International Journal of Energy Economics and Policy

ISSN: 2146-4553

available at http: www.econjournals.com

International Journal of Energy Economics and Policy, 2016, 6(4), 789-800.

Energy Imports, Geoeconomics, and Regional Coordination: The Case of Germany and Poland in the Baltic Energy System - Close Neighbours, Close(r) Cooperation?

Thomas Sattich*

Research Centre for East European Studies at the University of Bremen, Klagenfurter Straße 3, D-28359 Bremen, Germany.
*Email: thomas.sattich@gmx.net

ABSTRACT

When the Baltic Sea region is included in debates concerning European energy policy, the focus often lies on the transit of natural gas. However, this focus on gas transit is too narrow to fully grasp the region as a wider element within the complex fabric of the European energy system. This article therefore approaches the energy system of the Baltic Sea region in a holistic manner and discusses flows of natural gas, oil, coal, and electricity. Against this backdrop, the article presents and discusses the energy supply and demand situation of the Baltic Sea littoral states. Focussing strictly on the Baltic Sea region in a narrow geographical sense allows a detailed visualisation of energy flows between individual countries. From a geoeconomic perspective, the article then analyses and compares the positions of Germany and Poland in the regional energy system; furthermore, scenarios concerning the effect of Polish and German national energy policies on regional energy flows are presented and discussed. As most European countries are energy importers, this discussion focuses on the effect of national policies on energy imports and their impact on the regional energy system. Based on this discussion, the article evaluates the geoeconomic implications of these scenarios for Poland and Germany and the prospects for better aligning the two countries' national energy policies.

Keywords: Baltic Sea Region, Energy Flows, Geoeconomics
JEL Classification: F500, L710, L950, L940, R110

1. INTRODUCTION

With an annual gross domestic product (GDP) of 18 trillion USD (World Bank, n.d.) and an import rate of approximately 53% of total energy consumption, the European Union (EU) remains the world's largest energy importer (EUROSTAT, n.d.). Against this backdrop, declining fuel reserves such as North Sea oil and gas (BP, 2015) have heightened awareness (Ganser, 2015. p. 197) of the vulnerability associated with the already elevated level of dependence on maintaining a constant supply of hydrocarbons and other forms of energy from abroad (Nies, 2011. p. 11). To increase energy security, the EU calls for a transformation of the EU's energy system (European Commission, 2014a; 2015a; 2011). This strategy includes cooperation among EU Member States at the regional level (European Commission, 2015a. p. 5) and the integration of regional energy systems (Turşie, 2015. p. 4). Member States are therefore asked to enhance regional cooperation when developing their energy policies (European Commission, 2014a. p. 13) and to develop adequate technical infrastructure such as redundancies, networks, and alternative supply routes (SWP, 2015. p. 3).

The Baltic Sea region serves as a blueprint for this (macro-) regional approach (European Commission, 2014b. p. 2) and can be regarded as an important test case for regional cooperation in the field of energy. Initiatives such as the Baltic energy market interconnection plan are hence expected to result in lessons on the basis of which the governance of other macro-regions can be built (European Commission, 2015a. p. 10-11). Furthermore, developments such as Lithuania's gas deal with Norwegian Statoil and Estonia receiving its first gas delivery via regional cooperation, from Lithuania through Latvia, are considered good examples of the benefits of regional energy initiatives (Hedberg, 2015. p. 1).

The EU represents an association of nations with diverse political-economic configurations (Brinegar et al., 2004. p. 62). In the energy sector, various historical-technological and economic legacies form a patchwork of energy systems, ownership structures, and regulatory responsibilities (Van der Vleuten and Högselius, 2012. p. 75). Within this structure, common European policies will change the relative position of individual countries along various energy-related dimensions (Coccia, 2010) - including jobs, industries, and capital investment[1]. As energy de facto remains a national competence (Helm, 2014. p. 29), it is reasonable to assume that national governments and major actors in national energy sectors define a national position to protect national economic assets. As a result, a cleavage exists between the goals of common European energy policy, on the one hand, and the strategic behaviour of the players involved, on the other (Pointvogel, 2009. p. 5704; Szulecki et al., 2016; Maltby, 2013. p. 441-442).

Hence, the geoeconomic implications of EU energy policy make any initiative seeking increased cooperation a difficult task (Scholten et al., 2015). Through a case study, the aim of this article is to evaluate the prospects for closer coordination of national energy policies at the regional level, namely the Baltic Sea region. In view of its increasing importance for common policies at the macro-regional level within the EU, and its role as a transit zone for a significant share of Europe's energy supply, this geographic area represents an excellent test case for this evaluation.

Given the strong position of Member States in energy policy and the close links between states and their national energy industries, the assumption that geoeconomic statecraft still plays a role in intra-European affairs represents the theoretical starting point for this article (Section 3). Influence over (regional) energy flows has been identified as one of the main tools of geoeconomic statecraft (Blackwill and Harris, 2016. p. 85-87). As most European countries depend on energy imports, this article focuses on the influence of being an energy importer on regional energy flows. By studying the levers whereby individual countries can affect regional energy, this article derives insights into the impediments and opportunities associated with regional policy coordination. To provide the necessary background information for this study, this article first visualises energy flows in the Baltic Sea region. Against this backdrop, an assessment of Poland and Germany's positions in this system is presented and the impact of their national energy policies on the regional energy system is evaluated. Finally, potential avenues for coordination between the two countries in the regional energy system are assessed.

2. LITERATURE REVIEW

Recently, the importance of spatial patterns and geography in determining energy policy goals has been highlighted, as they are critical factors for the integration of regional energy markets (Boffa and Sapio, 2015. p. 421). This growing importance of a regional approach to policy (-making) is reflected by a growing interest in geographical approaches in a more general sense, for example geographical political economy (Sheppard, 2011) or economic geography (e.g., Malecki, 2015). The geography of energy (e.g., mapping and modelling) was typically considered a task of the latter field, but has now emerged as an interdisciplinary field that spans all economic sectors and possesses extraordinary political influence (Hamhaber, 2015). Mañé-Estrada's discussion of a European geo-energy space is a good example of this new centrality of geography (Mañé-Estrada, 2006). Moreover, the interest in the energy transition as a geographical process (Bridge et al., 2013) or the explicit (World Economic Forum, 2015) or implicit (Prange-Gstöhl, 2009) discussion of geo-economics (of energy) - A rising paradigm in the analysis of foreign and economic policies and the evaluation of national interests (Martikainen and Vihma, 2016) - accord with this development.

The Baltic Sea region plays a unique role at the European level because after the EU launched its Strategy for the Baltic Sea region in 2009, the EU began to succumb to a macro-regional fever (Dühr, 2011. p. 3). Only 2 years later, in 2011, the construction and inauguration of the first line of the highly controversial Nord Stream pipeline shifted the focus of public attention further towards the Baltic Sea region (Scholten et al., 2015. p. 3). Moreover, with NATO establishing its Centre of Excellence for Energy Security in Vilnius (Kasekamp, 2014. p. 138) and the geopolitical shifts that have occurred since 2014 (De Jong et al., 2015. p. 1), the entire area remains part of the broader discussion concerning regional integration, cohesion, and security.

