

TASK FORCE REPORT



Germany and the Baltic Sea Region:
Proposals for the New Federal Government

2018

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Glossary of Acronyms

- APT: Advanced Persistent Threats
- AMOPs: Aquatic Microbial Oxygenic Photoautotrophs
- bcm: billion cubic meters
- BEMIP: Baltic Energy Market Interconnection Plan
- Biofuel: the fermentation of crops such as corn and sugarcane that produces ethanol
- Biogas: the decomposition of garbage, human, and agriculture waste that produces methane
- Blockchain: A way of storing information in separate nodes called “blocks” that are each individually secured. The blocks are linked together, forming the “chain”, but maintain their individual protections making the system as a whole difficult to compromise or infiltrate.
- BSAP - Baltic Sea Action Plan
- BSR - Baltic Sea Region
- BUND-CERT: German Computer Emergency Response Team
- C2: Command and Control Systems
- C4I: Command, Control, Communications, Computers and Intelligence Systems
- CAB - Climate Awareness Bond
- CCDCoE: Cooperative Cyber Defence Centre of Excellence
- CDMA: Cyber Defence Management Authority
- CEE: Central and Eastern European Countries (Poland, Estonia, Latvia and Lithuania included)
- CEPA: Center for European Policy and Analysis
- CERT Polska: Polish Computer Emergency Response Team
- CERT: Computer Emergency Response Team
- CFE Treaty on Conventional armed forces in Europe
- CHP: Combined heat and power
- CIR: Cyber and Information Space Command of Germany
- CMX: Crisis Management Exercise
- CSBM Confidence and Security-Building Measures
- CSIRT: Computer Security Incident Response Team (interchangeable w/CERT)
- CSTO Collective security treaty organization
- CYBERSEC: European Cybersecurity Forum
- DDoS: Distributed- Denial-of-Service Attack
- EC: European Commission
- EDL-CU: Estonian Defense League-Cyber Unit
- EE-CERT: Estonian Computer Emergency Response Team
- EFD - European Defense Fund
- EFP Enhanced forward Presence
- EIB - European Investment Bank
- EJ: exajoule
- Estlink: Estonia Finland electricity interconnector
- EU-NIS: European Union Network Information Security
- EU: European Union
- FI-ISAC: Financial Institutes – Information Sharing and Analysis Centre
- FNC Framework nation concept
- GerPol: German Polish Power Link
- Gg - Gigagram (1,000,000kg)

- GHG - Greenhouse Gas
- GPIL: Gas Interconnection Poland Lithuania
- HELCOM - Helsinki Commission
- ICT: Information and Communication Technology
- IPCC - Intergovernmental Panel on Climate Change
- IPS/UPS: Integrated Power System/Unified Power System
- JCG Joint Consultative Group
- LitPol: Lithuania Poland electricity interconnector
- LNG: liquefied natural gas
- LULUCF - Land Use, Land Use Change, Forestry
- mcm: million cubic meters
- MIRT: Mobile Incident Response Teams
- MISIP: Malware Information Sharing Platform
- MN CD2: Smart Defence Multinational Cyber Defence Capability Development
- MoND: Ministry of National Defence
- Mtoe: the amount of energy released by burning one tonne of crude oil
- MW: MegaWatt
- NAF: Latvian National Armed Forces
- NATO North Atlantic Treaty Organization
- NATO: North Atlantic Treaty Organization
- NCIRC: Computer Incident Response Capability Technical Centre
- NCISS: NATO Communications and Information Systems School
- NICP: NATO Industry Cyber Partnership
- NordBalt: Sweden Lithuanian electricity interconnector
- NRF: NATO Response Forces
- NSA: Nuclear Safety Account
- OSCE Organization for Security and Cooperation in Europe
- OSCE: Organization for Security and Co-operation in Europe
- PCI: Projects of Common Interest
- PESCO Permanent structured cooperation
- QRF: Quick Reaction Force
- SACEUR: Supreme Allied Commander Europe
- tcm: trillion cubic meters of natural gas
- UNFCCC - United Nations Framework Convention on Climate Change
- VJTF: Very High Readiness Joint Task Force
- VNC: Voluntary National Contribution



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Executive Summary

The Baltic Sea Region (BSR), consisting of Germany, Poland, Lithuania, Latvia, Estonia, Russia, Finland, Sweden, and Denmark, has increasingly become a theater for confrontation between Russia and the West. As the largest Western state in the BSR and a member of both NATO and the European Union, Germany should take the lead in developing regional approaches that more effectively address Russian threats while signaling an abiding interest in cooperation with all the region's states.

Tensions in the BSR have increased recently due to illegal Russian incursions into Ukraine in 2014. More concerning, it remains clear that in lieu of traditional military tactics, Russian-backed organizations have adopted a methodology of combat that relies heavily on a combination of cyberattacks and the purposeful spread of disinformation, a process known as hybrid warfare, to destabilize the BSR and deter NATO objectives from being accomplished in the area. To address this issue, the new Federal Government should recognize that many of the concerns inherent in the BSR represent issues of critical interest to Germany, and should undertake a multi-faceted approach that addresses prevalent military, cybersecurity, and information threats without provoking Russian retaliation.

In addition to military concerns in the region, the long history of interconnection and economic codependence in the energy market has left the BSR greatly dependent on Russian natural gas and oil. In order to bolster cooperation and burden sharing among Baltic states, a greater emphasis should be placed on common infrastructure projects. The energy market in this region is inherently fragmented, and would benefit greatly from further projects that prioritize energy efficiency, diversity of supply, and renewable sources within the EU. Germany, as the largest energy consumer in the EU, and the largest state in the BSR, is in a good position to enhance interconnection and renewable energy supplies. Germany should work in tandem with its neighbors to better address shortages in energy supplies and further the integration of energy resources, in line with the EU's Energy Union initiative.

Lastly, though tensions have increased recently within the BSR, there is still room for cooperation among all states in the region on certain environmental and economic issues. Areas for economic cooperation in the region include the tourism and infrastructure sectors. Joint initiatives to promote eco-tourism and sustainable infrastructure have the possibility to increase economic performance, and international visibility in the region. The region is also facing many challenges associated with climate change, including rising sea levels, increases in extreme weather, and dangers to public health. Furthermore, poor sewage treatment practices, coupled with intensive agriculture is leading to the destruction of the Baltic Sea through eutrophication. All BSR states must share the equal burden of ecological damage to the region, and these common issues provide opportunities for collaboration between Germany and other Baltic Sea states.

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DEFENSE AND MILITARY SECURITY

Executive Summary

The Baltic Sea Region (BSR) has been the scene of increasingly aggressive posturing from Russia, which has led to reduced stability and security in the region. In engaging Russia, Germany should employ a dual-track policy whereby its alliances are strengthened, while simultaneously pursuing limited steps toward detente. Three major points will be addressed to solve this issue, all of which will be directed at maintaining a resilient, unified military alliance in the area, and creating a more stable regional environment.

To adequately address cohesion concerns throughout NATO, Germany should take on a greater role within the alliance in three ways. First, by working towards achieving the NATO-encouraged defense spending goal of 2% of GDP in a timely manner. Second, by redirecting current military resources towards the Baltic Republics, with a focus on bolstering defensive capabilities in the region. Third, to push forward the “Framework Nations Concept” by joining elements of the Estonian, Latvian, and Lithuanian armed forces with the Bundeswehr. This increased effort to strengthen NATO through German action serves as a deterrent to future Russian aggression.

Germany should be a proponent for further cooperation and integration on security issues within the BSR. Through assuming a more active role in Baltic security issues within the European Union (EU), Germany should encourage the European Defense Fund (EDF) to provide resources to the Baltic Republics for assistance on security projects. Germany should encourage a military Schengen zone spanning the BSR to facilitate greater Nordic-Baltic cooperation, while also advocating for the PESCO framework in order to create a greater capacity for forward defense forces in the BSR. Finland and Sweden’s increased cooperation with NATO should be taken into consideration when creating the military Schengen zone, as both countries are not NATO members but are very active in defense collaboration within the BSR.

To reinforce a robust security environment in the BSR, Germany should pursue a cooperative approach on security issues to supplement its deterrence strategies. It should promote a mutual strategy of control through a regional arms control treaty (Baltic Arms Limitation Treaty) and furthermore, should create alternatives to military confrontation through a new pattern of security relations within the BSR based on peaceful cooperation, information exchanges, and reassurance. Advocating for the objectives of establishing a secure and stable balance of conventional armed forces should be encouraged and pursuing the appropriate steps to eliminate vulnerabilities to surprise attacks and large-scale offensive action in the BSR must also be considered. This will create a situation conducive to restoring trust and will serve to increase cooperation between Russia and the states of the BSR. Germany and its NATO allies within BALT should continue to uphold the Minsk Accords and encourage dialogue with Russia. Combined with deterrence measures, this constitutes a comprehensive dual-track approach to Russian-Western relations.

