual decline in purchases by Litgas – a dedicated supplier of Klaipėda LNG. Furthermore, the Pöyry report indicates significant operational costs, which casts doubt on Pöyry's optimistic forecasts made in respect of the terminal.³³ In addition to this, the need to charge customers an additional fee would continue even after 2024.³⁴ Therefore, it seems that the terminal will not be able to operate in the absence of the long-term provision of state aid.

Indeed, outside the mandatory purchases from the terminal required by Lithuanian legislation, demand for Klaipėda LNG decreased and Russia's Gazprom share in Lithuania's gas market increased

Indeed, outside the mandatory purchases from the terminal required by Lithuanian legislation, demand for Klaipėda LNG decreased and Russia's Gazprom share in Lithuania's gas market increased. Russian gas supplies to

³² Pöyry Management Consulting (UK) Ltd, *Independent Economic Analysis of The Long -Term Liquefied Natural Gas Import Solution to the Republic of Lithuania: Report for Klaipėda Nafta* (Oxford: Pöyry Management Consulting (UK) Ltd, 2018), https://www.kn.lt/uploads/files/dir49/dir2/9_0.php?fbclid=IwAR3mgejXwWzDqPRFjnkMkJsVxQeLtRseeIKzG6LgMOwQb6XgRW58G63ywjg (accessed 16 April 2019).

³³ The Pöyry report recognises significant annual operational costs in the event that the terminal continues in operation: €10-15 million in the event of overall purchase of Klaipėda LNG FSRU and €25-35 million if it is leased. Although purchase will entail less operational expense, Pöyry estimate that it would call for between €120 million and €160 million in capital investment. Although the Pöyry figures are lower than other estimates and lower than the subsidy estimated by the Lithuanian state, operational costs are expected to be elevated.

³⁴ Lithuania plans to purchase the floating LNG terminal, as announced in November 2018. See "Lithuania to purchase LNG terminal's vessel amid cost cutting efforts," *Xinhua / Delfi.lt*, 22 November 2018, <https://en.delfi.lt/business/lithuania-to-purchase-lng-terminals-vessel-amid-cost-cutting-efforts.d?id=79654421> (accessed 16 April 2019).

Lithuania accounted for 38.5% in 2016 and rose to 54% in 2017, while the percentage share accounted for by Klaipėda LNG terminal fell from 60% to 40% in the same period.³⁵ Consequently, due to the cost structure in place, the effect actually produced ran counter to the true objective behind the establishment of the Klaipėda LNG terminal, which was diversification from Russia supplies.

Once Statoil (Equinor) started to provide gas to the floating LNG terminal, Russia's export monopoly Gazprom lowered the price payable under its bilateral contracts with Lithuanian companies. In fact, Gazprom uses an existing amortised infrastructure and is accordingly able to provide a significant price margin. Furthermore, prior to 2014, an inflated price was charged for the Russian gas provided to Lithuania, probably for political reasons. Hence, Gazprom has had a greater margin of manoeuvre than Klaipėda LNG terminal. Ultimately, competition has emerged between suppliers trading under traditional long-term contracts without involving market-based competition between them. Paradoxically enough, Lithuania's largest gas consumer, Achema, has recently started purchasing LNG from Russian suppliers in order to avoid over-paying for the existing scheme provided by the Klaipėda LNG terminal.³⁶

The Klaipėda LNG terminal illustrates the pernicious effects of state aid arrangements on the markets. It is in Estonia's interests to argue in favour of a market-based approach at EU level. The provision of state aid to Klaipėda LNG FSRU should be viewed as impediment to Lithuania's access to the entry-exit zone.

1.3.2. REGIONAL LNG MARKETS

Because of its significant physical flexibility, LNG is the pivotal segment in the regional gas markets. If in 2007 many assumed that

³⁵ "Gazprom holds 54% Lithuania's gas market in 2017," The Baltic Course, 24 January 2018, <http://www.baltic-course.com/eng/energy/?doc=137070> (accessed 16 April 2019).

³⁶ "Lithuania's Achema, LET buy LNG from Russia's Novatek," The Baltic Course, 18 April 2019, <http://www.baltic-course.com/eng/energy/?doc=148693> (accessed 19 April 2019).

LNG would be profitable only if large ships travelled over a distance exceeding 6,000 kilometres, now the direct use of LNG in the chemicals industry, maritime transport and even co-generation brings a new dimension to

Because of its significant physical flexibility, LNG is the pivotal segment in the regional gas markets

the markets. The direct use of LNG avoids the need for capital-intensive infrastructure and pipelines. Instead, LNG can now be shipped over short distances in containers (virtual pipelines) by ferries, by road and as rail freight. The maritime shipment of LNG by large tankers and small barges has become more competitive since the drastic reduction in maritime charter rates after 2015.³⁷

In this context, the question arises as to whether large-scale floating facilities are needed in the context of the oversupply of LNG and increasing competition. Partly due to the

Estonia may need to focus on providing support for floating bunkering centres, LNG uploading facilities for virtual pipelines in the ports and for LNG distribution centres both offshore and onshore

increasing availability of LNG supplies, the high level of investment in Klaipėda LNG terminal failed to reflect market demand. The high price for its LNG didn't attract demand for maritime bunkering facilities in Estonia and Latvia. This situation reveals that the inauguration of the floating LNG terminal didn't contribute to inter-Baltic cooperation in respect of the gas markets.³⁸

However, Klaipėda LNG terminal bunkers LNG in Eastern Baltic through a vessel Kairos

³⁷ The author of this report has addressed the issue of LNG market fragmentation in the past. See Andrei Belyi, "Transformation of the LNG market: the shift from large-scale to fragmented solutions," Global LNG Hub, 2016, <https://globallnghub.com/articles/transformation-of-the-lng-market-the-shift-from-large-scale-to-fragmented-solutions> (accessed 16 April 2019).

³⁸ Vija Pakalkaitė and Joshua Posaner, "The Baltics: Between Competition and Cooperation," in *New Political Economy of Energy in Europe*, ed. Jacob Godzimirski (London: Palgrave Macmillan, 2019).

operated by Babcock Schulte Energy.³⁹ In addition, Eesti Gaas has commissioned a small-scale bunkering barge that will operate in the Gulf of Finland. Floating bunkering services are increasing in Finland in addition to the newly operating import terminal in Hamina.⁴⁰ In this context, Estonia may need to focus on providing support for floating bunkering

centres, LNG uploading facilities for virtual pipelines in the ports and for LNG distribution centres both offshore and onshore. It could also be argued that flexible LNG infrastructure should be based around the Gulf of Finland, whereas the Estonian port of Paldiski located at juncture of the Baltic Connector offers a viable opportunity for a future LNG terminal.



Figure 6. LNG Facilities in the Baltic Sea⁴¹

³⁹ “LNG bunker vessel Kairos docks in Klaipeda,” *The Baltic Course*, 2 January 2019, <http://www.baltic-course.com/eng/transport/?doc=146220> (accessed 2 April 2019).

⁴⁰ For details, see “About Hamina LNG”, Hamina LNG Oy, <https://haminalng.fi/home/> (accessed on 19 April 2019).

⁴¹ Some projects foreseen by the GIE have never been implemented. Figure is based on Gas Infrastructure Europe (GIE), “LNG Map 2018: Existing and Planned Infrastructure,” Gas Infrastructure Europe, Brussels, 2018, https://www.gie.eu/download/maps/2017/GIE_LNG_2018_AO_1189x841_FULLL.pdf (accessed 22 April 2019).

These flexible solutions tend to reduce logistical costs rather than to increase expenditure on additional regasification or pipeline infrastructure. In this way, such solutions contrast strongly with the Klaipėda LNG terminal, which is characterised by burdensome operational costs. In the interests of market flexibility, which is likely to be even more important in the future than is presently the case, the availability and affordability of logistics for physical supply will be of crucial importance.

Flexible solutions tend to reduce logistical costs rather than to increase expenditure on additional regasification or pipeline infrastructure

In the context of the fast-growing LNG market, including both direct supply and decentralised supply by barges and virtual pipelines, penetration of the pipeline network is not always necessary. Taking into consideration these technological changes and flexible markets, LNG terminals should and will play an important role as entry points in the entry-exit system. This status would guarantee TPA to LNG terminals and diversify trading on the virtual platforms.

Estonia needs to develop logistical support for LNG with bunkering, facilities for upload for virtual pipelines and other forms of storage facility. Ports located on the Gulf of Finland can provide a competitive advantage for LNG supply to maritime transport, heavy road transport and other industrial sectors. Paldiski LNG at the landfall of the Baltic Connector – if commissioned by 2024 as planned – can also contribute as a significant entry point.

1.4. DEPENDENCE ON RUSSIAN GAS: IMPORTANCE OF ADHERENCE TO MARKET NORMS

Import dependence on Russian gas has for many years constituted the core concern for the Baltic states' energy security. Russia's ongoing monopoly over natural gas, in the form of Gazprom, is coupled with a poor reputation

gained in the aftermath of the gas transit conflicts with Ukraine in 2006 and 2009.⁴²

At the same time, industry stakeholders seem to prefer cheaper supply options regardless of origin.⁴³ One may argue that continued dependence on one supplier is at odds with the aims of the EU Energy Union and the national objectives of shaping a competitive and diversified gas market. It is clear that regional industrial stakeholders have diverging definitions of energy security risks and of costs related to energy diversification. In short, the following strategic conundrum remains valid:

Do industrial stakeholders underestimate the risks of dependence on one gas supplier or, on the other hand, do regional policymakers exaggerate

the Russian threat and underestimate the costs of gas diversification?

In order to provide an answer to these questions, it is necessary to review and assess the changes related to Russia's export diversification and the

Energy security is not linearly linked to energy independence but to a mode of governance of the energy markets

transformations that have occurred in respect of Gazprom's contractual practices in response to the antitrust monitoring carried out by the EU. This analysis tends to indicate that a significant step towards a market-based approach on the part of Russia and Russian companies will contribute to Baltic energy security. The reverse also holds true: market partitioning and the maintenance of an export monopoly constitute core concerns in relation to energy security. Consequently, energy security is not linearly linked to energy independence but to a *mode of governance* of the energy markets.

⁴² For further detail on the gas transit disputes, see Katya Yafimava, *The Transit Dimension of EU Energy Security: Russian Gas Transit Across Ukraine, Belarus, and Moldova* (Oxford: Oxford University Press, 2012).

⁴³ Marco Siddi, *Russia's Evolving Gas Relationship with the European Union: Trade surges despite political crises*, Briefing Paper 246 (Helsinki: Finnish Institute of International Affairs, 2018), https://www.fia.fi/wp-content/uploads/2018/09/bp246_eu_russia_gas_relations2.pdf (accessed 16 April 2019).

1.4.1. LNG EXPORT DEMONOPOLISATION

Since the collapse of the Soviet Union, Gazprom has had a de facto monopoly over gas exports. In 2006, Russia adopted its Gas Export Law, legally granting a gas export monopoly to Gazprom and its affiliates. However, in 2013, an amendment to the Gas Export Law was passed allowing some LNG exports. This amendment requires non-state-owned gas companies to have carried out ongoing liquefaction projects prior to 2013 and to possess a licence to extract natural gas in order to be eligible for an export licence in respect of LNG.⁴⁴ Accordingly, a private gas producer Novatek developed export capacities in Yamal, which became operational after the end of 2017. Furthermore, Novatek launched an LNG terminal in Vysotsk at the end of 2018, opening up further possibilities to supply LNG into the Baltic basin.

Although the new LNG export regulation seems somewhat restrictive, it opens up new scope for LNG exporters in Russia. In particular, small scale LNG producers may conclude agreements with GazExport (Gazprom's export department) to obtain an export licence or, in some cases, sell the commodity inside the Russian border and repurchase it after it crosses the border.

The availability of a competitive supply of small-scale LNG from Russia has become a reality and may certainly contribute to the development of the regional gas market

As a result, small LNG export facilities have emerged on the Russian side of Lake Peipsi. LNG volumes are supplied to Estonia across Lake Peipsi in limited volumes to Tallink, Alexela and JetGas. The availability of a competitive supply of small-scale LNG from Russia has become a reality and may certainly contribute to the development of the regional gas market.

1.4.2. EFFECTS OF THE EU ANTITRUST CASE AGAINST GAZPROM

In September 2012, at Lithuania's request, the Commission began a formal investigation into

Gazprom's contractual practices.⁴⁵ Up to 11 companies from Central and Eastern Europe were monitored by the Commission in the context of this investigation. The Commission took issue with three elements of Gazprom's practices as being potential breaches of EU law: market partitioning by means of destination clauses, erecting barriers to supply diversification by means of hoarding mechanisms in pipeline infrastructure, and unfair pricing on the basis of opaque oil indexation.

At the beginning of the antitrust monitoring process Russia explicitly refused to cooperate in relation to the case and Russia's president issued an executive order, in September 2012, forbidding strategic enterprises to cooperate with foreign authorities without domestic governmental approval.⁴⁶ Nevertheless, in 2017, the Russian side and Gazprom in particular issued a compromise proposal, or a 'commitment decision' in the terminology of the Commission. In response, the Commission issued a decision imposing binding obligations on Gazprom issued on April 2018 by which Gazprom needs to abide in order to comply with EU competition norms.⁴⁷

This decision aims, inter alia, to remove contractual barriers that impede the free flow of natural gas within the EU Member States by setting aside onward restrictions on gas resale. Gazprom has agreed to be flexible on delivery points: if, prior to the case, Russian gas was supplied to specific delivery points (e.g. Kotlovka for the Baltic region), delivery points can now be changed if the

⁴⁵ Cf European Union, European Commission, "Upstream gas supplies in Central and Eastern Europe", European Commission, Anti-Trust and Cartel Cases, Case AT.39816, http://ec.europa.eu/competition/elojade/isef/case_details.cfm?proc_code=1_39816 (accessed 19 April 2019).