Given its growing importance, it is unsurprising that numerous articles address the Baltic Sea region, discussing, among other subjects, the following examples:

- Individual energy sectors (e.g., Norvaiša and Galinis, 2016)
- Forms of energy (e.g., Liuhto, 2015)
- Supply lines (Richter and Holz, 2015)
- Russian gas supplies and Europe's vulnerability to supply cuts (Paltsev, 2014; Smith-Stegen, 2011)
- Shale gas (Johnson and Boersma, 2013); and
- The policies of individual countries (Ydersbond, 2014).

However, the most recent complete data on energy flows in the region date to 2007/08 (Rostoks and Sprūds, 2009), and no article written since discusses the region's energy system in a holistic fashion based on the latest data.

3. THEORETICAL ASSUMPTIONS: THE GEOECONOMICS OF ENERGY

Although the advantages of policy coordination and closer integration appear beneficial to many actors, regional energy policy also implies risks for national industries. Not only is it possible that certain economic activities within the energy sector will be reallocated to the disadvantage of certain market players, but such shifts might also affect the wider spatial organisation of local, regional and global economies (Bridge et al., 2013). European energy policy makers therefore face (the inconvenient

1 Germany's pioneering role and heavy investments in the renewable energy industry and its position as one of the world's leading producers of wind turbines and solar energy technology, have, for example, been interpreted as a strategic move to benefit German business in the long run (Kausch, 2011. p. 47).

truth of) geoeconomics, an economic form of realism or commercial Realpolitik similar to that of political realism (Szabo, 2015. p. 7).

According to this theoretical perspective, the causes, as well as the instruments, of political conflict are located in the economic arena; there, political clashes are fought with the weapons of commerce (Luttwak, 1990. p. 128) and the control of markets (Moisio and Paasi, 2013. p. 268). Private companies may, for example, find themselves competing with foreign competitors determined to undercut and drive them out of business, which are amply funded for that purpose by their state authorities (Luttwak, 1990. p. 129). Geoeconomically active states will oppose such developments with the necessary policies and oppose both rival foreign states and private foreign companies that are the chosen instruments of those rivals (Ibd.). Geoeconomics is hence shorthand for a complex notion: The intersection of economics with political and security considerations (Kubarych, 2004), resulting in statecraft as an economic form of realism or commercial Realpolitik (Szabo, 2015. p. 7).

Geoeconomics is particularly notable in the energy sector. Given the limitations of European energy policy and the strong role of Member States in this field (see introduction), it can be expected that geoeconomically motivated statecraft still plays an important role in European energy policy, even under the common EU umbrella. The replacement of domestic fossil fuel (e.g., coal) with renewables will, for example, shift generation capacity and control over power flows to those countries that have access to better and more sources of renewable energy, can offer better incentives for expanding capacity, and/or can exploit them more cost-efficiently. Market integration, moreover, implies that new competitors to domestic producers will emerge and that electricity companies that are not efficient enough to withstand competition in a European market will experience distress, whereas other utilities (including foreign ones) will be able to strengthen their market position. Moreover, diversification of energy imports will lead to altered entry points, for example new LNG terminal capacity; some member States might therefore perceive risks of losing power generation capacity (and energy-intensive industry) to regions closer to new entry points.

Given the strong links between the energy sector and national governments, it is reasonable to expect that individual Member States and the major stakeholders in their energy sectors will develop national strategies to avoid the loss of, for example, capacity, market shares, and control over energy flows (Luttwak, 1990. p. 129). Important in this regard is the notion that the negative side of geoeconomic statecraft (e.g., supply cuts, sanctions; the proverbial "stick") is complemented by a positive side, that is, measures that include or lead to mutual economic interest (e.g., price cuts, side-payments or asset swaps; the "carrot;" Wigell and Vihma, 2016. p. 608). Depending on the individual, cross-border circumstances and configurations of interests, the geoeconomic-strategic positioning of Member States can therefore be expected to be either disruptive or conducive to the aims of common European energy policies.

4. THE BALTIC ENERGY SYSTEM

The results of this analysis vary with the precise definition of the geographical scope of the Baltic Sea region. If the whole territory of the Baltic Sea littoral states is included[2], the region is rich in energy resources, with an annual average surplus of primary energy production of 500.2 mtoe (million tonnes of oil equivalent; Annex Table 1). Unsurprisingly, the distribution of available energy resources is unequal; yet with only three countries - Denmark (2010-2012 average surplus of 1.7 mtoe), Norway (2010-2012 average surplus of 169.6 mtoe) and Russia (2010-2012 average surplus of 602.5 mtoe) - having a positive balance between energy consumption and production with the others having insufficient access to indigenous energy sources, there is a strong disequilibrium.

The energy supply gap of those countries[3] with limited access to indigenous energy hence amounts to a (2010-2012) average of −273.7 mtoe. If this (positive or negative) balance is compared against the gross energy consumption of individual countries, the seriousness of this imbalance becomes clear: With the exception of the three net exporters, the countries of this region are far from being able to produce indigenous energy in amounts sufficient to supply their domestic economies (Figures 1 and 2). As a consequence, energy exports from Norway and Russia to EU Member States in the Baltic Sea region represent, by far, the largest energy flows in the area.

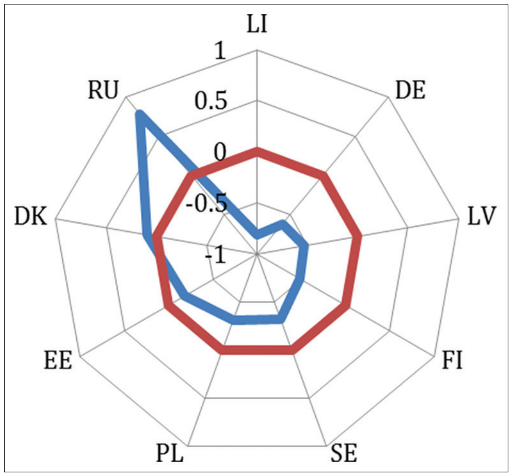
Including the totality of energy flows between the littoral states of the Baltic Sea, however, extends far beyond the geographical borders of the Baltic Sea region. Germany's national energy system, for example, is located at the crossing point of several major Euro-Eurasian energy regions (Högselis et al., 2013. p. 56), and only parts of its imports originate from the Baltic Sea region in a narrow geographical sense: German gas and oil imports from Norway come from fields in the North Sea and cross that sea through different pipelines (via Europipe I, Europipe II, and Norpipe). From their entry points to the national German system - located at the shores of the North Sea - Norwegian gas and oil then predominantly supply areas in North-Western Germany (such as the Ruhr), which cannot be described as part of the Baltic Sea region.

This analysis therefore follows the definition of the Baltic Transnational Cooperation (or INTERREG) area (European Commission, 2007. p. 22; Figure 3). In the strict geographical sense, Norwegian and Russian gas and oil supplies can hence only partly be attributed to the Baltic Sea region (also Högselis et al., 2013. p. 56) and thus have to be partly excluded from the following analysis. As noted above, this affects primarily Norwegian energy exports to Germany. Matters concerning energy from Russia are more complicated, as parts of the transit system are part of the Baltic energy system (Nord Stream, Yamal/Europol), whereas

2 The following countries are included in this analysis: DE (Germany), DK (Denmark), EE (Estonia), FI (Finland), LI (Lithuania), LV (Latvia), NO (Norway), PL (Poland), SE (Sweden), and RU (Russia).