NATO and the Baltic Sea Region

Russian Aggression During the Past Decade

- 2008 ~ Russia sends troops into Abkhazia and South Ossetia in Georgia, and conflict with Georgian forces occurs.¹ Russian forces continue to advance into sovereign Georgian land.
- 2014 ~ Russian-backed separatists invade eastern Ukraine and Crimea. Russia holds referendum in Crimea, which decides to join the Russian Federation. Western powers declare the referendum illegal.²
- 2017 ~ Russia conducts Zapad-17 military exercises on Russia and Belarus' borders with the BSR.³

Cohesion Problem

NATO states maintain different views on how to tackle the Russian threat, and there are differing perspectives on what NATO is supposed to accomplish in the international arena. After the Russian invasion of Crimea in 2014, the Baltic Republics' fear of Russian encroachment on neighboring states became a reality. Beginning in 2014, Lithuania and Latvia have increased their defense expenditure as a percent of GDP more than any other NATO state by a significant margin, and Estonia has boosted its spending above the 2% threshold to 2.14%.⁴ These changes in spending behavior amongst the Baltic Republics reflect their fear of Russian invasion. In states farther from the Russian border, such as Spain and Croatia, military spending remains consistently below the 2% threshold, and spending on military equipment remains far from the NATO-suggested 20% mark.⁵ Meanwhile, Germany's relationship with Russia can appear inconsistent, even hypocritical, to outsiders. While communicating solidarity with NATO and its goals, Germany simultaneously pursues actions contrary to those objectives. Nord Stream 2 is the most notable example of this behavior, as it is actively opposed by fellow NATO states in the region due to the prominent position of Gazprom in the project and a fear of becoming overly dependent on Russian provided resources. This brings into question Germany's willingness to employ effective sanctions against Russia for its aggressive actions abroad.

Vladimir Putin's Russia sees potential opportunities to drive a wedge between NATO's member states, as seen with Putin's probing of NATO's resolve during his 2014 invasion of Crimea and multiple major military exercises on the western Russian border. In order to maintain a secure and peaceful Europe, NATO seeks to reinforce its indivisibility. A more prominent and decisive German role within the alliance would contribute significantly to this end.

¹ "2008 Georgia Russia Conflict Fast Facts," *CNN Library*, accessed February 22, 2018. <https://www.cnn.com/2014/03/13/world/europe/2008-georgia-russia-conflict/index.html>

² "Ukraine Crisis: Timeline," BBC News, November 13, 2014, sec. Europe. <http://www.bbc.com/news/world-middle-east-26248275>.

³ Gordon, Michael R., and Eric Schmitt, "Russia's Military Drills Near NATO Border Raise Fears of Aggression," *The New York Times*, July 31, 2017, sec. Europe. <https://www.nytimes.com/2017/07/31/world/europe/russia-military-exercise-zapad-west.html>

⁴ NATO, "Defence Expenditure of NATO Countries (2010-2017)," NATO, PDF, last updated June 29, 2017, 3. https://www.nato.int/nato_static_fl2014/assets/pdf/pdf_2017_06/20170629_170629-pr2017-111-en.pdf

⁵ NATO, "Defence Expenditure of NATO Countries (2010-2017)," 2017, 5.

Increasing Germany's Role in Common Defense

The 2% Goal

German defense funding has been consistently below NATO's 2% of GDP benchmark, a shortfall which has been noted in the Ministry of Defense's White Paper.⁶ Under pressure from other NATO members, Germany has begun to shift its military policy towards more aggressive strategic preparation, a process which should be continued in the face of recent Russian aggressive posturing. Chancellor Merkel vowed in 2017 to increase Germany's defense spending to 2% of its GDP by 2024,⁷ a goal which may prove challenging given the current German military budget of 1.22% of their GDP.⁸ This is an increase of only .05% over the previous year. Additionally, it is difficult to increase the military budget of a state to a target percent of GDP when that state's economy is growing rapidly. As Germany's GDP has been growing at an average of 2.25% per year over the last five years, the military budget relative to its new GDP mark has typically shrunk to the point where between 2012 and 2016, the military budget as a percentage of GDP shrunk an average of 3.24% per year.⁹

A realistic goal for Germany would be to increase its military budget by an average of .075% of the GDP growth percentage each year. This relative change would represent an initial increase in military spending of around €3.05 billion every year, plus an additional amount each successive year as total GDP grows. A plan of this magnitude would place the German military budget at the 2% mark sometime around 2029. If a funding plan along these lines is implemented, it would represent a significant increase in military funding and would serve to bolster NATO defense forces while simultaneously increasing Germany's influence and clout in alliance negotiations. Five to eight years of consistently increased spending would send a strong signal that Germany is willing to put significant effort towards common European defense. By implementing a defense budget growth that is tied to the GDP growth percentage, any economic fluctuations that Germany experiences would be automatically corrected for. This gives the German government maximum flexibility in the event of an economic boom or bust, and should remove any spending disincentive from unexpected economic developments. An element of unpredictability in annual military budget is inherently inevitable in this type of plan due to fluctuating economic growth rates, but with the increased certainty of consistently higher military spending, the benefits outweigh the potential pitfalls.

Allocation of German Military Funding

The German newspaper *der Spiegel* reported in 2014 on the dilapidated state of the Bundeswehr, which maintains a single, marginally fit-for-service submarine, and seventy unfit-for-service armored combat vehicles.¹⁰ The Bundeswehr continues to have manpower, equipment and upkeep problems, indicating that Germany's nominal strength is weaker than it appears. Furthermore, foreign missions outside of the EU have cost upwards of €17 billion between 1992 and 2014, and Germany continues to spend militarily overseas in places like Mali and

⁶ "White Paper on German Security Policy and the Future of the Bundeswehr," The German Marshall Fund of the United States, September 19, 2016.

⁷ Sanders, Lewis, IV "How Does Germany Contribute to NATO?" DW.COM, accessed 26 January 2018. <http://www.dw.com/en/how-does-germany-contribute-to-nato/a-38033967>

⁸ NATO, "Defence Expenditure of NATO Countries (2010-2017)," 2017, 3.


⁹ "Military Expenditure (% of GDP) | Data" World Bank Group, accessed 28 January 2018.

<https://data.worldbank.org/indicator/MS.MIL.XPND.GD.ZS?end=2016&locations=DE&start=2012>

¹⁰ SPIEGEL Staff, "Germany's Disarmed Forces: Ramshackle Military at Odds with Global Aspirations," Spiegel Online, September 30, 2014, sec. International. <http://www.spiegel.de/international/germany/ramshackle-army-at-odds-with-berlin-s-global-aspirations-a-994607.html>

Afghanistan.¹¹ To align resources with its highest military and defense priorities, Germany should allocate money towards increasing Bundeswehr operational effectiveness and redirect some military resources from operations overseas to European defense.

Equipment problems in the German armed forces*

	Stock	Operational
 Eurofighter, fighter jet	114	38
 Tornado, fighter jet	93	29
 Transall, transport aircraft	50	21
 NH90, utility helicopter	40	5
 Tiger, attack helicopter	43	7
 Sea King, utility helicopter	21	3-5
 Sea Lynx, multipurpose helicopter	22	4

Source: Bundestag Armed Forces Commissioner, Annual Report 2016 | * selected examples © DW

Figure 1: Inoperability of military equipment in the Bundeswehr.¹²

The Parliamentary Commissioner for the Armed Forces’ 2016 Report presented a detailed examination of the personnel shortages in the Bundeswehr, expressing concern over an aging military that lacks sufficient manpower to support its multiple commitments (NATO and UN missions included). 3,300 servicemen and women in 2016 were “simultaneously on the 13 mandated deployments abroad,”¹³ highlighting both the need for more personnel and the inefficiency of the military bureaucracy. Domestically, support for the Bundeswehr remains controversial, a reaction to Germany’s overly militaristic past. The German social culture of “never again war,” and memory of being the aggressor in the last world war, makes recruitment difficult,¹⁴ and acts as a distinctive obstacle to expanding the Bundeswehr.

Germany should recognize that its military power is most effective in Europe, not around the world. Instead of dedicating funds to operations overseas, Germany should persuade NATO allies and EU partners that their efforts are best focused on the European continent by withdrawing a significant amount of troops from overseas missions (particularly in Afghanistan) to be deployed in NATO states. Convincing the US in particular of this plan is necessary, but its successful implementation is likely because it is also in the best interests of the US and the rest

¹¹ Böcking, David. “Bundeswehr: Das Kosten Die Deutschen Auslandseinsätze,” *Spiegel Online*, February 19, 2016.

<http://www.spiegel.de/wirtschaft/soziales/bundeswehr-auslandseinsaetze-kosten-mehr-als-17-milliarden-euro-a-1078118.html>.

¹² Deutsche Welle, “Ombudsman: German Army Is ‘short of Almost Everything’,” *DW.COM*, 26 January 2016, 6 February 2018.

<http://www.dw.com/en/ombudsman-german-army-is-short-of-almost-everything/a-19005841>.