⁴⁶ Russian Federation, President, "Ukaz Prezidenta Rossiyskoy Federatsii ot 11.09.2012 g. N 1285 o merah po zashchite interesov Rossiyskoy Federatsii pri osushchestvlenii rossiyskimi yuridicheskimi litsami vneshneekonomicheskoy deyatel'nosti" (Executive Order of the President of the Russian Federation No 1285 on 11 September 2012 regarding the measures protecting the interests of the Russian Federation in conducting the external economic activity by Russia's legal entities), President of the Russian Federation, 12 September 2012, <http://kremlin.ru/acts/bank/36031> (accessed 21 April 2019).

⁴⁷ European Union, European Commission, "Decision relating to a proceeding under Article 102 of the Treaty on the Functioning of the European Union (TFEU) and Article 54 of the EEA Agreement," European Commission, Anti-Trust and Cartel Cases, Case AT.39816 – Upstream Gas Supplies in Central and Eastern Europe, http://ec.europa.eu/competition/antitrust/cases/dec_docs/39816/39816_10148_3.pdf (accessed 19 April 2019).

⁴⁴ On Russia's gas export policies, see James Henderson and Arild Moe, "Russia's gas 'Triopoly': implications of a changing gas sector structure," *Eurasian Geography and Economics*, Vol 58 (4), 2017: 442-468.

market so requires.⁴⁸ As a result, destination clauses are effectively removed from Gazprom's contracts with Central and Eastern European states.

In its compromise proposal, Gazprom committed not to impede initiatives aimed at gas market diversification including access to pipeline networks on the part of independent gas suppliers in the region. Furthermore, EU energy legislation will apply in place of bilateral agreements between Gazprom and pipeline network companies.

Gazprom's commitment on pricing is related to the connection of the gas markets with more liquid European hubs, such as TTF or Gaspool. In this regard, the gradual integration of the hub price into Gazprom's pricing practices should also be noted independently from the anti-trust case.

1.4.3. PRICING PRACTICES: EU HUBS ARE PRICE MAKERS

It is worth bearing in mind that in the early development of cross-border gas flows, transactions occurred between vertically integrated national companies that supplied natural gas under long-term agreements. While the producers committed themselves to long-term supply, consumer companies agreed to pay for a fixed volume of gas, usually around 85% of the contracted volumes, in order to secure a long-term supply regardless of short-term fluctuations in demand. Long-term commitments on the part of consumers also imply that gas should be more competitive than alternative fuels. To simplify the scheme, consumers agree to be bound to long-term gas contracts only if the price of the gas was lower than that of oil. Given that since the 1960s gas has competed with oil in relation to heating and electricity generation, formulas linked to the oil price have been developed.⁴⁹

Nevertheless, with the development of natural gas hubs, gas-to-gas competition has evolved and is characterised by a price dynamic distinct from that applicable to oil and oil products.

The availability of a competitive supply of small-scale LNG from Russia has become a reality and may certainly contribute to the development of the regional gas market

Furthermore, oil the demand for oil product for electricity generation has diminished. Consequently, the economic relevance of gas-to-oil indexation has been open to question since the beginning of the new century. Initially, Gazprom strongly advocated oil price indexation.⁵⁰ As a result, gas traded in the NBP, Gaspool and TTF hubs followed a different price dynamic from the traditional long-term contracts concluded with external suppliers, including Gazprom. The mismatch between the two even gave rise to significant differences in gas prices, especially during the oil price hike in 2012-2014, accompanied by an oversupply of natural gas in the hubs during the same period (Figure 7). Meanwhile, Gazprom's traders participated in hub-based trade and, paradoxically, created competition between Russian gas sold by different traders on the European markets.

However, 2015 saw a sharp decline in the oil price that led to a decline in the gas price charged by Gazprom. This made the issue of oil indexation less relevant and the gas price less politicised, as a result of which Gazprom lost interest in arguing in favour of oil indexation in gas supply contracts.⁵¹ Hence, Gazprom's shift away from oil indexation reflects a general trend observed on the European gas markets.

⁴⁸ Jonathan Stern and Katya Yafimava, "The EU Competition investigation of Gazprom's sales in Central and Eastern Europe," Working Paper, Oxford Institute for Energy Studies, July 2017, <https://www.oxfordenergy.org/wpcms/wp-content/uploads/2017/07/The-EU-Competition-investigation-of-Gazproms-sales-in-central-and-eastern-Europe-a-detailed-analysis-of-the-commitments-and-the-way-forward-NG-121.pdf> (accessed 2 April 2019).

⁴⁹ Energy Charter Secretariat, *Putting a Price on Energy*.

⁵⁰ Opinion expressed by a vice director of Gazprom Export, Serguei Komlev, at the workshop of the Energy Charter Secretariat, 16 May 2014.

⁵¹ Andrei Belyi and Andreas Goldthau, "Between a rock and a hard place."

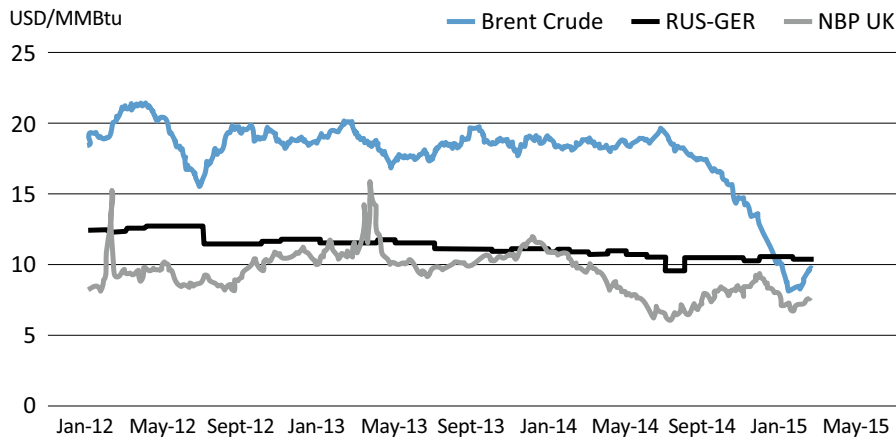


Figure 7. Dynamics of Oil Price, Oil Indexed Gas Price and Gas Hub, 2012-2015⁵²

The situation with price dynamics indicates the importance of competitive contracts and market liquidity. Long-term contracts often lock buyers into a price range, as has been observed in respect of both Gazprom’s market partitioning and Klaipėda LNG arrangements with Statoil (Equinor). By contrast, gas hubs with high liquidity allow for long-term arrangements together with competing futures and spot contracts. Likewise, Russian supplies from Vysotsk are now being offered with a significant discount even for short and mid-term agreements.⁵³

Taking into account the evolution of Russian exports and the Commission’s decision in respect of Gazprom, together with the latter’s commitment, we can assert that the Russian gas supply structure has become more competitive and diverse. However, the risk of market partitioning should be monitored at Estonian domestic level on the basis of the inverse vertical integration of the supply structure.

⁵² Adapted from East European Gas Analysis 2015 in Andrei Belyi and Andreas Goldthau, “Between a rock and a hard place: International market dynamics, domestic politics and Gazprom’s strategy,” EUI Working Papers, RSCAS 2015/22, April 2015, http://cadmus.eui.eu/bitstream/handle/1814/35398/RSCAS_2015_22.pdf (accessed 19 April 2019).

⁵³ The author’s observation based on direct contacts with LNG suppliers and energy companies in Estonia and Latvia.

2. GAS AND THE ENERGY TRANSITION

As indicated in the EU's Energy Union goals, Baltic energy security cannot be delinked from the EU's environmental objectives. Furthermore, every Member State has adopted the National Energy and Climate Plan for the period between 2021 and 2030 in order to fulfil the Energy Union's sustainability goals. Final drafts of the National Energy and Climate Plans need to be submitted by the end of 2019.

Baltic energy security cannot be delinked from the EU's environmental objectives

Estonia provided a draft of its National Energy and Climate Plan, which contains a detailed explanation of its current achievements in increasing energy efficiency and diversification by fuel.⁵⁴ The country has set itself the target that, by 2030, 50% of its primary energy supply will be met using renewable energy sources. The draft remains rather broadly worded as to the specific mechanisms to support the carbon-free economy, and a large part of the text reiterates existing policy priorities concerning interconnections, energy self-sufficiency and energy efficiency. Furthermore, the text refers to the Estonian Energy Industries Union's request to 'specify the benchmarks for the share of renewable electricity, information on the renewable energy utilisation objectives in the transport sector, the power capacity of combined power and heat plants [...] and information concerning the objectives of diversification of gas supply that take into account the production of biogas/biomethane in Estonia'. This request reveals a need for strategic discussion over the choices to be made between different energy sources in the light of the implementation of the EU Energy Union goals.

The energy transition is not only about targets but also about devising a cost-effective path to achieving them

Indeed, the energy transition is not only about targets but also about devising a cost-effective path to achieving them. Since fossil

⁵⁴ Republic of Estonia, *National Energy and Climate Plan*.

fuels continue to present a cost advantage, the energy transition to a carbon-free economy may become a lengthy and costly process. In the energy transition towards low-carbon solutions, natural gas – deemed the 'cleanest' fossil fuel – has been widely accepted as the most competitive option.⁵⁵

Nevertheless, in recent years, the transition from fossil fuels focused on a need for the rapid electrification of all economic sectors. Electric vehicles should replace internal combustion vehicles, the electricity share should increase in industry and heating, and electricity should be generated from carbon-free sources. However, the costs of these options remain unclear and are often poorly assessed.

Certain issues affecting the strategic choices to be made by Estonia in relation to the gas markets may be highlighted:

- Energy security is not about self-sufficiency but about logistics and inter-fuel competition.
- Stimulating gas demand is more viable than the emphasis on electrification.
- Making the natural gas 'green' by promoting biomethane is the viable option in terms of sustainability objectives.

In order for the National Energy and Climate Plan to have greater political significance, stronger emphasis must be laid on energy matters within Estonia's political framework. The creation of a position of energy minister or even of a separate energy ministry would give the implementation agenda greater political weight. Moreover, this would make it easier to communicate Estonia's political positions in the context of European Council discussions on energy issues and would help advance national energy interests internationally.

2.1. SELF-SUFFICIENCY AND INTER-FUEL COMPETITION

The draft National Energy and Climate Plan relates its objectives to the Energy Union targets summarised in section 1.1.1 of this report. It seems, however, that the

⁵⁵ For an economic analysis of fuel acceptance, see Sarah Pfoser, Oliver Schauer, and Yasel Costa, "Acceptance of LNG as an alternative fuel: Determinants and policy implications," *Energy Policy*, Vol. 120 (4), 2018: 259-267.

National Energy and Climate Plan misplaces the energy security priorities by relating them primarily to the self-sufficiency agenda. It is worth noting that self-sufficiency is not in itself one of the goals of the Energy Union. The reason for this is that the European institutions focus overwhelmingly on diversification rather than self-sufficiency.

It may be necessary to clarify the definitions of energy security and energy diversification in order to avoid any confusion between the two.

Self-sufficiency is no guarantee against regulatory mismanagement or against a resulting energy deficit

2.1.1. ENERGY SECURITY AS SELF-SUFFICIENCY: MISPLACED FOCUS?

A number of studies on the definition of energy security indicate a non-linear link between energy self-sufficiency and a more secure energy structure.⁵⁶ It can also be demonstrated empirically that self-sufficiency is no guarantee against regulatory mismanagement or against a resulting energy deficit.

Energy security is about the reliability of external suppliers and resilience to international shocks, including supply and price shocks

Instead, energy security is about the reliability of external suppliers and resilience to international shocks, including supply and price shocks. Bearing in mind the need for gas security, the emphasis should be on the logistical solutions available to market participants. These include the availability of LNG bunkering and storage facilities, access to UGS, the availability of alternative energy supply sources and virtual pipelines capable

⁵⁶ A large part of the report 'Policies of Natural Resources – POLINARES' funded by the European Commission Framework Programme VII 2007-2012 was dedicated to assessing various dimensions of energy security. The report was cited liberally in Andrei Belyi, *Transnational Gas Markets and Euro-Russian Energy Relations* (London: Palgrave Macmillan, 2015), and a similar conception of energy security as being delinked from dependence was advocated in Roland Dannreuther, *Energy Security* (Cambridge: Polity Press, 2017).

either of shipping gas to off-grid regions or even replacing gas pipelines in emergency situations.

A comparison between Austria and Bulgaria during the gas supply crisis of January 2009 serves to illustrate this argument. When the gas shock – which was caused by cessation of the gas supply and transit from Russia via Ukraine – occurred, both countries were entirely dependent on the Russia-Ukraine route for their gas supplies. Austria suffered minimal inconvenience since the country could utilise its UGS (run by RAG Austria AG) and interconnections with Germany. By contrast, Bulgaria experienced complete isolation from supplies, which even led to loss of human life.⁵⁷

Likewise, the link between security and markets may need to be emphasised. As demonstrated in the first part of the report, markets create positive conditions for the diversification of gas supplies and for competitive pricing. In this context, the National Energy and Climate Plan should place more explicit emphasis on the development of gas demand in order to back the markets.

2.1.2. INTER-FUEL COMPETITION AND SECURITY: WHY IT MATTERS

In formulating energy security strategy it should be taken into account that inter-fuel competition reduces the need for capital intensive self-sufficiency. Dependence on one incumbent gas supplier may engender

various risks, from technical disruptions to political conflicts. Nevertheless, one may also take into consideration that gas extraction, production and transmission are capital-

In formulating energy security strategy it should be taken into account that inter-fuel competition reduces the need for capital intensive self-sufficiency

intensive segments of the industry for the incumbent. The constant development of new fields and higher performance technologies to

⁵⁷ Miguel Martinez, Martin Paletar, and Harald Hecking, *The 2014 Ukrainian Crisis: Europe's increased security position* (Cologne: Institute of Energy Economics (EWI), 2015).

optimise the extraction of natural gas is needed to ensure that the required volumes are supplied to the markets. Most of the costs involved in the gas supply chain are incurred in transmission, which requires the operation of gas compressor stations to stream and adjust volumes of natural gas. Compressor stations require energy input in the form of what is known as technical gas. As a result, the marginal costs of the natural gas industry can be illustrated by a J-curve: marginal costs first decline, stabilise and then tend to constantly rise.