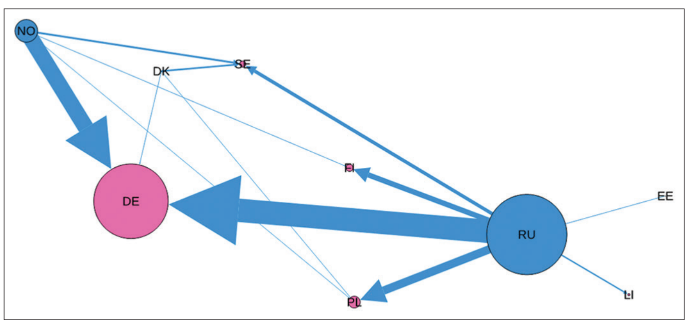
3 Estonia, Finland, Germany, Latvia, Lithuania, Poland and Sweden.

Figure 1: Indigenous energy supply of countries in the Baltic Sea region



Source: EUROSTAT online energy statistics, complete energy balances, Table nrg_110a (2010-2012 average), EIA total primary energy production (2010-2012 average). Note: Red represents the margin of energy production equalling national consumption; blue represents the energy resources of individual countries, ranging between −1 (no [use of] indigenous energy or limited capacity) and +1 (capacity to fully supply the national economy with indigenous energy plus export capacity). Norway has been excluded from this graph (index: 5.589)

Figure 2: Who creates and who fills the regional energy gap?



Source: EUROSTAT online energy statistics, complete energy balances, table nrg_110a (2010-2012 average), EIA total primary energy production (2010-2012 average). Note: Energy deficit (pink nodes: Regional energy deficit; Annex Table 2), energy surplus (blue nodes: Regional energy surplus; Annex Table 2), and energy flows (blue arrows: Energy exchange; Annex Table 3) are depicted[4]. Latvia has not been included in this Figure 2[5]

others (e.g., Brotherhood) pass through more southern regions. The annual transport capacities of individual pipelines[6] and actual gas flows in these pipelines[7] suggest that an estimated 50% of Russia's gas and oil supply to the West passes through the Baltic Sea region. The following analysis thus includes the 50% of Russian oil and gas supply to Germany passing through the Baltic Sea region. Russian oil and gas supplies to other countries in the region, however on, including Poland, are fully included in the analysis.

Accounting for approximately 79% of energy flows in the region, Russia's dominance remains largely unchanged in this narrower definition of the Baltic Sea region. However, with Norwegian supplies to Germany excluded and Russian exports reduced by 50%, it is possible to provide a detailed image of the interplay between the national energy systems (Figure 4). From this perspective, Norway's role as an energy exporter is much less significant; while natural gas is likely the most prominent form of energy in the public discourse on the region, its actual share is relatively small compared with other forms of energy traded, shipped and transmitted in and through the area. Depending on the share of coal among solid fuels[8], natural gas might even rank third. Moreover, the size of electricity flows in the region needs to be addressed, as their relatively small share indicates that electricity generation continues to have a very strong national basis.

5. GERMANY AND POLAND IN THE BALTIC ENERGY SYSTEM

Large shares of both German and Polish energy imports come from or pass through this region. The Baltic Sea region therefore is of strategic importance to both countries' national energy security. This section evaluates the positions of the two countries in the regional energy system.

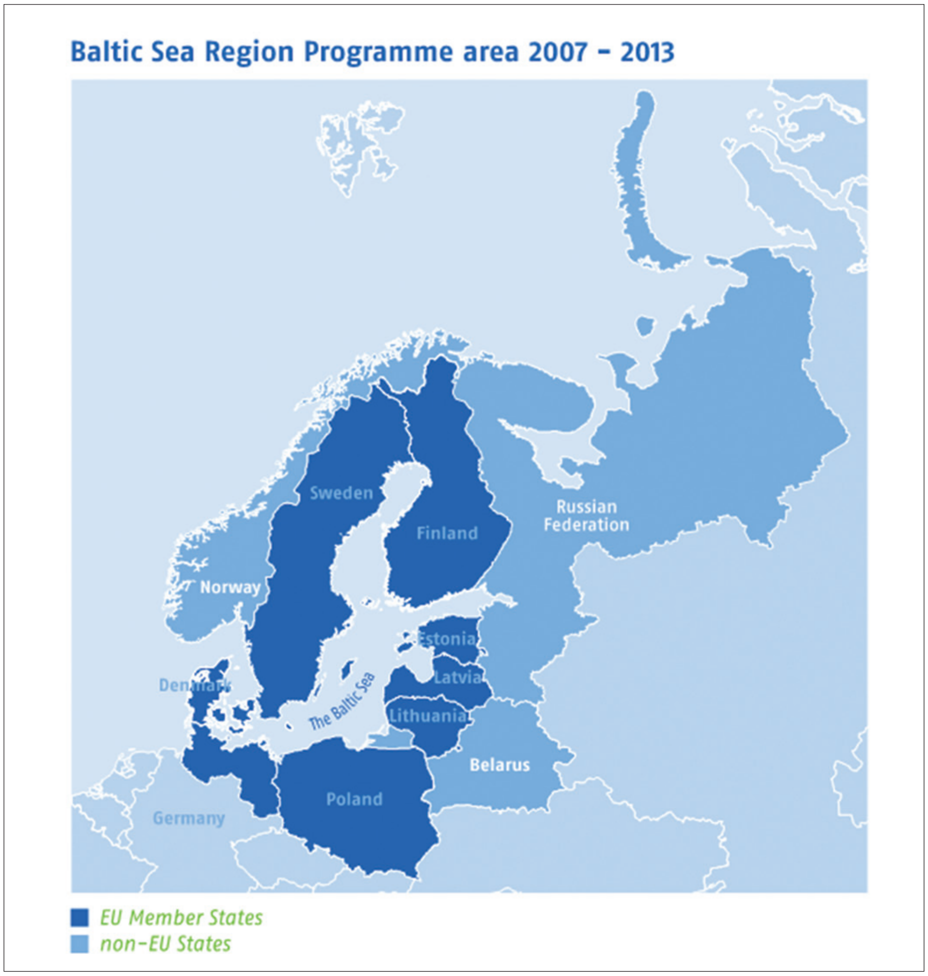
5.1. Germany

Germany has among the lowest ability to rely on indigenous energy among the countries in the Baltic Sea region (Figure 1). Given the size of its economy, Germany is thus confronted with a tremendous (2010-2012 average) energy gap of −198.1 mtoe, equal to 72.38% of the combined energy supply gap of the Baltic Sea littoral states (Figure 2). Germany is irrelevant as an energy exporter[9], yet with 95.3 mtoe - or 48.13% - of necessary imports to fill the country's energy gap coming from the Baltic Sea littoral states, Germany plays an important role as an energy importer[10]. In this broad definition, the Baltic Sea region can thus be described as the backbone of Germany's energy supply. Regarded from a narrow geographical perspective (Section 2), the Baltic Sea region, however, loses some importance for Germany's energy security: In this view, some 57.6 mtoe - A considerably smaller 29.1% share of the German supply gap - come from or pass through the Baltic area.