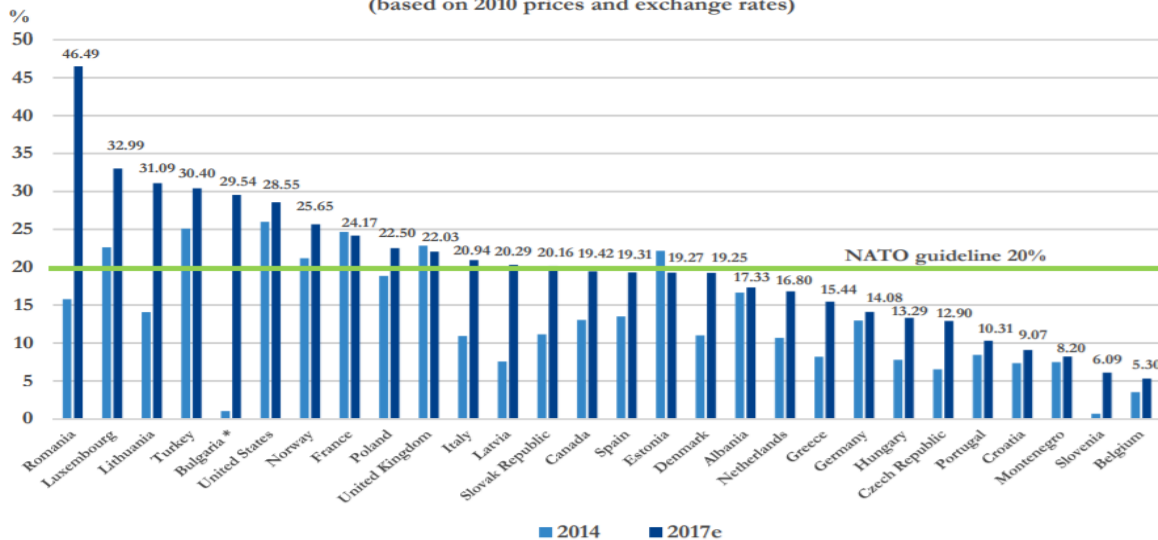
¹³ “Information from the Parliamentary Commissioner for the Armed Forces: Annual Report, 2016 (58th Report)” *German Bundestag*, 18th Electoral Term, PDF (24 January 2017), 7.

https://www.bundestag.de/blob/501800/c9afdf96dfc06a60f49c60c0ed7111d7/annual_report_2016_58th_report-data.pdf.

¹⁴ Kundnani, Hans. “Merkel and Whose Army?” *Foreign Policy Online*, December 13, 2016. <http://foreignpolicy.com/2016/12/13/merkel-and-whose-army-germany-military-nato/>.

of NATO. The US might be able to allocate fewer resources into European defense if such a plan is pursued, and Germany would be a stronger ally in leading the defense of the BSR. A strong Germany in Europe provides a stable backbone for European integration and concerning NATO cohesion: if Germany can be relied upon to be the first to defend NATO frontier states, those states are more likely to cooperate efficiently with NATO. With less money spent overseas, plus a higher military budget, Germany will have money to spend on building a formidable military. This money should be split three ways. The deficiencies in equipment operability should be addressed; Germany currently spends 14.1% of its military budget on equipment,¹⁵ well below the NATO-recommended 20%. Bringing that spending rate up to 20% would put Germany in the middle of the pack relative to other NATO states in terms of equipment spending, and go a long way towards increasing the operational effectiveness of the Bundeswehr.

Graph 4 : Equipment expenditure as a share of defence expenditure (%)
(based on 2010 prices and exchange rates)



Notes: Figures for 2017 are estimates.
* Defence expenditure does not include pensions.
** In December 2016, Turkey fundamentally changed the calculation methodology of GDP (to bring it in line with the European System of Accounts (ESA) 2010), resulting in significant increases from 2011. If one uses the previous methodology, then the corresponding percentages for 2014 and 2017 are 1.70% and 1.86%, respectively.

Figure 2: Change in military equipment spending in NATO, 2014 and 2017¹⁶

Furthermore, additional funding should be directed towards personnel recruitment across the board. The Parliamentary Commissioner for the Armed Forces 2016 Annual Report extols the effectiveness of “careers centres” (similar to an informational job fair for the Bundeswehr) in acquiring applicants,¹⁷ and it also recommends expanding advertising for the Bundeswehr. Finally, funds should be reprioritized to help build up infrastructure and cyber defense systems in the Baltic Republics. This would ensure effective and rapid movement of German and alliance forces in the region. It must be noted however, that such an augmentation of Germany’s military is not without its caveats, and both German and international resistance may be expected. Particularly within Germany, some on the left might strongly oppose the collectivization of Germany’s military while Poland’s government might view the act as unnecessarily aggressive

¹⁵ NATO, “Defence Expenditure of NATO Countries (2010-2017),” 2017, 3.

¹⁶ NATO, “Defence Expenditure of NATO Countries (2010-2017),” 2017, 3.

¹⁷ “Information from the Parliamentary Commissioner for the Armed Forces: Annual Report, 2016 (58th Report)” *German Bundestag*, 18th Electoral Term, 24 January 2017, 13.

and threatening. It is therefore important for Germany to approach the issue carefully, communicating

Enhanced Forward Presence and the Framework Nations Concept

At NATO's 2016 Warsaw Summit, member states agreed to the Enhanced Forward Presence (EFP) program wherein each of the Baltic Republics and Poland would host a multinational battlegroup on a rotational basis.¹⁸ The EFP provides an immediate on-the-ground NATO presence in border states, with leadership roles coming from mostly non-EU states such as the US and Canada, in addition to Germany and the UK. NATO states should continue to present the EFP as the public face of NATO's defensive action, while simultaneously pursuing parallel action under the "Framework Nations Concept" (FNC). Germany proposed the FNC in 2013, and NATO endorsed it at its 2014 Wales Summit,¹⁹ providing a precedent for implementation. Germany has declared its dedication in the long run to create "appropriate multinational capability development,"²⁰ a nod towards future military integration. It has already begun the process, with nineteen allies (the Baltic Republics included) agreeing to cluster around Germany as a "framework nation."²¹ Romania and Czechia have integrated a brigade each within the German military, and the Netherlands has integrated two brigades.²² A similar agreement between Germany and each of the three Baltic Republics should be implemented, although on a proportionally smaller scale, with Germany as the "Framework Nation," and the Baltic Republics specializing in particular fields, supplementing the German ranks. For example, based on precedent, Lithuania could provide navy troops for German ships in the style of Lithuania's current Maritime Protection Team in the EU operation ATALANTA off the Somali coast. This plan would directly link Germany with critical frontier NATO states, serving the dual purpose of reinforcing a forward defense with respect to Russia, and solidifying German willingness to act effectively on the rhetoric it puts forth to NATO.

Lithuania has already started taking steps in this direction, with a platoon serving with the German contingent in Mali since October 2017.²³ The next step should be to integrate one or two battalions from each Baltic Republic with the Bundeswehr, as the Baltic Republics have agreed to be "spoke nations" for a German "Framework Nation," and participate in NATO's EFP. Unified German-Baltic battalions would be permanent, and thus coalesce better as a cohesive group, creating a sense of permanence currently lacking in the EFP due to its rotational nature. While not promising complete integration, the FNC is a step in the direction of enhanced bilateral cooperation between Germany and its allies.

Individual bilateral agreements between Germany and each Baltic Republic (through the FNC), help prove to these states that Germany will provide needed support, despite overtures to Russia through BALT (discussed below) and regional perceptions of Nord Stream 2. The FNC would serve as a safety net for European military cooperation within NATO, as the US begins to show

¹⁸ NATO, "Boosting NATO's Presence in the East and Southeast," NATO, accessed 14 February 2018. http://www.nato.int/cps/en/natohq/topics_136388.htm.

¹⁹ NATO, "Wales Summit Declaration," NATO, 5 September 2014, accessed 26 January 2018. http://www.nato.int/cps/en/natohq/official_texts_112964.htm.

²⁰ "White Paper on German Security Policy and the Future of the Bundeswehr," The German Marshall Fund of the United States, September 19, 2016, 68.

²¹ Glatz, Rainier L. and Martin Zapfe. "NATO's Framework Nation Concept," CSS Analyses in Security Policy, No. 218, December 2017. <http://www.css.ethz.ch/content/dam/ethz/special-interest/gess/cis/center-for-securities-studies/pdfs/CSSAnalyse218-EN.pdf>.

²² Braw, Elisabeth. "Germany is Quietly Building an Army Under Its Command," *Foreign Policy Online*, 22 May 2017. <http://foreignpolicy.com/2017/05/22/germany-is-quietly-building-a-european-army-under-its-command/>

²³ "Another 34 Lithuanian Soldiers Start Service in Mali," *Ministry of Foreign Affairs of the Republic of Lithuania*, 19 October 2017. <https://www.urm.lt/default/en/news/another-34-lithuanian-soldiers-start-service-in-mali>

signs of ambivalence towards its allies. Maintaining the EFP as the face of NATO operations remains critical to NATO cohesion, though further action to cement intra-European cooperation is also needed. With the EFP serving as an example, the FNC can take the EFP a step further towards effective multinational militaries, while avoiding the international spotlight that the EFP attracts.

North Atlantic Treaty Article V

The Parties agree that an armed attack against one or more of them in Europe or North America shall be considered an attack against them all and consequently they agree that, if such an armed attack occurs, each of them, in exercise of the right of individual or collective self-defence recognised by Article 51 of the Charter of the United Nations, will assist the Party or Parties so attacked by taking forthwith, individually and in concert with the other Parties, such action as it deems necessary, including the use of armed force, to restore and maintain the security of the North Atlantic area.