Inter-fuel competition is an important factor in the energy supply chain. This means that an economy of scale in respect of new fuels tends to lead to decreases in costs and hence the costs of inter-fuel competition show a slow downwards trend.

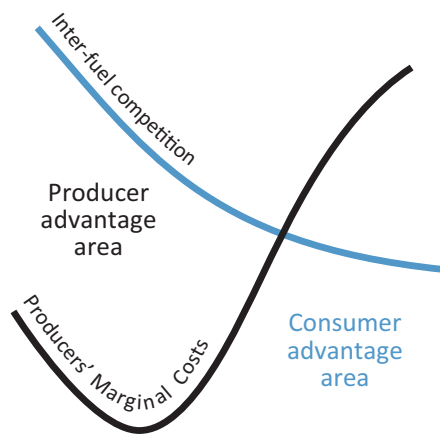


Figure 8. Effects of Inter-Fuel Competition

As a result, when inter-fuel competition costs are high and the incumbent’s marginal costs are low, the incumbent may exert a market advantage. Conversely, when the incumbent’s costs rise and inter-fuel costs decline, a buyer-oriented market emerges.

Consequently, inter-fuel competition helps to create a buyer-oriented market. In turn, incumbent gas suppliers tend to secure their markets by reducing costs where possible. At the same time, if the incumbent decides to cut gas supplies, the costs involved in operating compressor stations rise because gas volumes need to be drastically reduced and compressed while increasing internal consumption of technical gas. Consequently, gas is consumed by the compressor stations without any market outcome in respect of the volumes produced.

Therefore, cutting gas supplies constitutes a heavy financial burden for any gas supplier. In the context of a buyers’ market, the missing gas can be easily replaced, or gas demand can be replaced by other fuels, especially in relation to electricity generation.

2.1.3. WILLINGNESS TO PAY AND ENERGY SECURITY: OPPOSITE CURVES

Any additional infrastructure aiming at inter-fuel competition involves higher costs, which will be passed to the consumers either directly (through a higher gas price) or indirectly (through taxation and wealth distribution). At this juncture, it is worth calling to mind the institutional concept of willingness to pay (WTP). WTP reflects three main variables: (1) the value of the public good to be achieved (security of gas supply in this case); (2) the ability of the society (state, company, individuals) to cover the costs; and (3) the cost of the public good. In accordance with this scheme, the higher costs for security can generate a decline in the WTP for the new infrastructure.

This relationship is schematised in Figure 9, which illustrates the constant need to find a balance between the need for security and WTP.

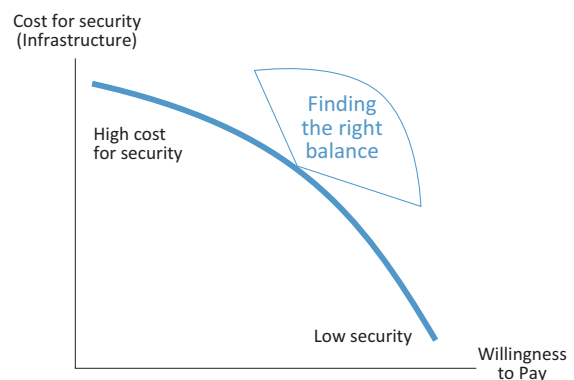


Figure 9. WTP and Energy Security

Figure 9 demonstrates that the cost of energy independence and self-sufficiency can be too high for an adequate level of WTP. At the same time, the market logic also helps to reduce political incentives to overinvest in capital-intensive infrastructure in areas of low demand for capacity.

Overinvestment in infrastructure has various detrimental effects. For example, additional investment costs are often passed to consumers

and make the gas market less competitive. Consequently, the logic of the market helps to achieve a balance between security needs relating to infrastructure and the WTP on the part of market stakeholders. Moreover,

Overinvestment in infrastructure has various detrimental effects. For example, additional investment costs are often passed to consumers and make the gas market less competitive

additional infrastructure (e.g. interconnections, storage, regasification etc.) reinforces the carbon lock-in effect, which can raise greenhouse gas emissions.

Ideally, market-driven mechanisms help to achieve broader policy goals at lesser cost, and thus with a higher WTP.

The Estonian National Energy and Climate Plan may need to concretise the energy security measures that are to be taken whereas self-sufficiency should not be taken as the sine qua non solution to the issue. The optimal way to guarantee security of supply at lower cost is to create flexible logistics for LNG supplies.

2.2. STIMULATING GAS DEMAND AS THE CORE CHALLENGE

Stagnation in gas demand has been observed across Europe for more than a decade. Furthermore, most European countries experienced a decline in demand for gas from 2011 to 2014. In the aftermath of the price fall in 2014-15, demand for gas revived but did not achieve the growth rates seen in the early 2000s.

There is a need for incremental growth in gas demand at national level, particularly in Estonia's power generation sector, and direct usage of gas should increase both in road and maritime transport

Gas constitutes less than 10% of Estonia's primary energy supply and its gas demand is the lowest of the three Baltic states. Therefore, there is a need for incremental growth in

gas demand at national level, particularly in Estonia's power generation sector, and direct usage of gas should increase both in road and maritime transport. Consequently, Estonia has an opportunity to reverse the general trend towards gas demand stagnation and reinforce gas consumption in its domestic economic sectors. Nevertheless, it is easier to achieve such incremental growth if this becomes a political priority. The focus on traditional fossil fuels as well as attempts to introduce full-scale electrification of the economy may not favour incremental demand growth. Furthermore, these policy choices have significant political and economic consequences.

2.2.1. IMPORTED ELECTRICITY INSTEAD OF A LOCAL GAS MARKET?

Implementation of the EU's environmental objectives emphasises the need to shift from fossil fuels and to increase the demand for electricity in national economies. In the light of these objectives, a recent report, 'Baltic Energy Technology Scenarios,' stresses the difficulties involved in making decentralised renewable energies sufficiently competitive in the Baltic states, and political support for state-support mechanisms remains low. In conclusion, the report indicates that increasing electricity consumption in the region would be a step towards decarbonisation. The report also suggests 'incentives to locate renewable energy generators in the Nordic countries, which provides plentiful resources and good political framework conditions, allowing net export of clean electricity to the rest of Europe, including the Baltic countries'.⁵⁸

In other words, the report seems to suggest not only closing down national generation capacity (which would have a serious social impact as well), but also increasing imports of electricity to the Baltic states from one of the most expensive areas of the power market.

⁵⁸ Tomi J. Lindroos, Antti Lehtilä, Tiina Koljonen, Anders Kofeod-Wiuff, János Hethey, Nina Dupont, and Aisma Vītiņa, *Baltic Energy Technology Scenarios 2018* (Copenhagen: Nordic Council of Ministers, 2018), <http://norden.diva-portal.org/smash/get/diva2:1195548/FULLTEXT01.pdf> (accessed 16 April 2019).

Even though both Estonia and Latvia are part of the Nord Pool market, and free electricity trade exists between the Baltic and the Nordic states, the proposal seems to be largely divorced from national economic realities. Currently, Estonia has significant generation surplus and therefore a switch from national generation to expensive imports would be economically disadvantageous and give rise to political opposition. In addition,

extensive wind energy and biomass production are issues that need to be addressed.

Natural gas remains the best and most competitive solution available for the energy transition both for electricity and transport. Special attention should be given to both.

2.2.2. GAS DEMAND IN ELECTRICITY

Increasing electricity consumption by at least 8 TWh per annum – doubling the existing electricity demand – will create a significant energy supply deficit

increasing electricity consumption by at least 8 TWh per annum – doubling the existing electricity demand – will create a significant energy supply deficit. This perspective opens a further political debate for Estonia: whether it should retain the advantages of its present generation capacity surplus or opt for a capacity deficit instead?

The issue of energy transition costs arises when addressing this question of policy priorities. Given the rising costs involved in the energy transition, there is a risk that WTP for environmentally friendly policies will decline and have an adverse political effect on the climate policy commitments. This has already been noticed with the rise of political movements denying climate change as an issue and further undermining European liberal values in general.

The substitution of national electricity generation by imports of power from Nordic countries is not only an expensive option but one the environmental benefits of which are unclear. Nordic markets, particularly Finland, contains a share of Russian nuclear energy that

does not have environmental and safety costs factored into its price. Instead, a fuel shift from shale oil to natural gas may represent a viable solution in terms of reducing greenhouse gas emissions and may be a more competitive option than renewable energies. Furthermore,

A fuel shift from shale oil to natural gas may represent a viable solution in terms of reducing greenhouse gas emissions and may be a more competitive option than renewable energies

higher demand for gas ensures better energy security since the existence of a demand attracts new suppliers and traders seeking to penetrate the market.

It remains controversial that electrification is a solution for climate change mitigation per se even with renewable energy electricity generation

It remains controversial that electrification is a solution for climate change mitigation per se even with renewable energy electricity generation. The indirect environmental effects of renewable energy solutions – especially of the widely popular photovoltaic energy – should not be ignored. Among other things, waste management in relation to used photovoltaic panels and unsustainable forestry policies provoked by the large-scale land-use needed for

National electricity generation represents a potential for an incremental gas demand stemming from the shift from oil shale to natural gas in power plants. Electricity generation constitutes an unexplored area for gas demand. The use of natural gas in combined cycles for power and heat generation allows for flexible adaptation to the market. For instance, electricity output can easily be increased or decreased as required. Therefore, gas-based power generation offers the best opportunity for adaptation to the market and represents an advantage where most renewable energy sources represent a problem.

On this issue, the Lithuanian government has announced a feasibility study for new gas-fired

generation capacity.⁵⁹ It has also stated that Lithuania does not exclude the possibility of providing state aid for power plant development in case of need. If power generators are required to pay a ‘security fee’ for Klaipėda LNG supplies, Lithuanian suppliers that provide gas-generated power either run the risk of having to provide more expensive electricity or contributing to an imbalance in the regional electricity market due to state aid structures.

It can easily be argued that the development of gas power plants in Estonia is a rational alternative to increasing the generation capacity deficit. The core challenge in respect of the demand for gas in the power sector lies in addressing the mismatch between seasonal cycles for gas demand and intra-day cycles for power demand. In this context, the entry-exit zone created with Latvia and Finland constitutes an opportunity to achieve the correct balance.

It can easily be argued that the development of gas power plants in Estonia is a rational alternative to increasing the generation capacity deficit

In order to achieve a deliver a short-term increase for power generation, gas can be delivered either from the Latvian UGS on a seasonal basis or by LNG virtual pipelines on daily basis.⁶⁰ Therefore, the newly established entry-exit zone and flexible physical supplies can contribute to demand for gas-fired electricity and address short-term volatility in the electricity price. Furthermore, a more liquid virtual platform and market mechanisms for spot and futures contracts will allow power generators to find an optimal intra-day gas price.

Significantly, the availability of a natural gas supply also ensures a back-up for renewable energy generation. It is widely known that power generation from renewable sources, such as solar and wind, is limited by weather-based intermittenencies. For example, the

⁵⁹ Republic of Lithuania, Ministry of Energy, “Agreement signed on a feasibility study for the electricity generation project,” Ministry of Energy, 15 March 2019, <http://enmin.lrv.lt/en/news/agreement-signed-on-a-feasibility-study-for-the-electricity-generation-project> (accessed 16 April 2019).

⁶⁰ Where LNG is delivered via virtual pipelines, it is regasified on spot using onsite facilities.

absence of sunlight decreases solar power capacity and the absence of wind curtails wind energy generation. By contrast, natural gas power generation offers flexible adaptation of energy output. In the context of a flexible gas market and physical delivery, gas can be made available at any point of time.

The second area for incremental gas demand relies on the direct use of gas in transport. Gas can be used in transport either in the form of CNG or LNG

2.2.3. GAS IN TRANSPORT

The second area for incremental gas demand relies on the direct use of gas in transport. Gas can be used in transport either in the form of CNG or LNG. CNG solutions are less expensive since the compression does not require a liquefaction process. However, liquefaction implies that the methane undergoes a purification process and therefore LNG fuel is often preferred, even over CNG, for engines. The potential of both CNG and LNG can be increased by using virtual pipelines to bring it to any off-grid area. Estonian CNG distribution companies have indicated that the Estonian CNG market is already competitive and is set to gradually increase in scale (see Table 3).

Table 3. Estonia’s National CNG Consumption⁶¹

Year	National CNG Consumption in GWh
2018	90 GWh
2019	140 GWh
2020-25 (forecast)	340 GWh

The direct use of LNG as a cryogenic fuel for transport has great potential because the gas is purified during the liquefaction process, which makes it a more interesting option for engines. The maritime sector represents an important area for incremental gas demand in respect of LNG use. The maritime sector is responsible for almost 5% of EU-wide emissions and a switch from fuel oil to LNG may reduce emissions by at least 35% to 40% and would stop sulphur

⁶¹ Data provided by Alexela Group in e-mail communication with the author, 17 April 2019.

emissions.⁶² Furthermore, the development of biomethane may create a basis for sustainable gas-based transport with a number of advantages in terms of cost-effectiveness and environmental impact.⁶³

However, the possibility of obtaining cheaper heavy fuels on the markets remains despite the environmental hazards caused by traditional hydrocarbons. Consequently, regulatory mechanisms are needed at state level in order to reduce the availability of heavy fuels and further stimulate the demand for natural gas. The promotion of new uses of gas in transport requires the adoption of restrictive measures in respect of heavier fossil fuels.

In order to achieve a competitive gas market, Estonia needs to further stimulate gas demand in the power sector and in transport. The National Energy and Climate Plan may need to emphasise the development of new uses of gas, comprising CNG and LNG. In particular, exemption from excise duties – or other stimulation mechanisms such as road tax exemption – to promote conversion to CNG and LNG from heavy fuels in transport may be required.

2.3. GAS, METHANE EMISSIONS AND BIOGAS

The emphasis on natural gas is criticised by experts who argue that it does not offer a long-term means of reducing greenhouse gas emissions. Some experts cite the pernicious effects of the methane emissions that stem from gas transportation, liquefaction processes and LNG bunkering.⁶⁴ Although industry experts

⁶² Estimates provided in Christopher Le Fevre, Mike Madden and Nick White, *LNG in Transportation* (Rueil Malmaison: CEDIGAZ, 2014).