In other words, the Baltic Sea region's importance for Germany's energy sector diminishes if the analysis is based on a narrow geographical understanding of the area. Moreover, adopting the

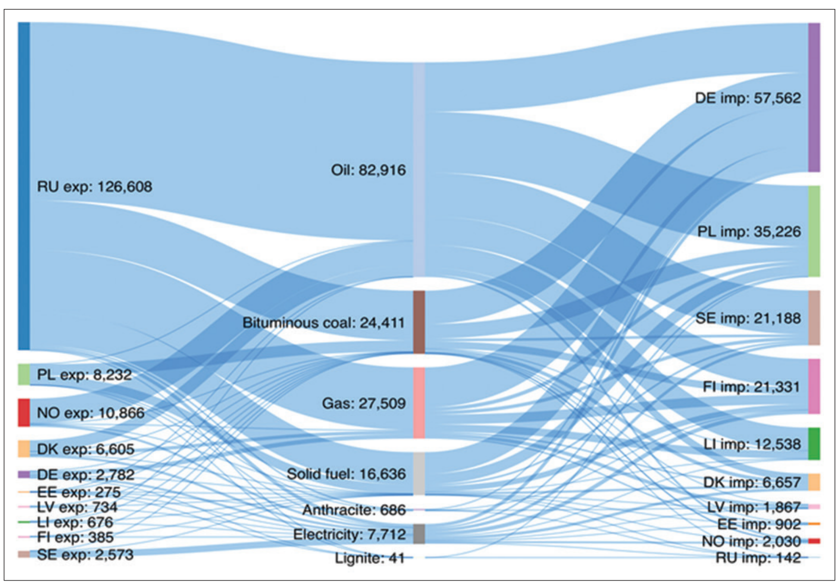
4 Computed with Gephi, ForceAtlas2.
5 According to Eurostat data, Latvia did not import energy from the region's main energy suppliers in the time period 2010-2012.
6 The annual pipeline capacities are as follows: Brotherhood 100 bcm/year; Yamal 33 bcm/year; and Nord Stream 55 bcm/year (Gazprom Export, 2015).
7 In 2013, gas flows were as follows: Brotherhood 59 bcm; Yamal 34 bcm; and Nord Stream 23.5 bcm (see CIEP n.d.).
8 Eurostat does not provide a clear definition of the term 'solid fuel' (for a definition, OECD and IEA 2004. p. 109).
9 Given the decision to phase-out economic support for hard coal mining by 2018 (Auer and Anatolitis, 2014. p. 7), it is even more likely that Germany's already limited role as an exporter will not change.
10 German energy imports from the Baltic Sea littoral states (as a% of the national supply gap) are as follows: RU: 31.33; NO: 15.6; DK: 0.89; FI: 0.03; LI: 0.04; PL: 0.11; SE: 0.08.

Figure 3: The Baltic Sea (INTERREG) region



Source: European commission, 2007. p. 22

Figure 4: Energy flows in the Baltic Sea region (in ktoe)



Source: EUROSTAT online energy statistics, imports, tables nrg_122a, nrg_123a, nrg_124a, nrg_125a (2010-2012 average). Note: This graph follows a narrow geographical definition of the Baltic Sea region; energy exports from Norway and 50% of exports from the Russian Federation to Germany have been excluded (see above). The calorific values used for the conversion of Eurostat data on different forms of energy to ktoe are anthracite 35 MJ/kg; bituminous coal 29.5 MJ/kg; Lignite 17.5 MJ/kg; and solid fuel 20.65 MJ/kg (OECD and IEA 2004, 109). For polish gas imports, see footnote 12

Table 1: Energy exports from the Baltic Sea region to Germany (in mtoe, rounded)

Exp.	Oil	Gas	Anthracite	Bituminous coal	Electricity	Solid fuel	Lignite
DK	1.28	0	0	0	0.49	0	0
EE	0	0	0	0	0	0	0
FI	0	0	0	0	0	0.01	0
LI	0.09	0	0	0	0	0	0
LV	0	0	0	0	0	0	0
NO	0	0	0	0	0	0	0
PL	0.20	0	0.05	3.91	0.02	3.10	0
RU	17.31	15.44	0.44	8.96	0	5.27	0
SE	0	0	0	0	0.78	0	0
Sum	18.88	15.44	0.49	12.87	1.29	8.38	0

Source: EUROSTAT online energy statistics, imports, tables nrg_122a, nrg_123a, nrg_124a, nrg_125a (2010-2012 average). This table follows a narrow geographical definition of the Baltic Sea region; energy exports from Norway and 50% of exports from the Russian Federation to Germany have been excluded

narrow geographical perspective sheds new light on the importance of individual energy sources: While natural gas attracts the bulk of attention in the energy-related public discourse on the Baltic Sea region, its actual share is small relative to other energy sources such as oil and the different forms of coal (Table 1). Compared to oil, gas is only the second most important type of energy either coming from the littoral states or through the Baltic Sea to Germany, and the coal supply coming from or transiting through the Baltic region is at least of equal size, depending on the share of coal among solid fuels. Electricity imports to Germany represent a relatively small share compared to other energy types.

5.2. Poland

In absolute terms, the Polish energy supply gap is significantly smaller than Germany's (Figure 1); thus, Poland is among those countries coming nearer to achieving a balance between energy production and energy consumption. Yet, with −31.3 mtoe (2010-2012 average), its energy supply gap remains significant, amounting to 11.45% of the region's combined energy gap (Figure 2). Despite its relatively rich domestic energy resources, Poland is the region's second largest importer of energy after Germany[11]. In contrast to Germany, the country's geographic situation makes the Baltic Sea region more important for Poland, because as they pass through the Baltic Sea region, Polish oil and gas imports from Norway and Russia remain part of the analysis, even if a strict geographical definition of the Baltic Sea region is applied (Table 2).

Hence, 24.9 mtoe - or 79.42% - of Poland's imports come from the littoral states of the Baltic Sea, according to EUROSTAT data on energy imports (Annex Tables 4 and 5)[12]. Thus, Poland's energy gap is smaller than Germany's in absolute terms, but due to the nature of Poland's supply lines, the Baltic Sea region is of greater relative importance for the Polish system. There is a notable imbalance with respect to individual types of energy: At 23.29 mtoe or 63.55% of all Polish energy imports, oil is by far the most important form of energy among all imports (Figure 5). In view of Poland's rich coal resources, it is surprising that Polish imports include relatively high amounts of bituminous and other forms of coal (approximately 9.686 mtoe or up to 26% of all energy imports from the region, if solid fuels are included). Electricity imports play only a marginal role.

11 With a 5.97% share of the region's supply gap, Sweden ranks third.

12 Polish energy imports from the Baltic Sea littoral states (as a percentage of the national supply gap) are as follows: RU: 69.69; DE: 5.63; NO: 3.56; SE: 0.45; DK: 0.09.

6. DOMESTIC POLICIES AND THE BALTIC ENERGY SYSTEM

To discuss the positions of Germany and Poland in the Baltic energy system and the prospects for closer cooperation and integration, an evaluation of national energy policies and their likely impact on energy flows in the region is required. Energy consumption may serve as a starting point.

6.1. Germany

German energy policy, particularly its so called Energiewende, is directed at distinctively changing central elements of the country's energy system (BMWi, 2014a. p. 11): The share of renewables in Germany's gross energy consumption is to be increased substantially, while the use of fossil and nuclear energy is to be decreased. Although Germany's position as a net importer is unlikely to change[13], the Energiewende might alter the country's position as the region's main energy importer, depending on the actual development of demand for individual forms of energy in Germany and the region as a whole. Future demand in Germany is, however, largely unclear at the moment because both, technically and economically, the Energiewende poses a number of complex and unresolved challenges such as limited storage capacity and erratic power flows.