Any such armed attack and all measures taken as a result thereof shall immediately be reported to the Security Council. Such measures shall be terminated when the Security Council has taken the measures necessary to restore and maintain international peace and security.²⁴

Russian Reaction

NATO has been a constant concern for the USSR, and later Russia, since its inception in 1949. Actions as suggested above are directly against the interests of Russia, and in the case of the FNC, potentially antagonistic. Transparency should be a priority in carrying out these actions, while a firm hand is simultaneously needed. Furthermore, NATO should not back down on military integration while Russia continues to occupy Crimea. Russia has previously used intimidation and pseudo-military actions to block former Soviet-sphere nations from cooperating with the West. While Russia is unlikely to consider actions similar to the 2008 invasion of Georgia against current EU or NATO states due to the likelihood of provoking a military response from the West, Russia could respond with an escalation of the hybrid warfare it currently employs against the West, including cyberattacks, disinformation campaigns, and election meddling. A possible avenue for successful Russian propaganda would be in swaying German public opinion more firmly against increased German military spending. Ramped up cyberattacks on states in the BSR, and efforts to influence elections in the BSR in favour of pro-Russian parties, will likely be attempted as a way to disrupt NATO and EU unity. The West should avoid taking actions which would cause a Russian response that would trigger NATO Article V. Triggering Article V would be against Russian interests as well, and the above proposals are not extensive enough to provoke drastic Russian countermeasures.

²⁴ NATO, "The North Atlantic Treaty," NATO. Accessed February 20, 2018. http://www.nato.int/cps/en/natohq/official_texts_17120.htm.

Baltic Security through the European Union

Permanent Structured Cooperation (PESCO)

The EU has been working towards defense integration since its inception, and over time the urgency to develop a concrete, collaborative defense framework has only grown. PESCO can significantly increase EU member states' ability to pool resources and funds to be more efficient in security efforts. Germany specifically has been pushing for the creation of a Defense and Security Union within the EU, which creates an opportunity for Germany to translate its vision for a Defense and Security Union into a tangible PESCO infrastructure.

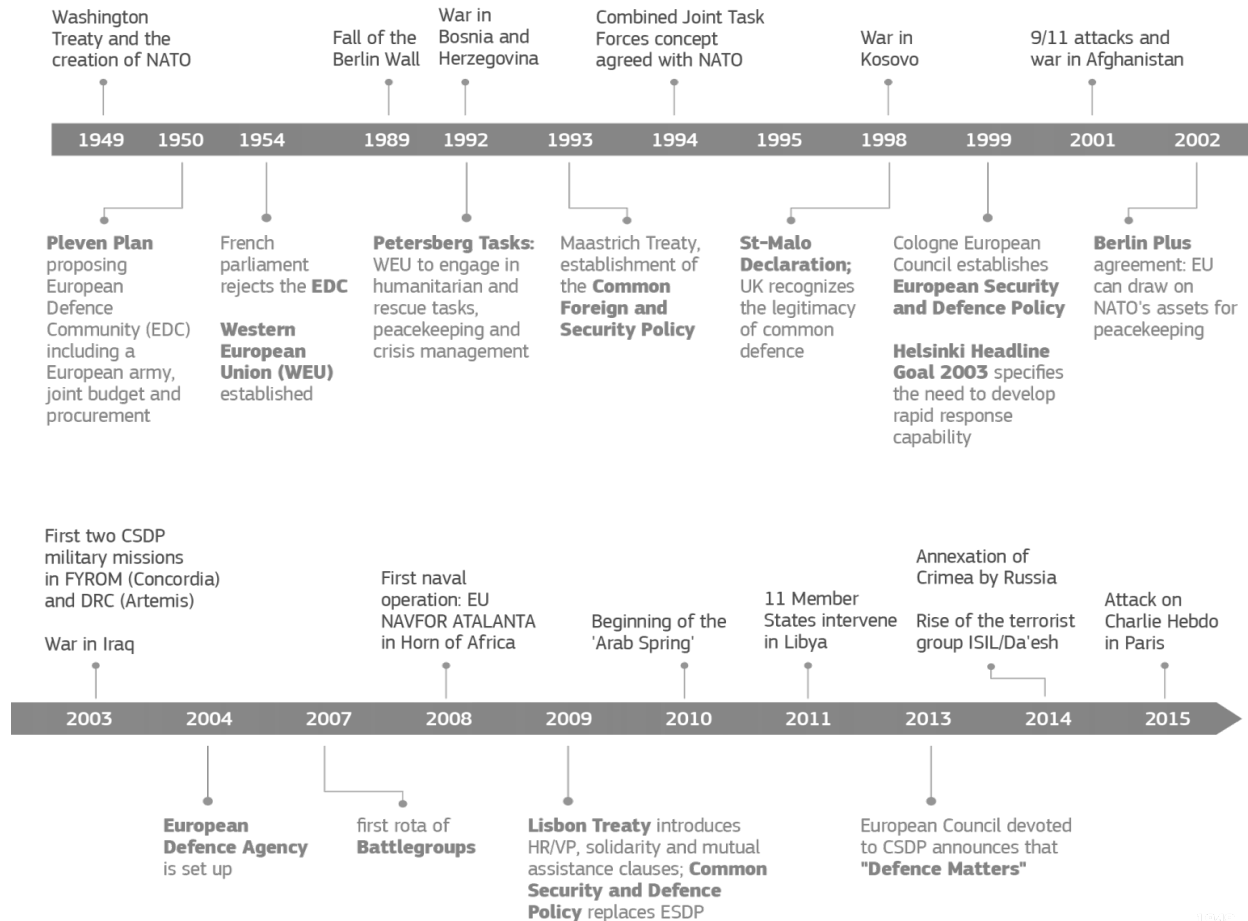


Figure 3: Shows the landmark treaties and policies created that have expanded and furthered the integration of EU defense and security policy since 1950.²⁵

With the establishment of PESCO, member states will be able to directly pool military resources between all those signed onto the program. The main goal of this initiative is to deepen defense cooperation among EU member states to create a greater capacity to respond to security concerns.²⁶ By December 2017, all member states had signed on, with the exception of Malta, Denmark, and the UK, indicating that the majority of member states see a clear benefit to being a

²⁵ "In Defence of Europe," *European Commission*, June 15, 2015, accessed 25 February 2018. https://ec.europa.eu/epsc/publications/strategic-notes/defence-europe_en

²⁶ "Permanent Structured Cooperation (PESCO) – Factsheet," *European Union External Action*, 16 November 2017, accessed 30 January 2018. [https://eeas.europa.eu/headquarters/headquarters-homepage_en/34226/Permanent Structured Cooperation \(PESCO\) - Factsheet](https://eeas.europa.eu/headquarters/headquarters-homepage_en/34226/Permanent%20Structured%20Cooperation%20(PESCO)%20-%20Factsheet).

part of this new structure.²⁷ There has been some controversy over how EU defense integration will interact with NATO, however PESCO is being created to complement NATO and signal



Infographic: Valentin Kreilinger, Jacques Delors Institut – Berlin, 13 November 2017.
 PESCO: EU Member States that signed the joint notification. It is possible for EU Member States to join at [TWITTER @TINEUROPE](#)

An illustration of how PESCO will overlap with NATO by EU politics expert Valentin Kreilinger

that Europe is prepared to take on more responsibility in security issues around the world.²⁸

Figure 4: This infographic shows the overlap between PESCO, NATO, and EU member states.²⁹

First Collaborative PESCO Projects

Since PESCO has been signed by a majority of EU member states, there have been around 21 proposed collaborative projects to which member states may contribute through this new framework.³⁰ Projects proposed by Baltic states include:

- European Medical Command
 - Proposed by Germany
- European Union Training Mission Competence Centre (EU TMCC)
 - Proposed by Germany
- Cyber Rapid Response Teams and Mutual Assistance in Cybersecurity
 - Proposed by Lithuania
- EUFOR Crisis Response Operation Core (EUFOR CROC)
 - Proposed by Germany

The main security concerns in the BSR include military mobility, cybersecurity, and defense of both air space and maritime space. Each of these concerns can potentially be addressed through previously proposed collaborative projects, however special consideration should be afforded to the BSR security environment when funding and completing these projects, due to its recent history of facing significant security threats from Russia.

²⁷ "Defence Cooperation: Council Establishes Permanent Structured Cooperation (PESCO), with 25 Member States Participating." Council of the European Union, Dec. 11, 2017, accessed 25 February 2018.

²⁸ "Stronger Together Thanks to PESCO." Federal Government of Germany, Nov. 13, 2017, accessed 31 January 2018. https://www.bundesregierung.de/Content/EN/Artikel/2017/11_en/2017-11-13-pesco_en.html.

²⁹ Kreilinger, Valentin, and Laura Wolfstader, "EPPO and PESCO: Flexibility in EU Integration," *Jacques-Delors Institut*, Nov. 13, 2017, accessed 1 February 2018. <http://www.delorsinstitut.de/en/all-publications/eppo-and-pesco-flexibility-in-eu-integration/>

³⁰ "Permanent Structured Cooperation (PESCO) first collaborative PESCO projects – Overview," Consilium. <http://www.consilium.europa.eu/media/32079/pesco-overview-of-first-collaborative-of-projects-for-press.pdf>

Germany's Opportunity with PESCO

The establishment of PESCO allows Germany the opportunity to influence the creation of infrastructure to enhance the security and defense cooperation amongst member states, the sharing of military resources, and the pooling of defense spending. Germany, through its FNC, has jump-started the process of pooling military forces into the Bundeswehr.³¹ Germany should mimic the FNC's structure when helping to design PESCO, though PESCO would expand beyond the integration of military units into the German military, and would encompass the pooling of various military resources, equipment, and conventional forces. Germany has been a leader in developing EU defense policy beyond its original ideation, and should lead PESCO as it evolves. The development of a strong framework for PESCO could lead to major improvements in defensive abilities, including increases in flexibility, communication and integration of member states' military innovations. Additionally, it will provide for a greater ability to pursue deterrence measures against Russian aggression and other future security issues.