⁶³ Experience in the UK in respect of the use of biomethane in transport can be taken into consideration. See Celine Cluzel and Sophie Lyons, *Independent Assessment of the Benefits of Supplying Gas for Road Transport from the Local Transmission System: Technical Summary Report* (Element Energy Ltd, July 2017), <https://cadentgas.com/getattachment/About-us/Innovation/Projects/Revolutionising-Transport/Promo-Full-report/Element-Energy-Monitoring-of-Leyland-station-final-summary.pdf> (accessed 16 April 2019).

⁶⁴ Judith Bates, *Biomethane for Transport from Landfill and Anaerobic Digestion: Report for the UK Department of Transport* (Harwell, Didcot: Ricardo-AEA Ltd, 2015), https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/416002/biomethane-for-transport.pdf (accessed on 23 September 2018).

note that methane emissions occur only rarely, the issue may represent an important barrier to fostering a positive and green image for natural gas. In this context, a mix of biogas with natural gas is needed in order to reduce the methane emissions footprint from the natural gas infrastructure. In this regard, emphasis should be placed on the usage of biogas and biomethane. In addition, the policy debate over the competition between biomethane and electric vehicles needs to be taken into account.

A mix of biogas with natural gas is needed in order to reduce the methane emissions footprint from the natural gas infrastructure

2.3.1. BIOGAS AND BIOMETHANE IN ESTONIA

In Estonia, potential raw materials for biogas include biodegradable waste from landfills, food production companies, as well as waste from livestock farms, gardens and parks.⁶⁵ The most important advantage of biogas production is the creation of a circular economy schematised as follows: economic activities produce waste → waste is transformed into biogas → biogas is transformed into energy → energy is used for economic activities.

Biogas itself does not have a strong energy value because it represents a mixture of various gases including biomethane. Its use is limited to very local applications (e.g. small gas stoves) but it is not possible to mix it with natural gas. Thus, biogas needs to be upgraded to biomethane by a specific process in order to produce an economically viable commodity. Unlike biogas, biomethane can be injected into a pipeline or used as CNG in engines.

The International Energy Agency (IEA) has recently conducted a comprehensive study on biomass potential in Estonia. In accordance with the IEA analysis, the share of biogas remains

⁶⁵ Kristjan Piirimäe, Viktorija Blonskaja, and Enn Loigu, "Spatial Planning of Biogas Stations in Estonia," 9th International Conference Environmental Engineering, Vilnius, Lithuania, 22-23 May 2014: 1–6.

underdeveloped given its physical potential.⁶⁶ However, the penetration of biomethane into the transport sector is gathering pace. By 2018, up to 40% of the 90 GWh of CNG sold in Estonia originated from biomethane. Estimates for 2019 indicate that biomethane usage is increasing in step with the CNG market. The CNG market is expected to hit a ceiling of 140 GWh, while biomethane's market share will probably remain at 40%.⁶⁷ Meanwhile, three additional development projects for biomethane production are now ongoing in addition to the existing two plants.

Since biogas production is an expensive solution, the best way to integrate it into the national economic structure would involve the use of permit-based solutions whereby a biogas producer would conclude an agreement with a gas supplier in order to integrate the biogas solution into the trading scheme. In this way, the biogas would not be physically mixed with the natural gas supplied by the gas supplier but integrated into the supply contract. Estonia opted for the direct injection of biomethane into CNG solutions. However, it may still be worth considering permit-based schemes when these are economically relevant, especially for biogas share integration into the LNG markets.

Beyond CNG market, a more detailed analysis should be conducted in order to assess the available mechanisms by which biogas may be integrated into LNG-fuelled maritime transport, which will be the most significant segment of LNG demand in the region.

2.3.2. BIOMETHANE VERSUS ELECTRICITY IN TRANSPORT

In recent years, the promotion of the use of CNG and LNG in transport has often been criticised by supporters of wide electrification of economic activities. This debate has also played out in Estonia since state-owned electricity distribution system operator Elektrilevi announced plans to

develop a wider network of electricity charging stations for electric vehicles, which leads one to question the support provided for biomethane development in Estonia.

Carbon-free electricity power generation can, hypothetically, be used to provide electricity to the charging stations and in this way reduce the need for biogas in transport. The Secretary General of Eurelectric (the European Association of Electricity Companies) recently suggested that electric vehicles should be one of the core priorities in implementing the EU's environmental targets. He estimated that up to 200 million electric vehicles will come onto the European markets by 2050.⁶⁸ In addition, a large study conducted by an association of experts called 'Mission Possible' indirectly supports his argument and indicates that the shift to electricity in transport will come at a low cost.⁶⁹

However, the Mission Possible study does not address the issue of costs in great depth. The study broadly states that biomethane solutions are more expensive than fossil fuels but remain silent about the economic and social incremental benefits stemming from supporting circular economy (eg. waste management and recycling). Moreover, the study underestimates the cost and difficulties involved in developing the network of charging stations to facilitate road transport electrification and the additional pressure this will bring to bear on the overall energy system. In the event that a large number of electric vehicles are being charged at the same time, the risk of frequent short-term blackouts may be very real. It also seems that no extensive study has been carried out on the subject of electricity flows management in the context of road transport electrification.

Finally, the promotion of electric vehicles involves controversial debates over the environmental impacts of lithium and cobalt production. In fact, the production of batteries requires lithium, which is mostly produced in South America. Its production affects the local ecological landscape, including forests,

⁶⁶ Luc Pelkmans, Liisa Ruuder, *IEA Bioenergy Country Reports: Estonia – 2018. Bioenergy policies and status of implementation* (Paris: International Energy Agency, 2018), https://www.ieabioenergy.com/wp-content/uploads/2018/10/CountryReport2018_Estonia_final.pdf (accessed 22 April 2019).

⁶⁷ Data collected via direct communication with Estonia's CNG suppliers.

⁶⁸ Kristian Ruby, "Decarbonization pathways in European Power Sector & Economy," presentation, Riga Energy Forum, Riga, Latvia, 7 March 2019.

⁶⁹ Energy Transitions Commission, *Mission Possible: Reaching Net-Zero Carbon Emissions From Harder-To-Abate Sectors by Mid-Century* (London: Energy Transitions Commission, 2018), http://www.energy-transitions.org/sites/default/files/ETC_MissionPossible_FullReport.pdf (accessed 19 April 2019).

and therefore indirectly contributes to climate change. Cobalt production is concentrated in the Democratic Republic of Congo, where acute environmental and social issues have also been observed, together with the high political risks associated with mining in this country. Paradoxically, the Mission Possible study fails to bring out these controversial points despite its primary emphasis on the need to ensure sustainable development by means of electrification.

Unlike electrical vehicles, biomethane offers an environmentally friendly and economically proven option. On these grounds, it seems

that gas-driven transition should not be underestimated or be given lesser priority than electrification objectives in respect of road transport.

The promotion of biomethane-based CNG has to be prioritised because it represents a proven market-based solution. Biomethane should accordingly constitute a large part of the renewable energy objectives declared in the National Energy and Climate Plan. The promotion of biomethane in road transport should be more important than policies supporting charging stations and electric vehicles.

3. REGIONAL GAS MARKETS AND GEOPOLITICS

Energy security in the Baltic region is highly dependent on international political developments. In-depth study of the gas markets and geopolitics indicates that risks do not stem solely from the availability of gas supplies or from inadequacies in infrastructure.

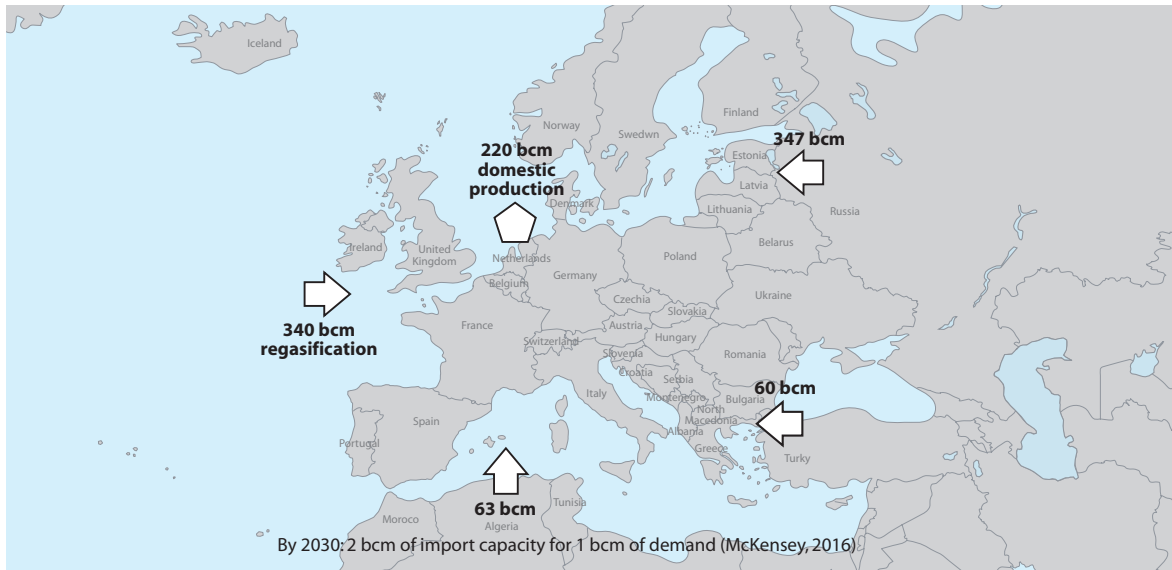


Figure 10. Gas Infrastructure Outlook⁷⁰

The geopolitical dimension of energy beyond the energy markets per se should also be taken into account. The nature of the dynamics of supply and demand in respect of gas together with technological and market innovations in the energy industries tend to point to a reduced risk of gas supply shortages, price rises and insufficient import infrastructure.

could lead to overinvestment in infrastructure. Energy markets constitute a secondary factor dependent on wider political tensions, conflicts, and the weaponisation of economic relations.⁷¹

In this regard, the political risks for Baltic energy security may include a broad range of developments, such as increasing tensions between Russia and the West, transatlantic frictions and the weakening of European political integration.

Geopolitical tensions may affect gas supply costs, have a disincentivising effect in relation to natural gas demand dynamics and generate perceived security threats that could lead to overinvestment in infrastructure

3.1. EU-RUSSIA ENERGY RELATIONS: CLASSIFYING RISKS

Relations with Russia lie at the heart of concerns over Baltic energy security, mostly because of gas market interdependence. Russia remains the main supplier to the EU, while Europe remains the main market for Russian gas. Interdependence is not a *sine qua non* guarantee of the absence of conflict

However, geopolitical tensions may affect gas supply costs, have a disincentivising effect in relation to natural gas demand dynamics and generate perceived security threats that

⁷⁰ From McKinsey and Company, *Energy Insights: Global Gas Outlook to 2035* (McKinsey & Company, 2019), <https://www.mckinsey.com/solutions/energy-insights/global-gas-lng-outlook-to-2035> (accessed 22 April 2019).

⁷¹ This theme is developed in Belyi, *Transnational Gas Markets*.

and may be either positive or negative. States tend to increase cooperation where positive interdependence holds sway, but seek to escape mutual dependencies where there is negative interdependence.

Relations with Russia lie at the heart of concerns over Baltic energy security, mostly because of gas market interdependence

It has been argued in various policy documents and scholarly works, and appears to be borne out by the facts on the ground, that EU-Russia energy relations have changed from a situation of positive interdependence to one of negative interdependence.⁷² In the current political context, especially with regard to the ongoing conflict in Ukraine and the resulting sanctions imposed on Russia, there is a risk that such negative interdependence will continue. For instance, since negative interdependence evolved, it has become consistently difficult either to attract investors to energy projects involving Gazprom or to ensure low-risk assessment of credit line of projects where Gazprom is the sole supplier. Thus, the issue of positive versus negative interdependence has real consequences and is not merely a matter of academic conceptualisation.

In this context, two issues of negative interdependence between the EU and Russia need to be addressed: the risk of supply disruptions and the deinstitutionalisation of energy relations.

3.1.1. RISKS OF GAS FLOW DISRUPTIONS

In the context of the growing negative interdependence a legitimate question may arise as to the risk of Estonia's direct gas supply being cut. Answering this question generally results in unnecessary fortune-telling since many of the political developments that have taken place in Russia's foreign policy were not accurately predicted. However, given Russia's experience of gas supply and transit conflicts with Ukraine, similar supply interruptions seem unlikely in relation to the Baltic states in the current context. First, gas supply

⁷² For a literature review on the subject, see Irina Kustova, "EU-Russia Energy Relations, EU Energy Integration, and Energy Security: the State of the Art and a Roadmap for Future Research," *Journal of Contemporary European Research*, Vol 11 (3), 2015: 288-295.

interruptions are expensive for the gas supplier. In order to persist with a gas flow interruption, compressor stations must operate at maximum power to entirely stop the flow of gas. The well-publicised interruption of the flow of Russian gas towards Ukraine in 2009 generated significant maintenance costs amounting to approximately \$2 million per day.⁷³

In the aftermath of the transit crisis of 2009, Moscow sought to establish an 'early warning mechanism' comprising the provision of timely information about any planned gas shortages. The main rationale of this mechanism is to ensure that European customers have a reliable gas supply and to provide sufficient time for back-up solutions. Russia used the mechanism three months in advance before the planned gas interruption during the renewed conflict with Ukraine in 2014. This allowed the European gas industry to plan for the possibility of gas shortages.⁷⁴ This trend indicates a decreasing interest among Moscow's political establishment in using 'hard power' by cutting gas supplies on every possible occasion.