These challenges have resulted in a number of paradoxes in Germany's energy position: For example, flexible gas and biomass power plants are regarded as a technological opportunity to balance the power system despite growth in intermittent renewables. As the case of Europe's most recent gas power plant in Irsching (FAZ, 2015)[14] illustrates, investments in state-of-the-art equipment and turbines becomes unprofitable under the economic conditions resulting from the Energiewende; moreover, German companies are pressing forward with plans to expand the Nord Stream Pipeline from Russia to Germany (Polak, 2015. p. 3). The development of Germany's gas imports therefore depends on future political choices. The outcomes of the on-going discussion (BMWi, 2014b) will certainly affect Germany's demand for coal and gas.

13 Electricity may become the exception to this rule, as the increased recourse to electricity generation from renewable sources might exacerbate network fluctuations.

14 This ultramodern gas-fired power plant, equipped with an advanced and efficient turbine from Siemens, might be forced out of business by heavy price competition from solar power.

Table 2: Energy exports from the Baltic Sea region to Poland (in mtoe, rounded)

Exp.	Oil	Gas	Anthracite	Bituminous coal	Electricity	Solid fuel	Lignite
EE	0	0	0	0	0	0	0
DE	0	1.43	0	0.004	0.47	0.039	0.02
DK	0	0	0	0	0	0	0
FI	0	0	0	0	0	0.001	0
LI	0	0	0	0.004	0	0.003	0
LV	0	0	0	0	0	0	0
NO	1.13	0	0	0.008	0	0.006	0
RU	22.16	1.63[15]	0	5.63	0	3.97	0.001
SE	0	0	0	0.001	0.14	0	0
Sum	23.29	3.06	0	5.647	0.61	4.018	0.021

Source: EUROSTAT online energy statistics, imports, tables nrg_122a, nrg_123a, nrg_124a, nrg_125a (2010-2012 average)

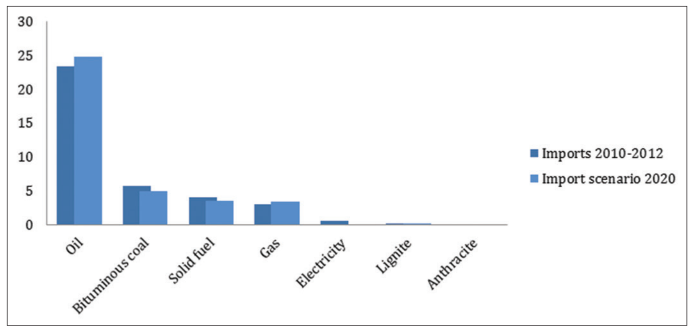
Despite these uncertainties regarding the future course of German energy policy, the impact of the Energiewende programme on the energy system of the Baltic Sea region can be estimated, at least to a certain degree. Based on the Prognos/EWI/GWS energy scenario from 2010 (Prognos, EWI, GWS, 2010), Germany's energy imports from and/or through the Baltic Sea region can be expected to decrease slightly, by 14.5%, to 49.25 mtoe by the year 2020 compared to the 57.6 mtoe average for the period 2010-2012 (Section 3). This reduction in energy imports accounts for all forms of energy, but the extent of the reduction varies considerably across energy types (Figure 6). As the actual trajectory depends on future policy choices, the results of this analysis can only be regarded as preliminary.

6.2. Poland

European energy policy and energy security issues have been identified as driving forces behind Polish energy policy (IEA, 2011. p. 30). The relationship between these two factors is not without contradictions. The dominant role of bituminous coal and lignite (which jointly account for more than 55% of Poland's primary energy supply) has been characterised as particularly problematic in this regard, as coal represents a source of energy security (Ibd.) but limits Polish initiatives in areas such as climate policy (Fischer, 2011. p. 76). Thus, rich coal deposits can be regarded as the explanation for the discrepancy between political declarations to follow European initiatives (in areas such as climate policy) and vested interests, which limit the on-going modernisation process through the strong emphasis on conventional forms of energy (Rosicki, 2015. p. 53-54).

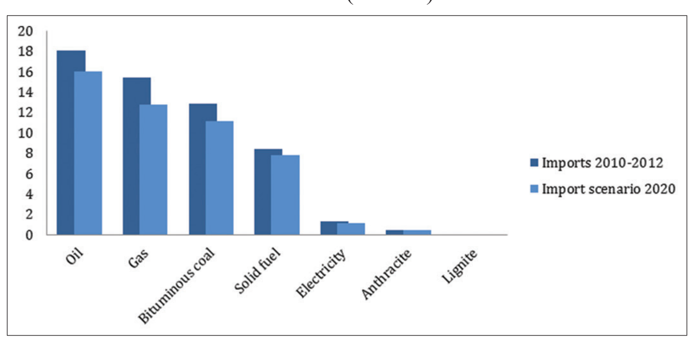
15 Eurostat data table nrg_124a, imports-gas-annual data reports Polish gas imports from Russia in the years 2010, 2011 and 2012 of 115, 105, and 189 terajoules, or 3, 3, and 5 million m^3. As a three-year average, Eurostat reports 1.63 ktoe of Polish gas imports from Russia. The average imports in previous years are reported by Eurostat to be 260,553 (2007), 295,677 (2008), and 311,174 (2009) terajoules, and 6,855 (2007), 7,783 (2008), and 8,166 (2009) million m^3. No reason is given for the strong difference between the 2010-2012 period and previous years. The U.S. Energy Information Administration EIA (table imports, dry natural gas) reports Polish imports of 385 (2010), 416 (2011), and 433 (2012) billion cubic feet, while in the same time period, Germany imported 3,321 (2010), 3,266 (2011), and 3,001 (2012) billion cubic feet according to these data. The BP Statistical review of world energy 2015 workbook reports Polish gas imports from Russia of 8.9 billion m^3 and German gas imports of 38.5 billion m^3. The Eurostat data hence appear to be flawed. Instead of the average 1.63 ktoe calculated for Polish gas imports from Russia on the basis of Eurostat data, a value of 1.63 mtoe is assumed in this table. Note: Graph 3 contains data as reported by Eurostat.

Figure 5: Energy imports of Poland, 2010-2012 average and 2020 scenario (in mtoe)



Sources: EUROSTAT online energy statistics, imports, tables nrg_122a, nrg_123a, nrg_124a, nrg_125a (2010-2012 average), and Energy Policy of Poland until 2030 (EPP2030), Appendix 2, projection of demand for fuels and energy until 2030, p. 15. Note: 2020 import scenario is calculated on the basis of the average annual percentage change in energy demand over the period 2006-2020 as indicated in EPP2030; solid fuel represents an average of bituminous coal and lignite

Figure 6: Energy imports of Germany 2010-2012 average and 2020 scenario (in mtoe)



Source: EUROSTAT online energy statistics, imports, tables nrg_122a, nrg_123a, nrg_124a, nrg_125a (2010-2012 average), and prognos, EWI, GWS 2010, average of individual scenarios IA – IVB, Annex 1-9. Note: The 2020 import scenario is calculated on the basis of the average annual percentage change in energy imports over the period 2008-2020 indicated in prognos, EWI, GWS 2010; the reference scenario is not included; solid fuel represents an average of bituminous coal and lignite

Similarly, the country's situation in the regional energy system places Polish energy policy at something of a crossroads: On the one hand, dependency on oil and gas imports represents a historical and geographic legacy that until recently has provided few alternatives to Russian imports and thus implied a strong incentive for policy makers to diversify suppliers; on the other hand, the presence of important transit infrastructure in Poland for Russian energy exports to Western Europe offers the country some leverage in political and economic negotiations. Recently, the finalisation of the Świnoujście LNG terminal, with processing capacity equal to approximately 50% of the country's annual demand, substantially increased Polish energy security, whereas the potential extension of the Nord Stream pipeline through the Baltic Sea might further limit Poland's importance as a transit country.