The European Defense Fund

The EDF is a €5.5 billion fund created in June of 2017 with the goal of supporting security projects to boost Europe's defense capabilities.³² Similar to the goal of PESCO, the EDF seeks to improve coordination on defense spending to increase efficiency and reduce redundancies in spending by member states.³³ The fund includes two branches: research, and development and acquisition.³⁴ With €90 million allocated to research through 2019, and €500 million allocated every year beginning in 2020, the EDF is on track to become one of the largest defense research funds in Europe.³⁵ This, coupled with a development and acquisition fund of €500 million through 2019-2020, and €1 billion per year each year after, gives member states the opportunity to pursue defense research fully funded by the EU, in search of solutions to key security issues with the focus on improving military technology.³⁶ The development of improved technology is critical in efforts to counter Russian cyber, air, and maritime threats. The BSR can take advantage of this new fund and propose support for research projects that will assist this region in creating a more secure environment.

Germany as an Advocate for Baltic Security Interests

While Germany is not in direct control of the EDF, it should use its influence in the EU to prioritize security projects proposed by Baltic states that focus on researching technology that will improve security in the BSR. Supporting and influencing greater cooperation between Baltic states on security and defense issues should be a priority for all states in the region. This will improve and increase the number of strong security project proposals being submitted to the EDF. A more secure Baltic Sea Region is a more secure Germany.

³¹ Braw, Elisabeth. "Germany is Quietly Building an Army Under Its Command," *Foreign Policy Online*, 22 May 2017

³² European Commission, "Press Release - A European Defence Fund: €5.5 Billion per Year to Boost Europe's Defence Capabilities," June 7, 2017, accessed 25 February 2018. http://europa.eu/rapid/press-release_IP-17-1508_en.htm.

³³ European Commission, "Press Release - A European Defence Fund: €5.5 Billion per Year to Boost Europe's Defence Capabilities," June 7, 2017, accessed 25 February 2018.

³⁴ European Commission, "Press Release - A European Defence Fund: €5.5 Billion per Year to Boost Europe's Defence Capabilities," June 7, 2017, accessed 25 February 2018.

³⁵ European Commission, "Press Release - A European Defence Fund: €5.5 Billion per Year to Boost Europe's Defence Capabilities," June 7, 2017, accessed 25 February 2018.

³⁶ European Commission, "Press Release - A European Defence Fund: €5.5 Billion per Year to Boost Europe's Defence Capabilities," June 7, 2017, accessed 25 February 2018.

A Military Schengen Zone in the Nordic-Baltic Sea Region

Lithuania's Defense Minister, Raimondas Karoblis, proposed the creation of a "military Schengen project that would facilitate the movement of troops in Europe."³⁷ This perspective resonates with various other leaders in the Baltic Republics, NATO, and throughout Europe. The establishment of a military Schengen zone should begin in the BSR, incorporating: Germany, Poland, Latvia, Lithuania, Estonia, Finland, Sweden, Norway, and Denmark, but could later be expanded throughout the EU. Currently, transporting troops and military equipment across borders is a slow process that requires permits and meeting the controls of each border, which can sometimes take several weeks to get permission to move through.³⁸ In Germany specifically, every *Bundesland* has its own procedure for military transports.³⁹

"NATO has made substantial progress in surmounting legal hurdles to cross-border operations, lingering bureaucratic requirements - such as passport checks at some border crossings and infrastructure problems, like roads and bridges that can't accommodate large military vehicles - could slow or even cripple any allied response to an emerging threat."⁴⁰

One of the most threatening aspects of Russian aggression is their ability to move troops and military equipment very quickly, as evidenced through their Zapad exercises. Creating a Schengen-style military zone with the main goal of significantly increasing the mobility of military forces and equipment would increase the BSR's capacity for defense and would greatly decrease the area's reaction time in the event of a Russian confrontation. Legally this proposal should be modeled after the current Schengen zone, and could work together with the new PESCO framework in solidifying more cohesive EU defense measures. Furthermore, this proposal would be created through a new intergovernmental agreement among participating Baltic states, and should provide suggested criteria for the incorporation of additional states on a voluntary basis in the future. Criteria agreed upon in this proposed agreement should solidify uniform border procedures and infrastructure in order to ease the ability of transporting troops and military materiel throughout members of this zone.

Another benefit of creating this zone throughout the BSR is that the project could expand to include improving and standardizing mobility infrastructure, such as ports, airfields, bridges and roads that currently hinder the rapid movement of forces in the event of an emergency. Sharing of information on the infrastructure within each signatory of the military Schengen zone agreement, as well as the new ability to pool resources, would make the improvement and equalizing of infrastructure easier. As rapid deployment of forces is the goal, infrastructure projects would need to be a priority in order to make this goal more achievable in the region.

While the creation of a military Schengen zone throughout the BSR would increase mobility, NATO will remain the cornerstone of security in the region for defense planning and operations. The development of this zone should be made in consultation with NATO, to ensure that the criteria of the agreement matches NATO standards, especially since the material being

³⁷ "Lithuania Proposes Creation of 'Military Schengen'," *Press TV*, Sept. 9, 2017, accessed 25 January 2018. <http://www.presstv.com/Detail/2017/09/09/534534/Lithuania-proposal-military-Schengen>.

³⁸ Schultz, Teri. "NATO in Europe Needs 'military Schengen' to Rival Russian Mobility," *DW.COM*, Dec. 9, 2017, accessed 25 February 2018. Schwartz, Mathew J. "French Officials Detail 'Fancy Bear' Hack of TV5Monde," *Bank Information Security*, June 12, 2017, accessed 25 January 2015. <https://www.bankinfosecurity.com/french-officials-detail-fancy-bear-hack-tv5monde-a-9983>

³⁹ Schultz, Teri. "NATO in Europe Needs 'military Schengen' to Rival Russian Mobility," *DW.COM*, Dec. 9, 2017, accessed 25 February 2018.

⁴⁰ Herszenhorn, David M. "Call for 'Military Schengen' to Get Troops Moving," *POLITICO*, August 4, 2017. <https://www.politico.eu/article/call-for-military-border-schengen-to-get-troops-moving-nato-eu-defense-ministers/>.

transported across borders in this zone will include NATO equipment. All Baltic states are members of NATO except Finland and Sweden, which are ‘Enhanced Opportunity Partners’ and have contributed to multiple NATO operations. More recently, cooperation has increased further with the “exchanges of information on hybrid warfare, coordinating training exercises, and developing better joint situational awareness to address common threats and develop joint actions.”⁴¹ Furthermore, NATO is currently working on incorporating both states into the “enhanced NATO Response Force and regular consultations on security in the Baltic Sea region.”⁴²

Critics of the creation of this zone in Europe argue that it may threaten and incite more aggression from Russia, however this can be avoided if the project emphasizes transparency and highlights efforts as purely defensive endeavors aimed at improving EU and NATO cooperation and defensive capabilities.

Baltic Regional Security: Finding Innovative Ways to Address Arms Control

The Current Status of Arms Control in the Baltic Region

An Increased Military Presence in the Baltic Sea Region

Following Russia’s illegal annexation of Crimea in March 2014 and its military actions in Ukraine, there has been a significant increase in military activity across the Euro-Atlantic area, and close encounters between Russian and NATO member state’s armed forces have become worryingly frequent.⁴³ One such area of increased military activity is the BSR.^{44, 45} The other Baltic states have responded to Russian posturing by conducting military exercises with other NATO members and partners, such as the Dragon-17 exercise in Poland,⁴⁶ and by increasing military preparedness and spending within the region.⁴⁷ The demonstration of Russia's increased aggression has worried both NATO members and the European Union, both of which are forcing transatlantic policy-makers to reassess collective defense arrangements across the BSR in what is frequently referred to as NATO’s “eastern flank.”⁴⁸ The BSR sans Russia has shown an increased commitment to coordinating deterrence measures with NATO strategy, even within the non-NATO member states Sweden and Finland.⁴⁹ Despite enhanced deterrence strategies, however, the BSR still suffers from an increasingly fragile security environment. The BSR’s lack of mutual reassurance and transparency structures has proven problematic to any productive dialogue with Russia in enhancing the overall security of the region.

⁴¹ NATO, “Relations with Sweden,” *NATO*, Mar. 30, 2017, accessed 25 February 2018. https://www.nato.int/cps/ic/natohq/topics_52535.htm.

⁴² NATO, “Relations with Sweden,” *NATO*, Mar. 30, 2017, accessed 25 February 2018.

⁴³ Frear, Thomas, Łukasz Kulesa and Ian Kearns, “Dangerous Brinkmanship: Close Military Encounters between Russia and the West in 2014,” London, UK: *European Leadership Network*, 2014.

<http://www.europeanleadershipnetwork.org/medialibrary/2014/11/09/6375e3da/Dangerous%20Brinkmanship.pdf>.

⁴⁴ Sharkov, Damien. “Russia’s Paratroopers Are Practicing Military Drills near NATO’s Baltic Border,” *Newsweek*, July 5, 2017.

<http://www.newsweek.com/russian-forces-drop-nato-border-632178>.

⁴⁵ Gordon, Michael R., and Eric Schmitt, “Russia’s Military Drills Near NATO Border Raise Fears of Aggression,” *The New York Times*, July 31, 2017, sec. Europe.