3.1.2. THE DEINSTITUTIONALISATION OF INTERNATIONAL ENERGY GOVERNANCE

The main risk related to EU-Russia energy relations consists in the weakening of institutions of governance.⁷⁵ The process of energy governance depicted in Figure 11 reveals that the legally binding mechanisms laid down in the Energy Charter Treaty (ECT) have been gradually diluted by soft-law declarations, including the International Energy Charter.⁷⁶

⁷³ The estimate remains broad and is based on expert assessments in Russia during the three-week gas supply crisis of January 2009. Only operational costs are taken into account, since long-term reputational damages cannot be assessed.

⁷⁴ Belyi, *Transnational Gas Markets*.

⁷⁵ For a detailed analysis of EU-Russia relations regarding the Energy Charter process, see Andrey Konoplyanik, "Gas Transit in Eurasia: Transit Issues between Russia and the European Union and the Role of the Energy Charter," *Journal of Energy and Natural Resource Law*, Vol 27 (3), 2009: 445-486. For an analysis of the legal dimension of the ECT regime on pipelines, see Danae Azaria, *Treaties on Transit of Energy via Pipelines and Countermeasures* (Oxford: Oxford University Press, 2015).

⁷⁶ Pami Aalto, "The new International Energy Charter: Instrumental or incremental progress in governance?," *Energy Research & Social Science*, Vol. 11 (4), 2016: 92-96.

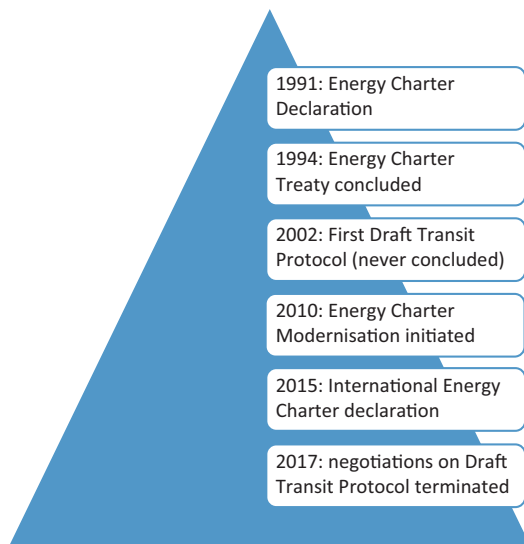


Figure 11. Energy Charter Treaty Process

In addition, the recent decision of the Energy Charter Conference to abandon the draft of a legally-binding Transit Protocol puts an end to almost two decades of efforts aimed at designing a multilateral legal regime for cross-border energy transit.⁷⁷

While Russia declared its intention not to ratify the Treaty in 2014, its official withdrawal occurred as recently as April 2018. The consequences of Russia's non-participation in the Energy Charter Treaty coupled with the new soft-law approach to energy governance may have wider implications

The consequences of Russia's non-participation in the Energy Charter Treaty coupled with the new soft-law approach to energy governance may have wider implications in terms of weakening the only existing legally binding mechanism for energy investment, trade and transit

in terms of weakening the only existing legally binding mechanism for energy investment, trade and transit. In geopolitical terms, the weakening of the Energy Charter process may have indirect implications as well. The hydrocarbon-rich states of the Caspian and Central Asian region have been the most active members

⁷⁷ International Energy Charter, "Energy Charter Conference Decisions," International Energy Charter, 2017, <https://energycharter.org/what-we-do/conference-decisions/documents/2017/> (accessed 16 April 2019).

of the multilateral energy regime and have consistently emphasised the importance of the legally binding transit provisions framed by the Energy Charter and the Draft Transit Protocol. These developments may further reduce the EU's influence in terms of attracting Caspian and Central Asian gas exports to European markets. In turn, China may become a more attractive alternative for Central Asian suppliers in the context of the 'Belt and Road Initiative'.⁷⁸ It appears that the multilateral framework is being gradually challenged by regional groupings such as the EU's internal energy market, the Eurasian gas market and China's Belt and Road Initiative, and now seems rather a 'treaty à la carte'.⁷⁹

Despite a widespread and mistaken assumption, the ECT is not based on the EU legal framework and doesn't integrate any notion of the TPA into its transit provisions (see Figure 12). Even

These developments may further reduce the EU's influence in terms of attracting Caspian and Central Asian gas exports to European markets

after the cancellations of Transit Protocol negotiations, the ECT remains relevant to dispute settlement mechanisms in relation to energy investment, which it defines in a broad manner that also covers clean energy sources and investment into energy efficiency. The ECT is the only multilateral mechanism that allows for the resolution of disputes directly between investors and a state. The ECT is even used in number of intra-EU cases, where investors challenge European states for missing protecting energy investments (including investments into clean energy). In this respect, the EU energy policy should not seem to substitute the international energy governance mechanisms.

⁷⁸ An in-depth analysis of the effects of the Belt and Road Initiative on Central Asia gas exports will be provided in a forthcoming special issue by Anatole Boute (ed.), "China's External Energy Security Energy Trade and Investment Along the Belt and Road," *Journal of World Investment and Trade*, Vol 20 (2), 2019, forthcoming.

⁷⁹ Irina Kustova, "A treaty à la carte? Some reflections on the modernization of the Energy Charter Process," *Journal of World Energy Law and Business*, Vol 9 (5), 2016: 357-369.

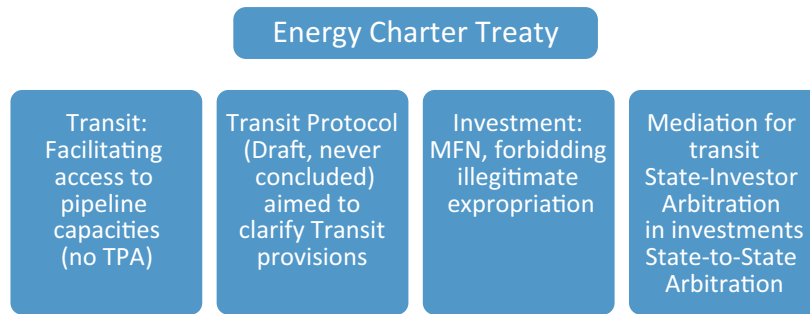


Figure 12. Energy Charter Structure

The weakening of institutions of governance caused by political tensions between Russia and the West has extended to the freezing of the EU-Russia Energy Dialogue and the EU-Russia Gas Coordination Group. Thus, bilateral contacts and coordination of policies have dwindled to nothing, thus reducing the EU’s influence on Russia to a minimum. In addition, sanctions imposed by Western countries on selected Russian energy companies may indirectly limit economic transactions in the gas sector.

EU’s Third Energy Package contradict the most favoured nation (MFN) principle laid down in the General Agreement on Tariffs and Trade (GATT). The MFN principle requires that the same treatment must be granted to any WTO member state immediately and unconditionally. Russia also argued that the EU introduced quantitative restrictions by limiting pipeline access. Furthermore, it made reference to the General Agreement on Trade in Services (GATS), which broadly covers non-storable energy supplies, including natural gas.⁸⁰ Russia regards the ownership unbundling required the Third Energy Package as a disguised restriction on foreign services and, as such, prohibited by the WTO agreements.

The weakening of institutions of governance caused by political tensions between Russia and the West has extended to the freezing of the EU-Russia Energy Dialogue and the EU-Russia Gas Coordination Group

The only major institutional mechanism is the World Trade Organization (WTO), which indeed handled one of the largest disputes related to the EU gas market liberalisation. Special attention should be paid to the case.

In the context of the deinstitutionalisation of EU-Russia energy relations and in the context of the failed negotiations on the Transit Protocol, the only remaining relevant mechanism in the energy security area is the ‘early warning mechanism’, which should still be part of the ECT modernisation process and of political communications with Russia.

Specific concerns were also expressed by Russia regarding gas sector reforms in Croatia, Hungary and Lithuania where Gazprom’s interests have declined in value following the implementation of the EU Gas Market Directive. In addition, Russia explicitly challenged Lithuania’s support mechanism for LNG purchase. It also challenged the restrictions imposed by the Commission on the usage of the OPAL pipeline and the onshore continuation of Nord Stream 1, as well as the EU infrastructure projects related to projects of common interest within the framework of Regulation No 347/2013 (the ‘TEN-E Regulation’), which aims to achieve gas market diversification.⁸¹

3.2. THE WTO CASE AND ITS IMPLICATIONS

In the aftermath of Russia’s accession to the WTO, Russia filed a claim against the EU, arguing, inter alia, that many aspects of the

⁸⁰ Danae Azaria, *Treaties on Transit of Energy via Pipelines and Countermeasures*.

⁸¹ European Union, “Regulation No 347/2013 of the European Parliament and of the Council of 17 April 2013 on guidelines for trans-European energy infrastructure,” Official Journal of the European Union, 25 April 2013, <https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:32013R0347&from=en> (accessed 16 April 2019).

3.2.1. THE WTO DECISION

The WTO Dispute Settlement Body issued a 300-page report containing details of each side's positions and arguments.⁸² The case explicitly recognises the lawfulness of the EU ownership unbundling principle by stating that 'Russia has not demonstrated that the unbundling measure in the Directive is inconsistent with Article II:1 of the GATS, or with Articles I:1 or III:4 of the GATT 1994'.⁸³ Likewise, LNG support measures are not contrary to the GATT principles. Interestingly the Dispute Settlement Body distinguishes between natural gas and LNG as different services leading to the same product. Russia has appealed this part of the decision, which makes the overall LNG support mechanism the focal point of the legal dispute.

Although the Dispute Settlement Body agreed with the EU's logic on most aspects of the case, it accepted Russia's argument to the effect that the OPAL restrictions and the objectives of the measures stemming from projects of common interest (TEN-E measure) conflicted with WTO principles.⁸⁴ Our brief (and possibly simplified) overview of the WTO case reveals that projects for infrastructural diversification cannot be designed in such a way as to counter the competitiveness of one supplier. The panel rejected the EU's argument that the TEN-E measure should be covered by Article XXj of GATT, which refers to a 'local short supply' of the product (natural gas).

The EU is now appealing the WTO conclusion that the TEN-E measure is inconsistent with the MFN principle. Although the EU has challenged the Dispute Settlement Body's decision, its challenge defends the compatibility of the TEN-E measure with WTO norms.⁸⁵ It appears that the issue of what infrastructures are

needed in relation to the 'short supply' of gas will be raised once again in respect of the case. Most probably, in the context of gas over-supply and of existence of flexible mechanisms of gas deliveries, the term 'short supply' might be hard to justify.

It seems that the Dispute Settlement Body has adopted an approach that gives some ground to each side in the dispute. Appeals made both from Brussels and Moscow to the Appellate Body will take time to be considered. Although it remains premature to discuss any final outcomes of the case, the WTO decision may soon have implications for the Baltic energy market.

3.2.2. IMPLICATIONS OF THE CASE FOR THE BALTIC GAS MARKET

As explained above, the Baltic gas market mostly depends on Russian gas. Even the Latvian UGS contains gas delivered by Gazprom. Furthermore, the LNG supply opportunity created by Klaipėda LNG terminal provides an alternative that remains more expensive than pipeline gas from Russia. The Baltic Connector between Estonia and Finland opens up an opportunity to supply either gas from the Latvian UGS or regasified gas from Klaipėda LNG terminal to Finland, which is the largest regional market. In accordance with the WTO decision, a non-discriminatory (and hence, market-based) approach will be applied and states will not be in a position to support a less competitive supplier purely for the purposes of diversification. In this case, the Baltic Connector cannot be used solely for diversification purposes against Russian gas. Hence, the connection to the Finnish market will be of most benefit in terms of achieving a more competitive supply from the Latvian UGS – or any other competitive option.

In accordance with the panel's decision, the EU is supposed to differentiate between an infrastructural base for the security of supply and an explicit policy that seeks to reduce commodity imports from one particular source (Russian gas). The WTO's approach seems to consistently favour a market-based approach over a security approach. It would be surprising if the Appellate Body diverges from this approach at a later stage in the case.

⁸² The history and background of the case is set out in World Trade Organisation, "European Union and its Member States – Certain Measures Relating to the Energy Sector," World Trade Organisation, https://www.wto.org/english/tratop_e/dispu_e/cases_e/ds476_e.htm (accessed 16 April 2019).

⁸³ World Trade Organisation, *General Agreement on Tariffs and Trade* (Geneva: World Trade Organisation, 1994), https://www.wto.org/english/docs_e/legal_e/gatt47.pdf (accessed 2 April 2019).

⁸⁴ TEN-E measure is based on the European Union, "Regulation No 347/2013." A detailed assessment is in World Trade Organisation, WTO Dispute Settlement Body, "Russia vs EU case 476. Conclusions," WTO Dispute Settlement Body, WT/DS476/R, https://www.wto.org/english/tratop_e/dispu_e/476r_conc_e.pdf (accessed 16 April 2019).

⁸⁵ This assessment has followed a communication with an anonymous lawyer at an international law firm who specialises in trade disputes.

The WTO Dispute Settlement Body's decision reflects Estonia's interest in ensuring that its infrastructure projects are in line with competition objectives. The TEN-E measure has to be in line with market interests to increase the competitiveness of the internal market. The Baltic Connector should serve the most competitive market options.

3.3. RUSSIA-US COMPETITION FOR EUROPEAN GAS MARKETS

It has become increasingly clear that Moscow and Washington have entered into competition over the European gas markets. While Russian gas is mostly supplied via pipeline networks, US firms have reinforced their grip on LNG exports as favoured by President Trump's administration. Between 2017 and 2018, US LNG exports to Europe have increased by 200% from initially negligible supply volumes and now total 7.5 bcm of gas. However, to date the share of US LNG remains a long way below Russian gas volumes (160 bcm) since pipeline gas remains more cost-effective because it does not necessitate a liquefaction process. Although Gazprom's pipeline gas remains more competitive than US deliveries, Gazprom's gas production has experienced a rise in marginal costs following the dynamics explained in Figure 8.

Poland has expanded its import terminal in Świnoujście – which is the main import terminal for US LNG in Europe – with the explicit objective of turning it into a large-scale Eastern European LNG hub and, potentially, the main LNG hub for a large part of Europe. Taking into account the entry fees charged in entry-exit zones, together

The direct use of LNG as a cryogenic fuel may create space for incremental demand for US LNG even without its being in direct competition with pipeline gas

with regasification costs, LNG delivered to Poland would not arrive on the Estonian market in regasified form via pipelines. Thus, US LNG is not in direct competition with the Russian gas pipeline in the domestic market.