Polish support for European initiatives on energy market integration might also limit the historical-geographic legacy of the country's energy system, and improved energy efficiency might increase energy security. Until recently, the Polish economy's energy intensity was approximately 20% higher than the European average (Fortum, 2011. p. 4), but Poland's focus on energy efficiency measures (Rosicke, 2015. p. 56) seems to have had sustainable results: When comparing the trend of primary energy consumption with that of GDP in recent decades, evidence of a relatively strong decoupling can be observed (European Commission, 2015b. p. 5). Energy demand might hence remain stable, despite continuing economic growth.

Other national policies, such as the exploitation of indigenous shale gas and the construction of new nuclear plants and the necessary grid infrastructure, have been less successful but might reduce demand for gas and coal. The remaining contradictions contained in Poland's energy system make formulating a concise energy strategy a demanding task, but the country's consistent and strong focus on energy policy show interesting results. Based on the Energy Policy of Poland until 2030 document (Ministry of Economy, 2009. p. 13), it is possible to estimate how various Polish energy policies will affect the Baltic energy system (Figure 5). Ultimately, with a calculated 36.65 mtoe in 2020, Polish energy imports from the Baltic Sea region will remain remarkably stable, compared to the 36.64 mtoe average for the period 2010-2012 (Section 3).

7. DISCUSSION

Unsurprisingly, the distribution of energy resources in the Baltic Sea region is highly uneven, with most countries exhibiting supply gaps of varying sizes; of the ten countries covered by the analysis, only three are net exporters, two of which show the capacity for significant exports. In the study's narrow geographic focus, Norwegian oil and gas exports lose much of their importance; Russia's predominance is, however, unquestioned, even when adopting a narrow perspective on the energy system of the Baltic Sea region. In view of the considerable amounts of oil and coal from the Russian Federation that passes through the Baltic Sea area, the role attributed to natural gas in the public discourse appears to be somewhat overestimated. An analysis of the geoeconomics of energy in the Baltic Sea region should therefore include energy flows other than natural gas. Beyond the oil and coal, electricity should also be included because the obviously small fraction of this form of (secondary) energy in the regional energy system suggests the potential for tremendous increases in bilateral exchanges.

Being the region's largest importer, Germany's energy imports from or through the Baltic amount to some 36% of gross energy consumption in the Baltic Sea region (Figure 4). Therefore, any change in the German system of energy production and consumption will have a noticeable effect on energy flows in the region. Germany's Energiewende – which represents a radical transformation of the county's energy system – has to be seen in this light because Germany's imports from or through the Baltic Sea region can be expected to decrease as a result of this policy (to 49.25 mtoe, Figure 6). Moreover, the percentage of German imports from the Baltic Sea region to fill Germany's national energy gap is already small relative to those of other countries. As exerting influence on energy flows is one of the tools of geoeconomic statecraft, this combination of factors gives Germany access to a strong geoeconomic lever: Import reduction.

In comparison with Germany, Poland's import structure places it in a somewhat weaker geoeconomic position in the regional energy system. Energy imports from or through the Baltic Sea region amount to 21% of total imports in the region, making Poland the second largest importer in the area (Figure 4). The country's energy market is thus comparatively smaller than Germany's. Moreover, with a steadily growing economy, Polish policy makers perceive little opportunity for decreasing energy imports; Polish energy imports will hence remain relatively stable in the coming years (at approximately 36.65 mtoe; Figure 5). As a result, Poland's ability to influence regional energy flows by reducing its imports is comparatively weak. In addition, Poland's reliance on energy imports from or through the Baltic Sea region to close the country's energy gap is and will remain relatively high. Consequently, the Baltic Sea region will further lose importance for Germany's energy supply, whereas its significance for Poland will remain high.

8. CONCLUSIONS AND POLICY IMPLICATIONS

In the case of Germany, the ability to reduce energy imports for the country's own consumption can be interpreted as a (potential) tool to influence energy flows in the Baltic Sea region. The question is whether and to what purpose Germany will employ this geoeconomic lever. As the Nord Stream pipeline might be expanded in coming years, Germany could, for example, increasingly play the role of a transit hub for energy from the Baltic Sea region. Such a development would considerably improve Germany's position relative to other EU Member States. Polish ability to leverage energy flows in the Baltic Sea region instead results from the fact that the country's relative position in the regional energy system will change over time: At present, energy imports amount to 21% of combined imports in the region, but with Germany being able to reduce its national consumption, Poland will become more important as a regional energy market, despite imports remaining stable in absolute terms.

Turning to the broader picture, when accounting for all forms of energy, greater attention should be devoted to the flows of oil, coal and electricity in the Baltic Sea region. Consequently, the future of transport and electricity might be decisive for the future geoeconomic balance between Poland and Germany and the potential for increased cooperation between the two countries on energy issues. In this regard, the automobile industry could be the link that brings the energy policies of both countries into closer alignment. The mass production of electric vehicles might not only reduce both countries' dependence on oil imports (an end sought by both countries) but also demand closer integration of power generation systems to increase energy security. With the automobile industry being an important economic factor in Germany and Poland, important players might also be in favour of such a development.

Clearly, the different approach to electricity generation - primarily renewables in Germany and coal (and potentially nuclear power) in Poland - will require intensive negotiations to develop the technological and market conditions necessary for closer integration. However, a potential reduction in oil imports and increased energy security through greater integration of power systems might be a sufficient incentive to enable closer future cooperation between Germany and Poland on energy issues, despite certain geoeconomic frictions between the two states. It follows that closer coordination of national energy policies in the Baltic Sea region is difficult yet achievable - If the included parties are capable of finding common ground that is currently hidden by the entrenched geoeconomic positions of individual countries.

9. ACKNOWLEDGEMENTS

This publication has been prepared as part of the research project "Towards a common European energy policy? Energy security debates in Poland and Germany," which has received financial support from the German-Polish Science Foundation.

REFERENCES

Auer, J., Anatolitis, V. (2014), The changing energy mix in Germany. The drivers are the Energiewende and international trends. Deutsche Bank Research, Current Issues, June 26, 2014.

BP. (2015), Statistical Review of World Energy. London: BP.

Blackwill, R.D., Harris, J.M. (2016), War by Other Means. Geoeconomics and Statecraft. Cambridge: The Belknap Press of Harvard University Press.

BMWi. (2014a), Zweiter Monitoring-Bericht, Energie der Zukunft. Berlin: Bundesministerium für Wirtschaft und Energie BMWi.

BMWi. (2014b), An Electricity Market for Germany's Energy Transition. Discussion Paper of the Federal Ministry for Economic Affairs and Energy (Green Paper). Berlin: Bundesministerium für Wirtschaft und Energie BMWi.

Boffa, F., Sapio, A. (2015), Introduction to the special issue "The regional integration of energy markets". Energy Policy, 85, 421-425.

Bridge, G., Bouzarovski, S., Bradshaw, M., Eyre, N. (2013), Geographies of energy transition: Space, place and the low-carbon economy. Energy Policy, 53, 331-340.

Brinegar, A., Jolly, S., Kitschelt, H. (2004), Varieties of Capitalism and political divides over European integration. In: Marks, G., Steenbergen, M., editors. European Integration and Political Conflict. Cambridge: Cambridge University Press. p62-89.