⁴⁶ The Dragon-17 exercise conducted in Poland included NATO allies Poland, Lithuania, Latvia, Germany, Britain, Slovakia, Italy, Bulgaria, Romania, as well as partner nations Georgia and Ukraine. The ‘defensive’ exercise was in response to the Zapad exercise conducted by Russia and Belarus.

⁴⁷ “Baltics, Fearing Russia, to Triple Military Spending by 2018: Report” *Reuters*, October 19, 2016, accessed 20 February 2018.

<https://www.reuters.com/article/us-baltics-military/baltics-fearing-russia-to-triple-military-spending-by-2018-report-idUSKCN12J2S4>.

⁴⁸ McNamara, Eoin Micheál, “Securing the Nordic-Baltic region.” *NATO Review*, accessed 25 January 2018.

<http://www.nato.int/docu/review/2016/Also-in-2016/security-baltic-defense-nato/EN/index.htm>.

⁴⁹ See formation of the Readiness Action Plan (RAP) in NATO. NATO. “Wales Summit Declaration Issued by the Heads of State and Government Participating in the Meeting of the North Atlantic Council in Wales.” NATO. Accessed February 20, 2018.

http://www.nato.int/cps/en/natohq/official_texts_112964.htm.

Russians Exercise More Than NATO Members

Number of service personnel taking part in military exercises by Russia and NATO

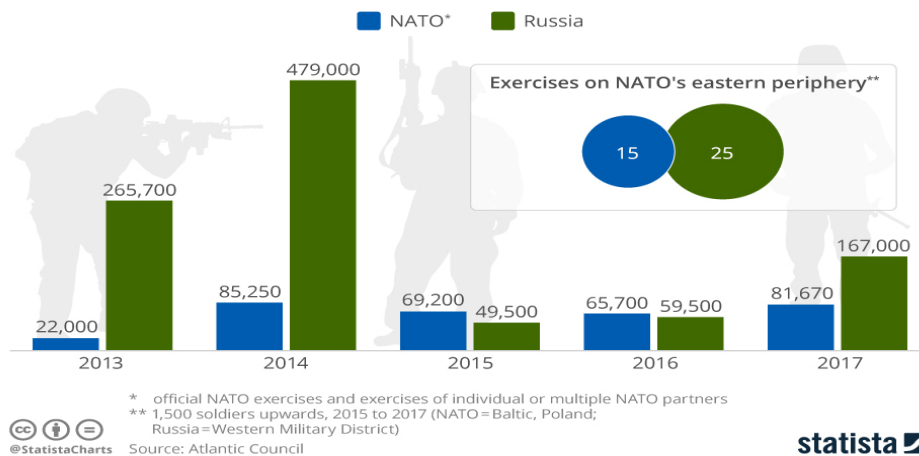


Figure 5: Increased Russian military exercises between 2013-2017.⁵⁰

A Failure of Arms Control in the Baltic Sea Region

The erosion of arms control agreements in Europe has had distinctly negative effects in the BSR. Past agreements such as The Conventional Armed Forces in Europe Treaty (CFE), signed in 1990, “outlined provisions aimed at establishing a military balance between,” NATO and the Warsaw Pact “at a lower level of armaments”⁵¹ and “was designed to prevent either alliance from amassing forces for a blitzkrieg-type offensive.”⁵² Additionally, the CFE provided important measures of predictability, conventional arms transparency, and international confidence-building measures. Updated in 1999, the Adapted CFE Treaty was modernized to fit the new security structure of the post Cold War era and set in place comprehensive national conventional arms control ceilings along with an inspection regime that provided an unprecedented degree of transparency on military holdings. This Adapted CFE, however, has hit a significant roadblock, as the United States and its NATO partners in CFE have refused to ratify it “until Russia first complies with its new weapons limits and with the commitments Moscow made in the CFE Final Act and the Organization for Security and Cooperation in Europe (OSCE) Istanbul Summit Declaration.”⁵³

On July 14, 2007, Russian President Vladimir Putin signed a federal decree “on suspending the Russian Federation’s participation in the Treaty on Conventional Armed Forces and Related International Agreements.”⁵⁴ The Russian government outlined “six circumstances that affect the security of the Russian Federation” to explain its suspension decision, including:

⁵⁰ Loesche, Dyfed “Infographic: Russians Exercise More Than NATO Members.” Statista Infographics, accessed 25 January 2018. <https://www.statista.com/chart/11088/number-of-soldiers-taking-part-in-military-exercises-by-russia-and-nato/>.

⁵¹ “Treaty on Conventional Armed Forces in Europe (CFE),” U.S. Department of State, accessed 16 January 2018. <https://www.state.gov/t/avc/cca/cfe/>.

⁵² Kimball, Daryll and Kingston Reif, “The Conventional Armed Forces in Europe (CFE) Treaty and the Adapted CFE Treaty at a Glance,” Arms Control Association, accessed 18 January 2018. <https://www.armscontrol.org/factsheet/cfe>.

⁵³ Kimball, Daryll and Reif, Kingston. “The Conventional Armed Forces in Europe (CFE) Treaty and the Adapted CFE Treaty at a Glance.” Arms Control Association, Accessed January 18, 2018.

⁵⁴ “On Suspending the Russian Federation’s Participation in the Treaty on Conventional Armed Forces in Europe and Related International Agreements,” Kremlin, Russian Federation, accessed 15 January 2018. <http://en.kremlin.ru/supplement/3327>.

- “The excessive parties to the CFE Treaty that belong to NATO, and the exclusive group that formed among CFE Treaty members as a result of the widening of the alliance;”
- “Estonia, Latvia and Lithuania’s failure to participate in the CFE Treaty has adverse effects on Russia’s ability to implement its political commitments to military containment in the northwestern part of the Russian Federation. Estonia, Latvia and Lithuania’s actions result in a territory in which there are no restrictions on the deployment of conventional forces, including other countries’ forces.”⁵⁵

In keeping with its suspended participation in the Joint Consultative Group (JCG), Russia has not participated in the CFE Treaty Review Conferences since March 2015. Additionally, both the U.S. and Russia have accused each other of violating sections of the CFE in multiple annual compliance reports.⁵⁶ The Ministry of Foreign Affairs of the Russian Federation has also stated that “it is pointless to return to the issue of committing to the long-standing and hopelessly obsolete CFE Treaty.”⁵⁷ As a result, the practice of mutual reassurance through information exchanges and transparency measures established in the CFE and 2011 Vienna Document has effectively broken down. This has contributed to an increased risk of unintended escalation within the BSR. Barriers to regulating transparency and predictability relating to military exercises during the Zapad military exercise are examples of the negative consequences of the CFE breakdown.⁵⁸ Furthermore, a recent policy brief published by the European Leadership Network reported that since 2014 there has been a visible increase in the “intensity and gravity of incidents involving Russian and Western militaries and security agencies” due to a lack of military-to-military dialogue, with the majority of the documented incidents taking place in the BSR.⁵⁹ Accordingly, the de facto collapse of CFE has left it unable to execute its set goals of conventional armed forces limitations, transparency, and international confidence-building within and beyond the BSR during a time of increased tensions between Russia and the West.

⁵⁵ Kremlin. "On Suspending the Russian Federation's Participation in the Treaty on Conventional Armed Forces in Europe and Related International Agreements," Accessed January 15, 2018.

⁵⁶ See Ministry of Foreign Affairs of the Russian Federation. “Comment by the MFA of Russia on the U.S. Department of State’s Annual Report on Adherence to and Compliance with Arms Control, Nonproliferation, and Disarmament Agreements and Commitments.” Accessed January 15, 2018. http://www.mid.ru/foreign_policy/news/-/asset_publisher/cKNonkJE02Bw/%20content/id/2740264 And “Compliance with the Treaty on Conventional Armed Forces in Europe Condition (5) (C) Report,” *U.S. Department of State*, accessed 15 January 2018. <http://www.state.gov/t/avc/rls/rpt/2017/270369.htm>.

⁵⁷ Ministry of Foreign Affairs of the Russian Federation, “Comment by the MFA of Russia on the U.S. Department of State’s Annual Report on Adherence to and Compliance with Arms Control, Nonproliferation, and Disarmament Agreements and Commitments,” accessed 15 January 2018. http://www.mid.ru/foreign_policy/news/-/asset_publisher/cKNonkJE02Bw/%20content/id/2740264.

⁵⁸ Boffey, Daniel. “Nato Accuses Russia of Blocking Observation of Massive War Game,” *The Guardian*, September 6, 2017. <http://www.theguardian.com/world/2017/sep/06/nato-russia-belarus-zapad>.

⁵⁹ Frear, Thomas, Kulesa, Łukasz and Kearns, Ian. *Dangerous Brinkmanship: Close Military Encounters between Russia and the West in 2014*.