The direct use of LNG as a cryogenic fuel may create space for incremental demand for US LNG even without its being in direct competition with pipeline gas. In other words, Gazprom's pipeline gas would continue to serve the traditional segments of electricity generation and heating, whereas Russia-US competition for LNG markets will mostly focus on incremental demand for LNG. As noted in section 1.4.1, the presence of Russian LNG suppliers in locations bordering on the Baltic states offers interesting options.

Hypothetically, Baltic and Finnish LNG demand can be largely absorbed by nearby Russian LNG suppliers while the US LNG may become

The price differential between Russian and US supplies has lost its significance due to the glut on the world market

a necessary back-up option distributed from Polish terminals. Nevertheless, the price differential between Russian and US supplies has lost its significance due to the glut on the world market. In other words, available cargoes can provide cheap short-term supply options related to the hub price, depending on the spot or future agreement in place.

In this context, Estonian companies may consider the supply of US LNG directly to Estonian sites and create a smaller physical hub for LNG deliveries and storage facilities serving the Gulf of Finland as well as Finland and Latvia. If the use of LNG as a cryogenic fuel increases significantly in the region, LNG can be directly delivered to Estonian ports and storage facilities – if the relevant logistical support is available (see section 1.2). There will be no need to ship large cargoes to Estonia – transshipment from large to small cargoes either in Rotterdam or Świnoujście will suffice. A TPA regime for terminals that receive LNG would ensure the best available competitive options for obtaining freely available LNG of Western origin. By contrast, long-term purchase commitments

may lead to detrimental economic effects, where buyers are forced to buy LNG that is more expensive than the options available from Russia, i.e. nearby.

Still, by opening its doors to US LNG, Estonia would also reinforce political relations with a strategic ally and ensure that there is a back-up alternative to Russian supplies. However, the diversification of supplies by origin should avoid falling into the situation represented by the Klaipėda LNG terminal, as discussed above, where the market rationale is replaced by state aid mechanisms.

It may also be argued that in the context of perfect liquid markets based on a virtual platform, physical and trade flows become detached from one another and the physical origin of the gas becomes irrelevant. In the context of a free market, trading companies will be enabled to conclude trade arrangements, for example, selling physical Russian LNG supplies under a US firm's label whenever necessary for marketing or political reasons. If the markets functioned in an ideal manner, LNG could be purchased on a virtual platform, thus creating direct competition between suppliers and choice for buyers.

Estonia should seize the opportunity to attract the interest of US LNG suppliers. This would offer Estonia an instrument to further strengthen relations with the United States. The market interest in respect of LNG-to-LNG competition should prevail in this context. Ultimately, in addition to geopolitical benefits, this approach would reinforce gas markets within the entry-exit zone as a whole.

3.4. NORD STREAM 2: INTRA-EU CONTROVERSIES

Nord Stream 2 is a continuation of the Nord Stream 1 pipeline, which is laid beneath the Baltic Sea and connects Russia with Germany. Nord Stream's initial capacity is 55 bcm, which is certainly higher than average in terms of Russia's other export projects. Nord Stream 2 will double Nord Stream's capacity and creates overcapacity in Russia's export pipelines to Europe. The capacity of the existing Ukraine-Slovakia pipeline is about 142 bcm, which is in fact sufficient to cope with almost all of the gas currently exported to Europe.

The Yamal-Europe pipeline provides another 32 bcm. With the addition of Nord Stream,

which was inaugurated in 2012, overall export capacity has reached 229 bcm per annum, while Russia's exports to Europe remain at a level of about 150-170 bcm.⁸⁶

Without entering in unnecessary rehearsal of the various policy debates, this report briefly highlights the key political and legal controversies regarding the pipeline.

3.4.1. POLITICAL CONTROVERSIES

Controversies surrounding Nord Stream 2 have been the focal point of numerous policy debates. Germany promoted the pipeline extension from Russia via the Baltic, bypassing both Poland and Ukraine. The core argument advanced by the German political class and industries concerns the need to stimulate gas flows from west to

Nord Stream 2 would increase the liquidity of the German gas trading hub

east, although most Russian gas flows in one direction, from east to west.⁸⁷ The logic of this argument is that the new pipeline would allow Russian gas to flow in various directions and stimulate gas-to-gas competition as framed by the EU's internal market rules. Nord Stream 2 would increase the liquidity of the German gas trading hub, which might even reach the same liquidity level as TTF.

Opponents of the pipeline project argued that the extension of Nord Stream does not remove Gazprom's monopoly over exports and further reinforces the latter's grip on the European markets.⁸⁸ Furthermore, one should not forget that the objectives of the EU Energy Union principle of solidarity between Member

⁸⁶ Further details on Nord Stream 2 are available from "Nord Stream 2," Nord Stream 2 AG, <https://www.nord-stream2.com/> (accessed 12 April 2019).

⁸⁷ One of the reports in favour of the Nord Stream 2 pipeline seems to reflect a number of arguments advanced by German industrial groups about Nord Stream 2. See Andreas Goldthau, *Assessing Nord Stream 2: Regulation, geopolitics & energy security in the EU, Central Eastern Europe & the UK*, Strategy Paper 10 (London: King's College London, 2016), <https://www.kcl.ac.uk/sspp/departments/warstudies/research/groups/eucers/pubs/strategy-paper-10.pdf> (accessed 16 April 2016).

⁸⁸ A range of critical points regarding Nord Stream 2 are advanced in Alan Riley, "Nordstream 2: Too Many Obstacles, Legal, Economic, and Political to be Delivered?," Atlantic Council, Issue Brief, November 2015, https://www.atlanticcouncil.org/images/publications/Nordstream_2_web_1125.pdf (accessed 12 April 2019).

States. Among other objections, Warsaw has expressed concern over losing gas volumes shipped via the Yamal-Europe pipeline that connects Russia to Germany via Belarus and Poland itself. Allegedly, Russia would be able to reduce the volumes transported via Poland without violating its supply obligations towards European consumers in the west.

Furthermore, Nord Stream 2 aims to bypass Ukraine, the major gas transit state regarded in vulnerable position because of Russia's export pipeline overcapacity. Ukraine is a member of the Energy Community Treaty and therefore solidarity principle may need to apply.⁸⁹

In terms of background motivation, it appears that Germany and Poland are in competition in terms of the establishment of gas import hubs in the larger area of the Baltic basin.

It appears that Germany and Poland are in competition in terms of the establishment of gas import hubs in the larger area of the Baltic basin

3.4.2. LEGAL CONTROVERSIES

Legal controversies surrounding the pipeline have accelerated since the EU adopted an amendment to the Gas Market Directive allowing for extension of the application of EU competition law to external offshore pipelines. The amendment, which was passed in 2019, allows EU Member States to extend EU competition rules to any import pipeline even if it crosses areas governed by the international law of the sea. The Gas Market Directive requires EU Member States (Germany in this case) to ensure the TPA for a pipeline that crosses national territorial waters. In this way, the Directive indirectly requires the introduction of a TPA regime also in the non-EU part of the pipeline (Russian territory in this case). The overall

⁸⁹ Confusion between the Energy Charter Treaty and the Energy Community Treaty should be avoided. The Energy Charter Treaty is a multilateral framework of governance in trade, transit and investment, whereas the Energy Community Treaty seeks to export the EU's energy acquis to signatory countries. See Energy Community, "Energy Community Homepage," <https://www.energy-community.org/>.

objective of the amendment to the EU Directive is to apply general EU regulations and principles to the controversial EU-Russia pipeline.⁹⁰

In accordance with the Directive, Nord Stream 2 can offer TPA in both Russian and German pipeline sections at 10% of pipeline capacity both for short and mid-term supply. The natural gas trading hub in Saint Petersburg can be a place where companies can book capacity for short and mid-term supplies.⁹¹ Interestingly, German companies can also become players in the Saint Petersburg gas hub and trade gas together with Gazprom directly from the Russian border. This may lead to an unprecedented regime for gas supplies, where a European company obtains Russian gas directly from Russian territory and ships it to the market.

Furthermore, Nord Stream 2 can increase competition between Gazprom and independent gas producers, including the Russian national oil company Rosneft. The latter has expressed interest in securing access to the Nord Stream 2 pipeline capacity and has more or less demanded a TPA regime for Russian gas exports. Even though Rosneft has not obtained any stake in the pipeline export so far, we may observe that Gazprom's gas export monopoly is challenged by European rules and even domestic competitors. In particular, Rosneft's rhetoric reveals Gazprom's shaky position in maintaining its dominant position in relation to Russian exports.

The controversy over the TPA exemption (or application for one) for Nord Stream 2 reflects a latent power struggle between German and Russian industry players where what is at stake is long-term influence on gas regulatory developments

⁹⁰ Kim Talus, "EU Gas Market Amendment – despite of compromise problems remain," Oil, Gas, Energy Law Intelligence, 6 March 2019, <http://fsr.eui.eu/eu-common-rules-for-gas-import-pipelines-the-amendment-to-the-gas-directive/> (accessed 16 April 2019).

⁹¹ Katya Yafimava, "Gas Directive amendment: Implications for Nord Stream 2," Working Paper, Oxford for Institute of Energy Studies, February 2019, <https://www.oxfordenergy.org/wpcms/wp-content/uploads/2019/03/Gas-Directive-Amendment-Insight-49.pdf> (accessed 2 April 2019).

Gazprom appears to be resisting these challenges and is considering applying for a TPA exemption in respect of the Nord Stream 2 pipeline. An exemption is already in place for Nord Stream 1. Gazprom's officers have repeatedly claimed that there is a need to maintain the export monopoly.

In practice, the controversy over the TPA exemption (or application for one) for Nord Stream 2 reflects a latent power struggle between German and Russian industry players where what is at stake is long-term influence on gas regulatory developments. If the exemption is granted, Gazprom certainly gains the upper hand. In contrast, German industry players and, more implicitly, Russian independent suppliers, may favour the application of TPA.

3.4.3. IMPLICATIONS FOR THE BALTIC REGION

Ceteris paribus, neither completion nor cancellation of the project will affect the Baltic regional market. The risk of Nord Stream 2 being used leverage by Gazprom remains low for the Baltic states because – unlike Poland or Ukraine – Baltic pipelines are not used to transport Russian gas to the western parts of Europe.

However, the Nord Stream 2 pipeline does threaten to weaken intra-EU solidarity principles

The Nord Stream 2 pipeline does threaten to weaken intra-EU solidarity principles at a political level

at a political level. Tension between Germany and Poland as well as intra-EU legal controversies tend to weaken the EU's integrated market approach. Likewise, distance from the Energy Community principles may engender longer-term damage to the reputation of the Energy Community Treaty and thus to the external dimensions of EU energy policy.

Nord Stream 2 should not be considered as an issue in terms of energy security for Estonia. Furthermore, Nord Stream 2 would increase the liquidity of Gaspool, in Germany, which is used as a gas marker in the Baltic states. However, the scope of the Energy Community Treaty solidarity principle should not be underestimated and Ukraine's interests should not be harmed by the project.

CONCLUSIONS AND RECOMMENDATIONS

This study takes the view that the energy security is best ensured by competitive markets, where commercial considerations prevail over political ones, and where international norms are followed in ensuring integrity of markets. In this context, no overinvestment in infrastructure would occur. Likewise, markets ensure the gas-driven energy transition which is deemed to be the most competitive solution to achieve a carbon-free economy.

In this ideal market scenario, political disputes are resolved by international institutions. Partly in line with market-oriented legal principles, the two cases discussed above (the EU Commission's binding decision imposed on Gazprom and the WTO case), reject the two extremes of the gas market. One of these extremes is represented by the situation in which an individual company creates conditions for market partitioning. The other arises when states (or a union of states) utilise infrastructural development to hinder the competitiveness of one supplier. In particular, the WTO Dispute Settlement Body decision seems to favour the market approach, which indeed secures energy supplies.

The situation in the Baltic region rather reflects an imperfect market. This has been caused by a low and declining gas demand, market partitioning by Gazprom and inverse vertical integration with few national companies involved in gas imports

However, the situation in the Baltic region rather reflects an imperfect market. This has been caused by a low and declining gas demand, market partitioning by Gazprom and inverse vertical integration with few national companies involved in gas imports. Overinvestment in gas diversification has also taken place in the case of Klaipėda LNG terminal. This project has not stimulated regional cooperation, and has in fact even contributed to frictions in the cooperation between the Baltic states.

In the imperfect market scenario, the best and most competitive solutions are often overlooked, the state ignores market trends and therefore overinvestment in unnecessary capital-intensive infrastructure often occurs. This leads to structural economic inefficiency and an increase in the social costs of energy security.

The most significant difference between the ideal market and the imperfect market lies in the role played in the economy by the state. The ideal market presupposes a strong independent regulatory authority focusing solely on the energy markets, together with the political will to preserve the functioning of this market in international and domestic arenas as projected by an energy minister and/or energy ministry. In this scenario, participation in the market by state-owned companies and incumbents would have to gradually decrease. By contrast, an imperfect market implies the opposite: the regulatory authority remains silent about ongoing vertical integration, the political will to maintain the integrity of the market and advance free market competition principles is largely absent, and state-owned companies consolidate their positions in the market.

The weaponisation of energy relations could be a further step towards worsening markets.

This occurs when interdependencies become subject to political pressures that are dictated by geopolitical considerations. Aspects of such weaponisation can be seen in the gradual deinstitutionalisation of international energy governance, as shown in the gas transit crises affecting Russia-Ukraine relations and political controversies surrounding the Nord Stream 2 pipeline project. This scenario is largely a function of the broader geopolitical confrontation between Russia and the West that shows no signs of abating.

It can be hypothesised that the current situation can evolve in either direction. Figure 13 summarises the consequences of an ideal market, an imperfect market and the geopolitical weaponisation of energy supplies as dominant conditions.