CIEP. (n.d.), Russian Gas Imports to Europe and Security of Supply. Fact Sheet. Clingendael International Energy Programme.

Coccia, M. (2010), Energy metrics for driving competitiveness of countries: Energy weakness magnitude, GDP per barrel and barrels per capity. Energy Policy, 38, 1330-1339.

De Jong, S., Widdershoven, C., Kertysova, K., Miladinova, V., Auping, W. (2015), Running out of gas – Natural gas diversification efforts in the EU neighbourhood. Oil, Gas and Energy Law Intelligence, 13(6), 1-22.

Dühr, S. (2011), Baltic Sea, Danube and Macro-regional Strategies: A Model for Transnational Cooperation in the EU? Studies and Research 2011. New York: Notre Europe.

European Commission. (2007), Cohesion Policy 2007-13. Commentaries and Official Texts. Luxemburg: Office for Official Publications of the European Communities.

European Commission. (2014a), Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions. A Policy Framework for Climate and Energy in the Period from 2020 to 2030, COM(2014) 15 Final, Brussels, 22/01/2014.

European Commission. (2014b), Report from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions Concerning the Governance of Macro-Regional Strategies, COM (2014) 284 final, Brussels, 20/05/2014.

European Commission. (2015a), Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee, the Committee of the Regions and the European Investment Bank. A Framework Strategy for a Resilient Energy Union with a Forward-Looking Climate Change Policy, COM (2015) 80 Final, Brussels, 25/02/2015.

European Commission. (2015b), Commission Staff Working Document. Country Factsheet Poland. Accompanying the document Communication form the Commission to the European Parliament, the Council, the European Economic and Social Committee, the Committee of the Regions and the European Investment Bank. State of the Energy Union, SWD (2015) 234 Final, Brussels, 18/11/2015.

EUROSTAT. (n.d.), Energy Imports and Exports EU World. p15. Available from: http://www.ec.europa.eu/eurostat/statistics-explained/index.php/File: Energy_imports_and_exports_%28%C2%B9%29_EU_world15.png. [Last accessed on 2016 Jun 06].

FAZ. (2015), Energiewende. Irrsinn in Herrsching. Frankfurter Allgemeine Zeitung, March 17, 2015.

Fischer, S. (2011), Auf dem Weg zur gemeinsamen Energiepolitik. Strategien, Instrumente und Politikgestaltung in der Europäischen Union. Baden-Baden: Nomos.

Fortum. (2011), Energy Policy Review – Poland. Espoo: Fortum Corporation.

Ganser, D. (2015), Europa im Erdölrausch. Die Folgen einer gefährlichen Abhänggkeit. Zürich: Orell Füssli Verlag.

Gazprom Export. (2015), Transportation. Available from: http://www.gazpromexport.ru/en/projects/transportation/. [Last accessed on 2015 Feb 11].

Hamhaber, J. (2015), Energy, Geography. International Encyclopedia of the Social & Behavioral Sciences. 2nd ed., Vol. 7. New York: Elsevier. p633-640.

Hedberg, A. (2015), Europe's energy security – Is the Energy Union the Answer? EPC Commentary, European Policy Centre.

Helm, D. (2014), The European framework for energy and climate policies. Energy Policy, 64, 29-35.

Högselis, P., Aberg, A., Kaijser, A. (2013), Natural gas in cold war

Europe: The making of a critical infrastructure. In: Högselius, P., Hommels, A., Kaijser, A., van der Vleuten, E., editors. The Making of Europe's Critical Infrastructure. Common Connections and Shared Vulnerabilities. Basingstoke: Palgrave Macmillan.

IEA. (2011), Energy Policies of IEA Countries. Poland 2011 Review. Paris: International Energy Agency.

Kasekamp, A. (2014), The politics of energy and memory between the Baltic States and Russia. Journal of Baltic Studies, 45, 138-140.

Kausch, K. (2011), A geo-economic Germany? In: Martiningui, A., Youngs, R., editors. Challenges for European Foreign Policy in 2012. What Kind of Geo-Economic Europe? Madrid: FRIDE. p45-52.

Kubarych, R.M. (2004), Geo-economics Injects New Uncertainties into Troubled Markets. New York: Council on Foreign Relations.

Liuhto, K., editor. (2015), Natural Gas Revolution And the Baltic Sea Region, BSR Policy Briefing, January 2015. Centrum Balticum.

Luttwak, E.N. (1990), From geopolitics to geo-economics: Logic of conflict, grammar of commerce. In: Tuathail, G.Ó., Dalby, S., Routledge, P., editors. The Geopolitics Reader. London: Routledge. p125-130.

Malecki, E. (2015), Economic geography. International Encyclopedia of the Social & Behavioral Sciences. 2nd ed., Vol. 7. New York: Elsevier. p33-37.

Maltby, T. (2013), European Union energy policy integration: A case of European Commission policy entrepreneurship and increasing supranationalism. Energy Policy, 55, 435-444.

Mañé-Estrada, A. (2006), European energy security: Towards the creation of the geo-energy space. Energy Policy, 34, 3773-3786.

Martikainen, T., Vihma, A. (2016), Dividing the EU with energy? FIIA Briefing Paper 191, March, 2016, The Finnish Institute of International Affairs.

Ministry of Economy. (2009), Projection of Demand for Fuels and Energy Until 2030, Appendix 2 to Draft "Energy Policy of Poland Until 2030. Warsaw, 10 November, 2009.

Moisio, S., Paasi, A. (2013), From geopolitical to geoeconomic? The changing political realities of state space. Geopolitics, 18, 267-283.

Nies, S. (2011), Oil and Gas to Europe. An Overview of Existing and Planned Infrastructures. Paris: IFRI.

Norvaiša, E., Galinis, A. (2016), Future of Lithiuanian energy system: Electricity import or local generation? Energy Strategy Reviews, 10, 29-39.

OECD, IEA. (2004) Energy Statistics Manual. Paris: Organisation for Economic Co-Operation and Development, International Energy Agency.

Paltsev, S. (2014), Scenarios for Russia's natural gas export to 2050. Energy Economics, 42, 262-270.

Pointvogel, A. (2009), Perceptions, realities, concession – What is driving the integration of European energy policies? Energy Policy, 37, 5704-5716.

Polak, P. (2015), Europe's low energy. The Promise and Perils of the Energy Union. Foreign Affairs, September 9, 2015.

Prange-Gstöhl, H. (2009), Enlarging the EU's internal energy market: Why would third countries accept EU rule export? Energy Policy, 37, 5296-5303.

Prognos, EWI, GWS. (2010), Energieszenarien für ein Energiekonzept der Bundesregierung. Studie für das Bundesministerium für Wirtschaft und Technologie. Basel, Köln, Osnabrück: Prognos AG, Energiewirtschaftliches Institut an der Universität zu Köln, Gesellschaft für Wirtschaftliche Strukturforschung mbH.

Richter, P.M., Holz, F. (2015), All quiet on the eastern front? Disruption scenarios of Russian natural gas supply to Europe. Energy Policy, 80, 177-189.

Rosicki, R. (2015), The energy policy of Poland up to 2050 – A critical analysis. Środkowoeuropejskie Studia Polityczne, 13(1), 51-62.

Rostoks, T., Sprūds, A., editors. (2009), Energy: Pulling the Baltic Sea Region Together or Apart? Riga: Zinātne.