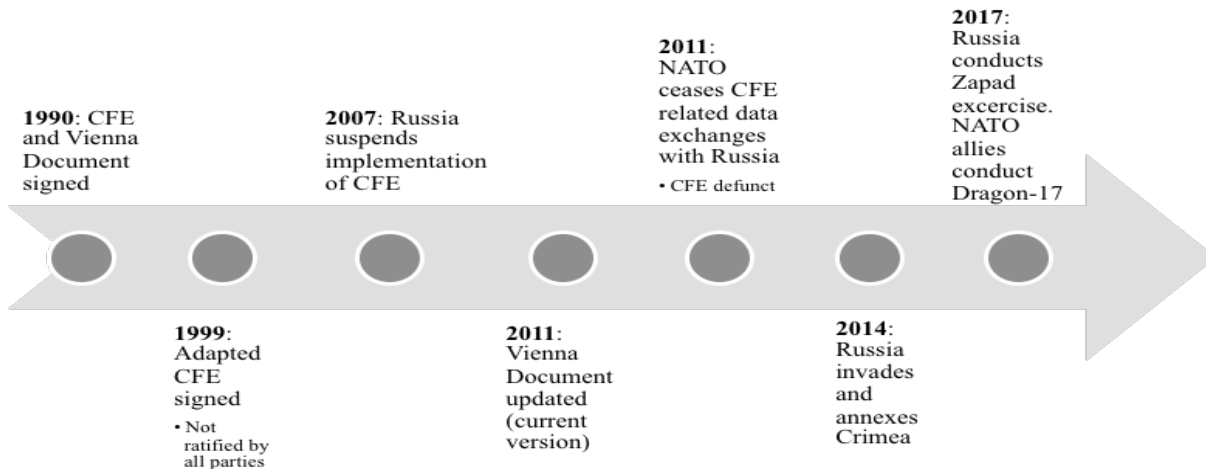


Figure 6: Timeline of significant arms control agreements and evidence of their breakdown.

An Innovative Way to Address Arms Control Issues in the Baltic Sea Region

Arms control has historically been extremely important to German strategy in maintaining a resilient security environment.⁶⁰ A number of critical arms control treaties, such as the CFE, have failed to adapt to the changing security environment of the post Cold War era. Additionally, Russia has refused to follow through with its commitments to the CFE, due to stipulations of the ratification of the Adapted CFE being tied to Russian involvement in Ukraine, Moldova and Georgia.⁶¹ Consequently, continued pursuit of Russian support for the CFE in the foreseeable future, will continue to fail. To restore the important role of arms control, and catapult it into the twenty-first century while also addressing the immediate issue of Baltic regional insecurity, Germany should commit itself to finding innovative and multilateral solutions in promoting new arms control treaties. Additionally, Germany should take this opportunity to communicate its commitment to upholding the Minsk Accords.

Baltic Arms Limitation Treaty (BALT)

Germany should initiate the formation of a multilateral arms limitations agreement among regional powers in order to reinforce a safe and robust security environment in the BSR. The Baltic Arms Limitation Treaty (BALT) will prioritize information exchanges and increase understanding of the disposition of conventional forces within the BSR, aiming to create transparency systems that enhance a more secure regional environment. This will produce a situation conducive to cooperation between Russia and the Baltic Sea states. Based on the strategy of a ‘dual track’ policy, this treaty is designed in hopes of taking steps toward a more cooperative approach to security issues.⁶²

BALT seeks to ensure its effectiveness in accomplishing the following:

- Promotion a mutual strategy of control to ensure regional stability

⁶⁰Major, Claudia and Christian Mölling, “How Germany Should Change Its Approach to Arms Control,” Carnegie Europe, September 7, 2017, accessed 6 February 2018. <http://carnegieeurope.eu/strategieurope/73031>.

⁶¹ Kimball, Daryll and Reif, Kingston. “The Conventional Armed Forces in Europe (CFE) Treaty and the Adapted CFE Treaty at a Glance.”

⁶² NATO, “The Future Tasks of the Alliance: Report of the Council (“The Harmel Report”),” NATO, accessed 6 February 2018. http://www.nato.int/cps/en/natohq/official_texts_26700.htm.

- Creation of alternatives to military confrontation, through a new pattern of security relations among the BALT parties based on peaceful cooperation, information exchanges, and reassurance
- Elimination of the capability for launching surprise attacks and for initiating large-scale offensive action in the BSR
- Communication of commitments to the objective of establishing a secure and stable balance of conventional armed forces

Regional Framework for Arms Control

Traditional arms control treaties have historically encompassed large swaths of territory, often locking parties into endless negotiations. BALT is unique in that it introduces a regional framework to addressing arms control issues, specifically those pertaining to the BSR. BALT would include the following parties: Belarus, Estonia, Denmark, Finland, Germany, Latvia, Lithuania, Norway, Poland, Russia, and Sweden. By creating a regional framework, BALT addresses a number of issues identified in trying to update the CFE, including Russia's concern that it is dominated by an expanding number of NATO members. By taking on a more regional focus, BALT will include a more favorable ratio of NATO (Germany, Estonia, Denmark, Norway, Latvia, Lithuania, Poland) to non NATO members (Belarus, Finland, Russia, and Sweden), of which two are Collective Security Treaty Organization members (CSTO) (Belarus and Russia). Additionally, BALT can focus its attention on maintaining the participation of its parties, particularly the Baltic Republics, which are currently not part of the CFE, yet are at the forefront of German and NATO concerns about the security of the 'Eastern Flank'. The adoption of a regional framework will succeed in achieving hard-sought Russian participation, as it directly addresses and remedies some of the core issues Russia has expressed about the CFE and Adapted CFE Treaty. Furthermore, BALT provides Germany a flexible way of engaging with Russia through a non-NATO centered treaty, while still actively cooperating with NATO members and the organization itself. There will likely be some reluctance on the part of NATO members towards a regional arms control agreement, however, NATO members within BALT will be expected to continue to uphold NATO standards and obligations and work as a cohesive unit within the regional framework of BALT.

Creation of a Comprehensive Inspection Regime under BALT

BALT will be modeled on the CFE's values and benefits. As such, BALT's core function aims to restore military confidence within the BSR by focusing on increasing military transparency. Special attention should be paid to eliminating the capability to conduct "snap" exercises, improving risk-reduction measures to avoid military incidents or accidents, and preventing potential escalation and counter-escalation. To achieve this, BALT aims to encapsulate arms limitation on a national level while also incorporating reporting and transparency measures. BALT will contain detailed verification provisions, including information exchange on treaty-limited equipment and on-site inspections of its parties. Its provisions include:

- Annual exchanges of military information about forces located in the BSR
- Notifications for risk reduction including consultation about unusual military activities and hazardous incidents
- Prior notification of certain military exercises conducted in the BSR
- Observation of military exercises

- Exchange of annual military calendars
- Compliance and verification measures

The parties will exchange annual data on force structure (disposition) and equipment holdings, and provide notifications of changes in organization and equipment holdings above certain thresholds. These exchanges will be established through the creation of a Joint Consultative Group between BALT parties as a forum for discussion of treaty implementation matters.

Running parallel to BALT's comprehensive inspection regime and system for observing exercises, the OSCE will provide an inclusive arena in which to discuss hazardous military incidents specific to the BSR and resume dialogue on military transparency between Baltic Sea states and Russia. The Vienna Document in particular will provide a valuable framework for BALT in supporting military transparency and predictability through the incorporation of complementary, mutually reinforcing arms control agreements, along with its Confidence and Security-Building Measures (CSBMs). Additionally, pre-existing channels of communication established by the Vienna Document, such as the Communications Network -- made for reliable and secure means of transferring military information -- would be utilized to compliment BALT's transparency measures. As an additional verification measure to BALT's inspection regime, the incorporation of CSTO and NATO as observer organizations will underline reassurance measures in BALT, in addition to increasing military-to-military dialogue between the two organizations within the BSR. The improved communication between BALT signatories could lead to further cooperative measures in regards to the the Minsk Accords. NATO members can also be reassured that it will maintain a significant role in monitoring military exercises and will be at the center of information exchanges. NATO members within BALT will carry out pre-existing NATO transparency reassurances and work within the alliance network to encourage reciprocal reassurances by Russia and CSTO.

Conclusion

The security concerns of the BSR should be a top priority for Germany and it should seek greater cooperation amongst Baltic Sea states on security projects and measures to improve the stability of the region. A plan should be developed that increases German military spending, while simultaneously making more efficient use of current funds, and developing closer military bonds with NATO partners in order to effectively promote German involvement. With regards to NATO, Germany should tie a military spending goal to its GDP growth in order to reach the 2% goal in an efficient manner, refocusing its military spending on the BSR in order to maximize resources. Additionally, Germany should promote military cohesion and support for frontier NATO states through the FNC. Germany has a unique opportunity to influence the rapidly changing security environment through inspiring the PESCO framework to mirror its vision for a European Defense and Security Union. Pushing for the establishment of a military Schengen zone through the Nordic-Baltic region, and advocating for Baltic security concerns to the European Defense Fund to assist in funding joint Baltic security projects, should be a priority. More emphasis should also be placed on improving the consultation between Baltic states in defining Baltic security concerns. The BALT proposal provides an innovative arms control strategy for Germany and its allies to pursue a balanced approach towards Russia. The benefit of this approach is that it provides Germany a flexible way to engage Russia in arms control talks, as well as providing an opportunity for Germany to work more closely with its NATO allies in

the region in restoring the important role of arms control in the BSR. Collectively, these proposals form an effective framework for Germany to achieve greater security in the Baltic Sea Region.