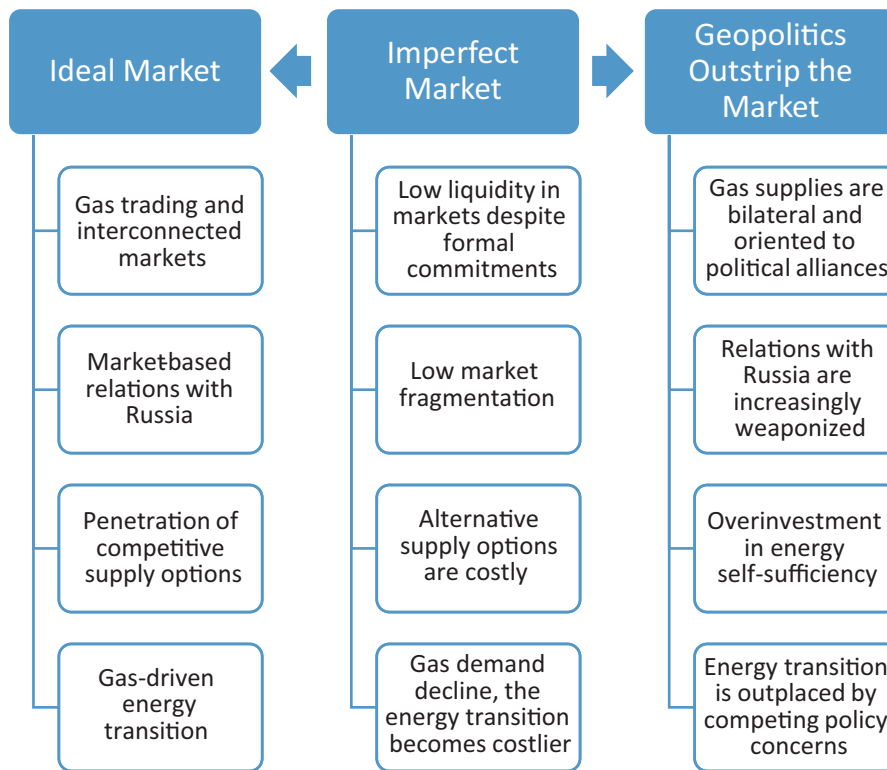


Figure 13. Market Scenarios

The illustration of different scenarios for gas markets reveals a need for a more proactive approach both nationally and internationally. Likewise, Estonia may need to be ready for the weaponisation scenario as well, regardless the

In the absence of a functioning market, risks to security of supply increase, whereas low demand volumes reduce the ability to maintain diversified and competitive supply options

level of probability of this worst-case scenario. In the absence of a functioning market, risks to security of supply increase, whereas low demand volumes reduce the ability to maintain diversified and competitive supply options. In turn, the absence of a functioning gas market may lead to an economically expensive energy transition instead of a focus on a more competitive natural gas-driven transition.

In order to ensure a transition from an imperfect market situation to an ideal market situation, the following policy considerations for Estonia's energy policy should be taken into account:

- **Energy security is best ensured by a fully integrated regional gas market** organised in accordance with the Gas Target Model. The entry-exit zone between Estonia, Finland and Latvia is the first important step in that direction. The entry-exit zone would be enriched by additional entries from LNG terminals with the TPA principle applicable to each entry. It may also be necessary to develop a physical LNG hub for more flexible maritime and onshore deliveries of LNG for the direct use of cryogenic fuel and onsite regasification. LNG terminal in Paldiski can then play an important role in this direction.
- **A common balancing platform between Estonia, Finland and Latvia** should lead to a common virtual platform, possibly beyond the current structure of the Get Baltic platform in order to ensure frictionless cooperation between the participants in the entry-exit zone and the virtual platform. The integration of Lithuania into the entry-exit zone and related gas hub should be made conditional on the phasing out of the state aid measures applied in respect of Klaipėda LNG terminal.

- **Greater efforts are required to reverse vertical integration and to ensure competition at entry points**, including the application of the TPA principle at the LNG terminals. Gazprom's activities no longer pose a risk of market partitioning, but this risk is presented by the activities of domestic players and by the increasing role played by the state. Gas market diversification principally involves higher market liquidity as opposed to expensive additional infrastructures. A state-driven energy economy represents risks for the market approach.
- **Estonia needs to enhance the political profile of, and strengthen policymaking capacity in, the energy sector** by establishing the position of energy minister in the government and perhaps even creating a separate energy ministry. This would give the National Energy Policy Plan greater political significance, consolidate policy expertise in the sector and help direct Estonia's EU-level efforts to build intra-EU alliances with a view to taking a market approach in the gas and overall energy sector. The existing regulatory authority should also reinforce its focus on energy markets and strengthen its expertise in the sector or – as the optimal solution – create a dedicated independent regulatory authority for energy markets.
- Although the National Energy and Climate Plan declares a need to increase expenditure on research, it should also **focus on expert capacity-building via specialised programmes on energy markets, law and policies and via executive training** on the areas covered by the Energy Union.
- **Gas-driven energy transition should be prioritised over imports of electricity and balance the ambition of electrification of national road transport.** The economic and environmental costs of rapid electrification have not yet been assessed and therefore any steps towards an electricity-driven energy transition needs to be evaluated prior to setting ambitious and unrealistic policy targets.
- Estonia needs to take **a more proactive approach at international level by supporting the EU's pro-market vision inside**

the EU. A process of de-institutionalisation of international energy governance should be avoided, whereas contacts with Russia should also cover elaboration of the early warning mechanism that applies in relation to any form of disruption, including technical disruptions.

- **A liquid LNG market with competing supply choices on the virtual platform remains the best-case scenario for Estonia.** In the event of the weaponisation scenario coming to pass, Estonia will need to reinforce its relations with its key strategic ally, the US, and create a framework that allows it to draw on the US LNG supply, although such reliance should still be based on flexible infrastructure. Long-term contractual arrangements should be avoided.

LIST OF REFERENCES

- Aalto, Pami. "The new International Energy Charter: Instrumental or incremental progress in governance?" *Energy Research & Social Science*, Vol. 11 (4), 2016: 92-96.
- Agency for the Cooperation of Energy Regulators (ACER). *European Gas Target Model: Review and Update*. Ljubljana: ACER, January 2015. <https://www.acer.europa.eu/Events/Presentation-of-ACER-Gas-Target-Model-/Documents/European%20Gas%20Target%20Model%20Review%20and%20Update.pdf>. Accessed 16 April 2019.
- . "ACER's vision of the European gas market." ACER, 2015. <https://acer.europa.eu/Media/Citizens%20summaries/ACER-CS-01-15.pdf>. Accessed 16 April 2019.
- . *Framework Guidelines on Gas Balancing in Transmission Systems (Update)*. Ljubljana: ACER, 12 April 2011. http://www.acer.europa.eu/Official_documents/Public_consultations/Closed%20public%20consultations/PC-04_FG_Gas_Balancing_in_Transmission_Systems/Document%20Library/1/DFGC_2011G002%20FG%20Gas%20Balancing.pdf. Accessed 16 April 2019.
- AmberGrid. *Natural Gas Transmission System Operator's Ten-Year Network Development Plan 2018–2027*. Vilnius: AB AmberGrid, 2018. https://www.ambergrid.lt/uploads/structure/docs/220_28c0f30a8f3970420eeda91b06cf3212.pdf. Accessed 19 April 2019.
- Azaria, Danae. *Treaties on Transit of Energy via Pipelines and Countermeasures*. Oxford: Oxford University Press, 2015.
- Bates, Judith. *Biomethane for Transport from Landfill and Anaerobic Digestion: Report for the UK Department of Transport*. Harwell, Didcot: Ricardo-AEA Ltd, 2015. https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/416002/biomethane-for-transport.pdf. Accessed on 23 September 2018.
- Belyi, Andrei. "Transformation of the LNG market: The shift from large-scale to fragmented solutions." Global LNG Hub, 2016. <https://globallnghub.com/articles/transformation-of-the-lng-market-the-shift-from-large-scale-to-fragmented-solutions>. Accessed 16 April 2019.
- . *Transnational Gas Markets and Euro-Russian Energy Relations*. London: Palgrave Macmillan, 2015.
- Belyi, Andrei, and Andreas Goldthau. "Between a rock and a hard place: International market dynamics, domestic politics and Gazprom's strategy." EUI Working Papers, RSCAS 2015/22, April 2015. http://cadmus.eui.eu/bitstream/handle/1814/35398/RSCAS_2015_22.pdf. Accessed 19 April 2019.
- Boute, Anatole, ed. "China's External Energy Security Energy Trade and Investment Along the Belt and Road." *Journal of World Investment and Trade*, Vol 20 (2), 2019, forthcoming.
- Bryza, Matthew J., and Emmet Tuohy. *Connecting the Baltic States to Europe's Gas Market*. Tallinn: International Centre for Defence Studies, 2013. <https://icds.ee/connecting-the-baltic-states-to-europes-gas-market-3/>. Accessed 2 April 2019.
- Cluzel, Celine, and Sophie Lyons. *Independent Assessment of the Benefits of Supplying Gas for Road Transport from the Local Transmission System: Technical Summary Report*. Element Energy Ltd, July 2017. <https://cadentgas.com/getattachment/About-us/Innovation/Projects/Revolutionising-Transport/Promo-Full-report/Element-Energy-Monitoring-of-Leyland-station-final-summary.pdf>. Accessed 16 April 2019.
- Dannreuther, Roland. *Energy Security*. Cambridge: Polity Press, 2017.
- DNV KEMA. *Study on Entry-Exit Regimes in Gas*. Groningen: KEMA Nederland B.V., 2013. <https://ec.europa.eu/energy/sites/ener/files/documents/201307-entry-exit-regimes-in-gas-parta.pdf>. Accessed 19 April 2019.
- International Energy Charter. "Energy Charter Conference Decisions." International Energy Charter, 2017. <https://energycharter.org/what-we-do/conference-decisions/documents/2017/>. Accessed 16 April 2019.
- Elering. *Estonian Gas Transmission Network Development Plan 2018 – 2027*. Tallinn: Elering AS, 2018. https://elering.ee/sites/default/files/attachments/Estonian_gas_transmission_network_development_plan_2018_2027.pdf. Accessed 19 April 2019.
- Energy Charter Secretariat. *Putting a Price on Energy: New Report on International Oil and Gas Pricing Mechanisms*. Brussels: Energy Charter Secretariat, 2007. https://energycharter.org/fileadmin/DocumentsMedia/Thematic/Oil_and_Gas_Pricing_2007_en.pdf. Accessed 2 April 2019.
- Energy Community. "Energy Community Homepage." <https://www.energy-community.org/>.
- Energy Transitions Commission. *Mission Possible: Reaching Net-Zero Carbon Emissions From Harder-To-Abate Sectors by Mid-Century*. London: Energy Transitions Commission, 2018. http://www.energy-transitions.org/sites/default/files/ETC_MissionPossible_FullReport.pdf. Accessed 19 April 2019.
- European Network of Transmission System Operators for Gas (ENTSOG). *Baltic Energy Market Interconnection Plan*. Brussels: ENTSOG, 2017. https://www.entsog.eu/sites/default/files/files-old-website/publications/GRIPs/2017/entsog_BEMIP_GRIP_2017_Main_web_s.pdf. Accessed 19 April 2019.
- . *BEMIP Gas Regional Investment Plan 2012 – 2021*. Brussels: ENTSOG, 2012. https://www.entsog.eu/sites/default/files/entsog-migration/publications/GRIPs/2012/GRIP_BEMIP_MAIN.pdf. Accessed 19 April 2019.