Scholten, D., Sattich, T., Ydersbond, I., Inderberg, T.H. (2015), Consensus, contradiction, and conciliation of interests: The geo-economics of the Energy Union, EPC Policy Brief, July 2015, European Policy Centre.

Sheppard, E. (2011), Geographical political economy. Journal of Economic Geography, 11, 319-331.

Smith-Stegen, K. (2011), Deconstructing the "energy weapon": Russia's threat to Europe as case study. Energy Policy, 39, 6505-6513.

SWP. (2015), A Hybrid Security Policy for Europe. Resilience, Deterrence, and Defence as Leitmotifs, SWP Comments 22, April 2015. Stiftung Wissenschaft und Politik/German Institute for International and Security Affairs.

Szabo, S.F. (2015), Germany, Russia, and The Rise of Geo-Economics. London: Bloomsbury.

Szulecki, K., Fischer, S., Gullberg, A.T., Sartor, O. (2016), Shaping the 'Energy Union': Between national positions and governance innovation in EU energy and climate policy. Climate Policy, 16(5), 548-567.

Turșie, C. (2015), Macro-regional strategies of European integration. What can the Danube Region learn from the Baltic Sea Region? Procedia – Social and Behavioral Sciences, 183, 1-10.

Van der Vleuten, E., Högselius, P. (2012), Resisting change? The transnational dynamics of european energy regimes. In: Verbong, G., Loorbach, D., editors. Governing the Energy Transition. Reality, Illusion or Necessity. New York: Routledge. p75-100.

Wigell, M., Vihma, A. (2016), Geopolitics versus geoeconomics: The case of Russia's geostrategy and its effects on the EU. International Affairs, 92, 605-627.

World Bank. (n.d.), Data. European Union. Available from: http://www.data.worldbank.org/region/EUU. [Last accessed on 2016 Jun 08].

World Economic Forum. (2015), The Geo-Economics of Energy. Panel Discussion, Davos-Klosters, Switzerland. Available from: https://www.weforum.org/events/world-economic-forum-annual-meeting-2015/sessions/geo-economics-energy/. [Last accessed on 2016 Jun 07].

Ydersbond, I.M. (2014), Aiming to be environmental leaders, but struggling to go forward: Sweden and Norway on energy system transformation. Energy Procedia, 58, 16-23.

ANNEX

Table 1: Annual energy production and consumption in the Baltic Sea region (2010-2012 average, in ktoe)

Country	Average consumption	Average production	Balance
DE	322,773.17	124,684.17	−198,089
DK	18,875.73	20,578.53	1702.8
EE	6149.33	5019.9	−1129.43
FI	35,892.37	17,173.87	−18,718.5
LI	6963.77	1306.27	−5657.5
LV	4514.33	2129.7	−2384.63
NO	30,346.63	199,960.77	169,614.13
PL	99,841.07	68,491.9	−31349.17
RU	772,254	1,374,802.8	602,548.8
SE	50,100.53	33,757.9	−16,342.63

Source: EUROSTAT online energy statistics, complete energy balances, table nrg_110a (2010-2012 average), EIA total primary energy production (2010-2012 average)

Table 2: Annual energy deficit/surplus in the Baltic Sea region (2010-2012 average, in ktoe)

Country	As a percentage of national consumption	As a percentage of regional deficit (−273670.87 ktoe)	As a percentage of regional surplus (773865.73 ktoe)
DE	−61.37	−72.38	
DK	+9.02		0.2
EE	−18.37	−0.41	
FI	−52.15	−6.84	
LI	−81.24	−2.07	
LV	−52.82	−0.87	
NO	+558.92		21.9
PL	−31.4	−11.45	
RU	+78.02		77.9
SE	−32.62	−5.97	

Source: EUROSTAT online energy statistics, complete energy balances, table nrg_110a (2010-2012 average), EIA total primary energy production (2010-2012 average)

Table 3: Exchange of energy in the Baltic Sea region (2010-2012 average, as a percentage of the regional deficit[16]

	DE	DK	EE	FI	LI	LV	NO	PL	RU	SE
DE	0	0.2	0	0	0	0	0	0.64	0	0.03
DK	0.6	0	0	0	0	0	0.07	0.01	0	1.6
EE	0	0	0	0.04	0	0.09	0	0	0	0
FI	0.02	0	0	0	0	0	0.004	0	0	0.08
LI	0.03	0	0	0	0	0.01	0	0	0	0
LV	0	0	0.03	0	0.09	0	0	0	0	0
NO	11.3	1.2	0	0.4	0	0	0	0.4	0	1.9
PL	0.08	0	0	0	0	0	0	0	0	0.009
RU	22.7	0.03	0.2	5.1	1.3	0	0.3	8	0	3.3
SE	0.06	0.2	0	0.2	0	0	1.9	0.05	0	0

Table 4: Exchange of energy in the Baltic Sea region (2010-2012 average, in ktoe)

	DE	DK	EE	FI	LI	LV	NO	PL	RU	SE
DE	0	539.7	0	0	0	0	0	1764.1	0	90.2
DK	1760.1	0	0	0	0	0	204.8	28.1	0	4421.4
EE	0	0	0	114.4	0	249	0	0	0	0
FI	68.1	0	0	0	0	0	10.7	0	0	218.4
LI	88.7	0	0	0	0	27.8	0	0	0	0
LV	0	0	89.53	0	258.4	0	0	0	0	0
NO	30943.6	3228.1	0	988.3	0	0	0	1114.9	0	5265.5
PL	222.6	0	0	0	0	0	0	0	0	25.8
RU	62056.0	84.1	537.0	14067.2	3542.2[17]	0	828.2	21846.2	0	8959.0
SE	173	489.5	0	611.7	0	0	521.8	141.8	0	0

Source: EUROSTAT online energy statistics (2010-2012), imports, table nrg_121a. Exporters: left column, importers: top line

16 −273670.87 ktoe.

17 According to Eurostat data, Lithuania imported 11661.9 ktoe of energy from Russia. As Lithuania has an average annual energy consumption of 6963.77 ktoe, this figure appears to contain energy transfers to Russia's Kaliningrad enclave. According to IEA data, Lithuania exported 8119.66 ktoe to Russia. It can hence be assumed that the net energy export from Russia to Lithuania amounts to 3542.24 ktoe.

Table 5: Exchange of energy in the Baltic Sea region (2010-2012 average, in % of national deficit of importing countries, Table 1)

	DE	DK	EE	FI	LI	LV	NO	PL	RU	SE
DE	0	N/A	0	0	0	0	N/A	5.63	N/A	0.55
DK	0.89	N/A	0	0	0	0	N/A	0.09	N/A	27.05
EE	0	N/A	0	0.61	0	10.44	N/A	0	N/A	0
FI	0.03	N/A	0	0	0	0	N/A	0	N/A	1.34
LI	0.04	N/A	0	0	0	1.17	N/A	0	N/A	0
LV	0	N/A	7.93	0	4.57	0	N/A	0	N/A	0
NO	15.6	N/A	0	5.28	0	0	N/A	3.56	N/A	32.22
PL	0.11	N/A	0	0	0	0	N/A	0	N/A	0.16
RU	31.33	N/A	47.55	75.15	62.61	0	N/A	69.69	N/A	54.82
SE	0.08	N/A	0	3.27	0	0	N/A	0.45	N/A	0

Source: EUROSTAT online energy statistics (2010-2012). Exporters: Left column, importers: Top line (as a percentage of national energy supply gap); the table shows energy exports [Table 3]/national energy balance [Table 1]