- . *Ten-Year Network Development Plan: Infrastructure Report 2018*. Brussels: ENTSO, 2018. https://www.entsog.eu/sites/default/files/2018-12/ENTSO TYNDP 2018 Infrastructure%20Report_web.pdf. Accessed 19 April 2019.
- European Union. European Commission. “Building the energy union.” Energy Strategy and Energy Union. <https://ec.europa.eu/energy/topics/energy-strategy-and-energy-union/building-energy-union>. Accessed 16 April 2019.
- . “Decision relating to a proceeding under Article 102 of the Treaty on the Functioning of the European Union (TFEU) and Article 54 of the EEA Agreement.” European Commission. Anti-Trust and Cartel Cases. Case AT.39816 – Upstream Gas Supplies in Central and Eastern Europe. http://ec.europa.eu/competition/antitrust/cases/docs/39816/39816_10148_3.pdf. Accessed 19 April 2019.
- . *Report 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. Fourth Report on the State of the Energy Union*. COM(2019) 175 final, 9 April 2019. https://ec.europa.eu/commission/sites/beta-political/files/fourth-report-state-of-energy-union-april2019_en_0.pdf. Accessed 16 April 2019.
- . “State Aid SA.44678 (2018/N) – Lithuania - Modification of aid for LNG Terminal in Lithuania.” C(2018) 7141 final, 31 October 2018. http://ec.europa.eu/competition/state_aid/cases/275450/275450_2035277_133_2.pdf. Accessed 16 April 2019.
- . “Entry-Exit Regimes in Gas.” European Commission, 2018. <https://ec.europa.eu/energy/en/studies/entry-exit-regimes-gas>. Accessed 16 April 2019.
- . “Upstream gas supplies in Central and Eastern Europe.” European Commission. Anti-Trust and Cartel Cases. Case AT.39816 – Upstream Gas Supplies in Central and Eastern Europe. http://ec.europa.eu/competition/elojade/isef/case_details.cfm?proc_code=1_39816. Accessed 19 April 2019.
- European Union. “Directive 2009/73/EC of the European Parliament and of the Council concerning common rules for the internal market in natural gas and repealing Directive 2003/55/EC.” *Official Journal of the European Union*, 14 August 2008. <https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:32009L0073&from=EN>. Accessed 16 April 2019.
- . “Regulation No 347/2013 of the European Parliament and of the Council of 17 April 2013 on guidelines for trans-European energy infrastructure.” *Official Journal of the European Union*, 25 April 2013. <https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:32013R0347&from=en>. Accessed 16 April 2019.
- Gas Infrastructure Europe (GIE). “LNG Map 2018: Existing and Planned Infrastructure.” Gas Infrastructure Europe (GIE), Brussels, 2018. https://www.gie.eu/download/maps/2017/GIE_LNG_2018_A0_1189x841_FULL.pdf. Accessed 22 April 2019.
- GasTerra. “What is liquidity and how do you measure that?” 30 January 2015. <https://www.gasterra.nl/en/news/what-is-liquidity-and-how-do-you-measure-that>. Accessed 2 April 2019.
- “Gazprom holds 54% Lithuania’s gas market in 2017.” *The Baltic Course*, 24 January 2018. <http://www.baltic-course.com/eng/energy/?doc=137070>. Accessed 16 April 2019.
- Goldthau, Andreas. *Assessing Nord Stream 2: Regulation, geopolitics & energy security in the EU, Central Eastern Europe & the UK*. Strategy Paper 10. London: King’s College London, 2016. <https://www.kcl.ac.uk/sspp/departments/warstudies/research/groups/eucers/pubs/strategy-paper-10.pdf>. Accessed 16 April 2016.
- Hamina LNG Oy. “About Hamina LNG.” <https://haminalng.fi/home/>. Accessed on 19 April 2019.
- Heather, Patrick. “European traded gas hubs: An updated analysis on liquidity, maturity and barriers to market integration.” Working Paper. Oxford Institute for Energy Studies, May 2017. <https://www.oxfordenergy.org/wpcms/wp-content/uploads/2017/05/European-traded-gas-hubs-an-updated-analysis-on-liquidity-maturity-and-barriers-to-market-integration-OIES-Energy-Insight.pdf>. Accessed 16 April 2019.
- Henderson, James, and Arild Moe. “Russia’s gas ‘Triopoly’: Implications of a changing gas sector structure.” *Eurasian Geography and Economics*, Vol 58 (4), 2017: 442-468.
- ICIS. “The 11th European Gas Conference and LNG Forum.” ICIS. Amsterdam, 20-21 September 2017.
- International Gas Union. *World LNG Report: 2015 Edition*. Fornebu: International Gas Union, 2015. https://www.igu.org/sites/default/files/node-page-field_file/IGU-World%20LNG%20Report-2015%20Edition.pdf. Accessed 22 April 2019.
- Konoplyanik, Andrey. “Gas Transit in Eurasia: Transit Issues between Russia and the European Union and the Role of the Energy Charter.” *Journal of Energy and Natural Resource Law*, Vol 27 (3), 2009: 445-486.
- Kotane, Zane. “Vienotais Dabagāzes Tirgus 2020” (Single Natural Gas Market 2020). Connexus Baltic Grid. Riga Energy Forum, Riga, 7 March 2019.
- Kustova, Irina. “A treaty à la carte? Some reflections on the modernization of the Energy Charter Process.” *Journal of World Energy Law and Business*, Vol 9 (5), 2016: 357-369.
- Kustova, Irina. “EU–Russia Energy Relations, EU Energy Integration, and Energy Security: the State of the Art and a Roadmap for Future Research.” *Journal of Contemporary European Research*, Vol 11 (3), 2015: 288-295.

- Le Fevre, Christopher, Mike Madden and Nick White. *LNG in Transportation*. Rueil Malmaison: CEDIGAZ, 2014.
- Lindroos, Tomi J., Antti Lehtilä, Tiina Koljonen, Anders Kofoed-Wiuff, János Hethey, Nina Dupont, and Aisma Vitiņa. *Baltic Energy Technology Scenarios 2018*. Copenhagen: Nordic Council of Ministers, 2018. <http://norden.diva-portal.org/smash/get/diva2:1195548/FULLTEXT01.pdf>. Accessed 16 April 2019.
- “Lithuania’s Achema, LET buy LNG from Russia’s Novatek.” *The Baltic Course*, 18 April 2019. <http://www.baltic-course.com/eng/energy/?doc=148693>. Accessed 19 April 2019.
- “Lithuania to purchase LNG terminal’s vessel amid cost cutting efforts.” *Xinhua / Delfi.lt*, 22 November 2018. <https://en.delfi.lt/business/lithuania-to-purchase-lng-terminals-vessel-amid-cost-cutting-efforts.d?id=79654421>. Accessed 16 April 2019.
- Liuhto, Kari. “Liquefied Natural Gas in the Baltic Sea Region.” *Journal of East-West Business*, Vol. 19 (1-2), 2013: 33-46.
- “LNG bunker vessel Kairos docks in Klaipeda.” *The Baltic Course*, 2 January 2019. <http://www.baltic-course.com/eng/transport/?doc=146220>. Accessed 2 April 2019.
- Martinez, Miguel, Martin Paletar, and Harald Hecking. *The 2014 Ukrainian Crisis: Europe’s increased security position*. Cologne: Institute of Energy Economics (EWI), 2015.
- McKinsey and Company. *Energy Insights: Global Gas Outlook to 2035*. McKinsey & Company, 2019. <https://www.mckinsey.com/solutions/energy-insights/global-gas-lng-outlook-to-2035>. Accessed 22 April 2019.
- Molis, Arūnas. “Towards a Regional Gas Market in the Baltic States: Political, Economic and Legal Aspects.” *Humanities and Social Sciences*, Volume 24 (1), 2016: 91-126.
- Nord Stream 2 AG, “Nord Stream 2,” <https://www.nord-stream2.com/>. Accessed 12 April 2019.
- Pakalkaitė, Vija, and Joshua Posaner. “The Baltics: Between Competition and Cooperation.” In *New Political Economy of Energy in Europe*, edited by Jacob Godzimirski. London: Palgrave Macmillan, 2019.
- Pelkmans, Luc and Liisa Ruuder. *IEA Bioenergy Country Reports: Estonia – 2018. Bioenergy policies and status of implementation*. Paris: International Energy Agency, 2018. https://www.ieabioenergy.com/wp-content/uploads/2018/10/CountryReport2018_Estonia_final.pdf. Accessed 22 April 2019.
- Pfoser, Sarah, Oliver Schauer, and Yasel Costa. “Acceptance of LNG as an alternative fuel: Determinants and policy implications.” *Energy Policy*, Vol. 120 (4), 2018: 259-267.
- Piirimäe, Kristjan, Viktoria Blonskaja, and Enn Loigu. “Spatial Planning of Biogas Stations in Estonia.” 9th International Conference Environmental Engineering. Vilnius, Lithuania, 22-23 May 2014: 1–6.
- Pöyry Management Consulting (UK) Ltd. *Independent Economic Analysis of The Long -Term Liquefied Natural Gas Import Solution to the Republic of Lithuania: Report for Klaipeda Nafta*. Oxford: Pöyry Management Consulting (UK) Ltd, 2018. https://www.kn.lt/uploads/files/dir49/dir2/9_0.php?fbclid=IwAR3mgejXwWzDqPRFnjMkjsvXqeLtRseeLkzG6LgMOwQb6XgRW58G63ywjg. Accessed 16 April 2019.
- Russian Federation. President. “Ukaz Prezidenta Rossiyskoy Federatsii ot 11.09.2012 g. N 1285 o merah po zashchite interesov Rossiyskoy Federatsii pri osushchestvlenii rossiyskimi yuridicheskimi litsami vneshneekonomicheskoy deyatel’nosti” (Executive Order of the President of the Russian Federation No 1285 on 11 September 2012 regarding the measures protecting the interests of the Russian Federation in conducting the external economic activity by Russia’s legal entities). President of the Russian Federation, 12 September 2012. <http://kremlin.ru/acts/bank/36031>. Accessed 21 April 2019.
- Republic of Estonia. *National Energy and Climate Plan (NECP 2030): Estonia’s Communication to the European Commission under Article 9(1) of Regulation (EU) 2018/1999*. Tallinn, December 2018. https://ec.europa.eu/energy/sites/ener/files/documents/ec_courtesy_translation_ee_necp.pdf. Accessed 22 April 2019.
- . Ministry of Economic Affairs and Communication. *Energiamajanduse arengukava aastani 2030* (Energy development plan until 2030). Ministry of Economic Affairs and Communication, Order 285, 20 October 2017. https://www.mkm.ee/sites/default/files/enmak_2030.pdf. Accessed 16 April 2019.
- . Competition Authority. “Gas Markets Review.” Competition Authority, 2015, 2016, 2017. <https://www.konkurentsiamet.ee/?id=14463>. Accessed 2 April 2019.
- Republic of Finland. Eduskunta. “Hallituksen esitys eduskunnalle laeiksi maakaasumarkkinain, sähkö- ja maakaasumarkkinoiden valvonnasta annetun lain 10 §:n sekä sähkömarkkinain 56 §:n muuttamisesta” (Proposal by the Government to the Parliament to amend Article 10 of the Natural Gas Market Act, the Act on the Supervision of the Electricity and Natural Gas Market and Section 56 of the Electricity Market Act). Eduskunta, HE 290/2018 vp. https://www.eduskunta.fi/FI/vaski/HallituksenEsitys/Documents/HE_290+2018.pdf. Accessed 16 April 2019.
- Republic of Lithuania. National Commission for Energy Control and Prices. “Energy Regulators of the Baltic States and Finland Agree on the Pricing of Services of Natural Gas Transmission in the Region.” National Commission for Energy Control and Prices, 9 November 2017. <https://www.vkekk.lt/en/Pages/Updates/Energy-Regulators-of-the-Baltic-States-and-Finland-Agree-on-the-Pricing-of-Services-of-Natural-Gas-Transmission-in-the-Regi.aspx>. Accessed 16 April 2019.

- . “Komisija pakoregavo 2019 metams nustatytą SGD terminalo saugumo dedamąją” (The Commission adjusted the LNG terminal’s security mark-up for 2019). National Commission for Energy Control and Prices, 31 December 2018. <https://www.regula.lt/Puslapiai/naujienos/2018-metai/2018-gruodis/2018-12-31/komisija-pakoregavo-2019-metams-nustatyta-sgdt-saugumo-dedamaja.aspx>. Accessed 2 April 2019.
- Republic of Lithuania. Ministry of Energy. “Agreement signed on a feasibility study for the electricity generation project.” Ministry of Energy, 15 March 2019. <http://enmin.lrv.lt/en/news/agreement-signed-on-a-feasibility-study-for-the-electricity-generation-project>. Accessed 16 April 2019.
- Riley, Alan. “Nordstream 2: Too Many Obstacles, Legal, Economic, and Political to be Delivered?” Atlantic Council. Issue Brief, November 2015. https://www.atlanticcouncil.org/images/publications/Nordstream_2_web_1125.pdf. Accessed 12 April 2019.
- Ruby, Kristian. “Decarbonization pathways in European Power Sector & Economy.” Presentation. Riga Energy Forum. Riga, Latvia, 7 March 2019.
- Siddi, Marco. *Russia’s Evolving Gas Relationship with the European Union: Trade surges despite political crises*. Briefing Paper 246. Helsinki: Finnish Institute of International Affairs, 2018. https://www.fia.fi/wp-content/uploads/2018/09/bp246_eu_russia_gas_relations2.pdf. Accessed 16 April 2019.
- Stern, Jonathan, and Katya Yafimava. “The EU Competition investigation of Gazprom’s sales in Central and Eastern Europe.” Working Paper. Oxford Institute for Energy Studies, July 2017. <https://www.oxfordenergy.org/wpcms/wp-content/uploads/2017/07/The-EU-Competition-investigation-of-Gazproms-sales-in-central-and-eastern-Europe-a-detailed-analysis-of-the-commitments-and-the-way-forward-NG-121.pdf>. Accessed 2 April 2019.
- Talus, Kim. “EU Gas Market Amendment – despite of compromise problems remain.” *Oil, Gas, Energy Law Intelligence*, 6 March 2019. <http://fsr.eui.eu/eu-common-rules-for-gas-import-pipelines-the-amendment-to-the-gas-directive/>. Accessed 16 April 2019.
- Talus, Kim. *Introduction to EU Energy Law*. Oxford: Oxford University Press, 2016.
- Talus, Kim. “European Union Energy: New Role for States and Markets.” In *States and Markets in Hydrocarbon Sectors*, edited by Andrei Belyi and Kim Talus. London: Palgrave Macmillan, 2015: 198-213.
- World Trade Organisation. WTO Dispute Settlement Body. “Russia vs EU case 476. Conclusions.” WTO Dispute Settlement Body, WT/DS476/R. https://www.wto.org/english/tratop_e/dispu_e/476r_conc_e.pdf. Accessed 16 April 2019.
- . *General Agreement on Tariffs and Trade*. Geneva: World Trade Organisation, 1994. https://www.wto.org/english/docs_e/legal_e/gatt47.pdf. Accessed 2 April 2019.
- . “European Union and its Member States – Certain Measures Relating to the Energy Sector.” World Trade Organisation. https://www.wto.org/english/tratop_e/dispu_e/cases_e/ds476_e.htm. Accessed 16 April 2019.
- Yafimava, Katya. “Gas Directive amendment: Implications for Nord Stream 2.” Working Paper. Oxford for Institute of Energy Studies, February 2019. <https://www.oxfordenergy.org/wpcms/wp-content/uploads/2019/03/Gas-Directive-Amendment-Insight-49.pdf>. Accessed 2 April 2019.
- Yafimava, Katya. *The Transit Dimension of EU Energy Security: Russian Gas Transit Across Ukraine, Belarus, and Moldova*. Oxford: Oxford University Press, 2012.

FOLLOW US ON:

 [FACEBOOK.COM/ICDS.TALLINN](https://www.facebook.com/ICDS.TALLINN)

 [TWITTER: @ICDS_TALLINN](https://twitter.com/ICDS_TALLINN)

 [LINKEDIN.COM/COMPANY/3257237](https://www.linkedin.com/company/3257237)

INTERNATIONAL CENTRE FOR DEFENCE AND SECURITY
63/4 NARVA RD., 10152 TALLINN, ESTONIA
INFO@ICDS.EE, WWW.ICDS.EE



ISSN 2228-0529

ISBN 978-9949-7331-7-0 (PRINT)

ISBN 978-9949-7331-8-7 (PDF)