Recommendations

1. Cohesion in NATO Through German Leadership

- *Implement a military spending goal tied directly to GDP growth, with the aim of growing the military budget consistently.*
- *Reallocate military spending towards regional defense, specifically on NATO's border.*
- *Continue implementing the Framework Nations Concept between the Baltic states and Germany, by starting to integrate Baltic military units with the Bundeswehr.*

2. Increased EU Military Integration

- *Take on an increased leadership role in the development of infrastructure for PESCO*
- *Lead the creation of a military Schengen zone through the Nordic-Baltic Sea region*
- *Prioritize Baltic security concerns through intensifying consultation around defining common areas of security interest in the Baltic Sea region to cooperate on and dedicate funds to from the European Defense Fund*

3. Find Innovative Ways to Address Arms Control Issues

- *Introduce regional arms control agreements centered on transparency and confidence building measures (BALT)*
- *Pursue detente with Russia in tandem with deterrence measures by NATO*
- *Create a resilient Baltic security environment through effective structural mechanisms within BALT*

CYBERSECURITY

Introduction

The Baltic Republics have become the frontline of potential conflicts between Russia and the West, and the constant cyberattacks against the Baltic Republics have raised concerns about Russia's intentions in the international arena. Though Russia deployed Quick Reaction Forces (QRF) at its Estonian border in 2017, the Kremlin understands that a direct physical confrontation between Russia and any of the Baltic Republics could result in the invocation of Article V of the North Atlantic Treaty and the direct intervention of NATO military forces, an event that would have catastrophic consequences.⁶³ As such, Russia has employed other measures to confront the West outside of conventional warfare tactics, with cyber weapons becoming their favored means. The Center for European Policy and Analysis (CEPA) concluded that "in cyberspace, Russia is the source of the greatest threat to Estonia, the European Union and NATO."⁶⁴ There is trend of increase in cyberattacks against critical infrastructure in Europe, a notable example of which is the 2007 attack on Estonia, that compromised the Estonian parliament, banks and its media outlets. In order to deter potential cyber threats from Russia and other hostile actors, attention should be given to Russia's cyber warfare capabilities and potential weaknesses of cyber defense in the BSR.

Background Information

The Russian government does not use the term "cyber warfare" when discussing its aggressive tactics in the BSR and the West at large, but instead uses the term "informatization", described as a "holistic concept that includes computer network operations, electronic warfare, psychological operations, and information operations."⁶⁵ The Russian military regards modern warfare as "the [...] implementation of measures of information warfare in order to achieve political objectives without the utilization of military force."⁶⁶ This unique understanding of cyber warfare lends insight into why Russia considers the use of cyber weapons to be an important area to invest in.

The Russian military is considered a "relative latecomer"⁶⁷ to cyber warfare compared to other Russian organizations like the FSB, realizing the power of hybrid warfare after the invasion of Georgia in 2008. The conflict, though a victory for Russia, revealed significant deficiencies in areas like intelligence gathering. Consequently, Russia's Ministry of Defense announced the establishment of a new military branch for "conducting information operations, complete with specially trained and equipped troops."⁶⁸ This new division "information troops" includes experts from various areas including hackers, linguists, journalists and psychologists that enhance Russia's capabilities to conduct broader, more sophisticated cyberattacks.

⁶³ Maxey, Levi. "The Baltics: Veterans of Russian Cyber Operations," The Cipher Brief, 6 Nov. 2017. www.thecipherbrief.com/the-baltics-veterans-of-russian-cyber-operations.

⁶⁴ Meltre, Patrik. "The Russian Cyber Threat: Views from Estonia," Center for European Policy Analysis, 18 May 2016, accessed 15 January 2018. <http://cepa.org/The-Russian-Cyber-Threat-Views-from-Estonia>

⁶⁵ Keir, Giles. "Russia's 'New' Tools for Confronting the West: Continuity and Innovation in Moscow's Exercise of Power," Chatham House, accessed 30 January 2018. <https://www.chathamhouse.org/publication/russias-new-tools-confronting-west>

⁶⁶ Military Doctrine of the Russian Federation, approved by Russian Federation presidential edict on February 5, 2010 (translated). Accessed at http://carnegieendowment.org/files/2010russia_military_doctrine.pdf

⁶⁷ Connell, Michael, and Sarah Vogler. *Russia's Approach to Cyber Warfare*. Report no. AD1019062. September 1, 2016.

⁶⁸ Connell, Michael, and Sarah Vogler. *Russia's Approach to Cyber Warfare*. Report no. AD1019062. September 1, 2016.

With the advancement of cyber technologies, aided by ample government funding, Russia now possesses multiple cyber weapons that have potentially global reach. One of the most commonly used attacks is the Distributed Denial-of-Service Attack (DDoS), when there is an attempt from various sources to make a machine or online service unavailable to valid users for an indeterminate period of time. The aggressors will flood the target machine or network with requests, leading to an overload of the system that causes it to crash, shutting down critical infrastructure systems including those that keep the transportation, energy and communication sectors running. The consequences of a DDoS attack can be seen in the 2007 Estonian cyberattacks, and the 2014 Ukrainian presidential election attacks which crippled the electoral commission's computer network.

Russia frequently uses malware attacks to gain access to sensitive intelligence. The initiation of malware attacks can lead to the extraction of highly sensitive intelligence and enables attackers to control targets' systems while simultaneously allowing attackers to change or even delete sensitive information. High-value personnel with access to sensitive information, by simply clicking malicious email attachments or links or using untrusted mobile devices, can initiate the malicious software in a well-designed attack known as spear-phishing. Additionally, there are also hacking groups sponsored by the Russian government that conduct cyberattacks using Advanced Persistent Threats (APT), a type of highly covert cyberattack, to break into a network, avoid detection, and harvest valuable information over a long period of time. Multiple well-known APT groups can be linked to Russia including APT28 (Fancy Bear) and APT29 (Cozy Bear). These groups specifically target European governments, militaries and NATO with almost daily cyberattacks. Besides state-sponsored hacking programs, the Russian government also recruits civilian hackers in order to avoid detection, and obscure the Kremlin's involvement.

Cyberattacks are not limited to state apparatuses and institutions alone. In the past decade, state-sponsored cyberattacks have demonstrated their potential to wreak havoc on civilian populations by disrupting critical infrastructure. The BSR boasts some of the most robust cyber defense systems in the world, yet high levels of vulnerability persist. In 2014 alone, Germany's cyber defenses for critical infrastructure, including power stations, water treatment plants, and oil refineries, faced over 600,000 distinct attacks and intrusions from both foreign state-sponsored and independent criminal elements.⁶⁹ That same year, a German steel mill "catastrophically failed" after a cyberattack compromised the facilities' control systems and caused the blast furnaces to uncontrollably overheat and ultimately fail. This incident illustrated that online attacks can indeed cause physical damage, and are capable of quickly derailing industrial production.

Information and communication infrastructures are equally vulnerable. For example,⁷⁰ in 2017, Latvian cell phones and emergency dispatch services were rendered inoperable for nearly an entire day as a result of Russian interference.⁷¹ Taken individually, these incidents are cause for

⁶⁹ Federal Republic of Germany, Federal Office for Information Security (BSI), *The State of IT Security in Germany 2015*, July 2015, accessed 31 January 2018. https://www.bsi.bund.de/SharedDocs/Downloads/EN/BSI/Publications/Securitysituation/IT-Security-Situation-in-Germany-2015.pdf?__blob=publicationFile&v=2

⁷⁰ Schwartz, Mathew J. "French Officials Detail 'Fancy Bear' Hack of TV5Monde." Bank Information Security. June 12, 2017. Accessed January 31, 2018. <https://www.bankinfosecurity.com/french-officials-detail-fancy-bear-hack-tv5monde-a-9983>

⁷¹ Birnbaum, Michael. "Latvia's Cellphones Stopped Working. Russia's War Games May Be to Blame," Washington Post, October 5, 2017, sec. Europe. Accessed January 31, 2018. https://www.washingtonpost.com/world/europe/latvias-cellphones-stopped-working-russias-war-games-may-be-to-blame/2017/10/05/449162d4-a9d3-11e7-9a98-07140d2eed02_story.html?utm_term=.9ad1adf0fcdc

alarm, but viewed together they constitute a potential crisis. Russian cyber warfare strategies are only one part of a larger hybrid warfare doctrine and many view the frequent cyberattacks in the BSR as mere trial runs for larger-scale hybrid warfare strategies.⁷² Therefore, the threat the region faces is not limited to isolated cyberattacks, but also includes coordinated cyberattacks that target multiple sectors of critical infrastructure and industry simultaneously. The chaos unleashed by such an attack would be catastrophic. In a matter of hours a nation could go “dark” as their power grid fails and communication networks cease to function.. A state facing this type of debilitating attack would be rendered entirely unproductive, and extremely vulnerable to military incursions, further cyber infiltration, and information theft. Despite steps taken to improve the region’s cybersecurity, the BSR is still wholly underprepared to prevent and respond to a coordinated, state-sponsored cyber assault. National and regional cybersecurity apparatuses must improve to face this reality.

Threats

Threat of the Human Factor

Cyberattacks against the human factor refer to the social-engineering processes, such as spear-phishing, that take advantage of human negligence to extract sensitive intelligence from people with access to important information. These attacks are one of the most imminent threats currently facing military personnel.⁷³ Russia has the capacity to conduct surveillance on NATO service members, which allows them access to information regarding military deployments, troops locations, military communication infrastructures, etc. According to a study by the U.S. Army Asymmetric Warfare Group, there have been “a number of cyberattacks and other electronic assaults on NATO forces stationed in the Baltic Republics as well as Poland.”⁷⁴ These attacks attempted to locate smartphones of military personnel with the goal of revealing the geographic locations and capacities of deployed NATO troops. Russian hackers attempted to remotely upload files to soldiers’ phones and install hostile software in order to make threats against soldiers’ families and loved ones in another attempt to exploit “the human factor” as well,. These kinds of attacks can influence troops’ morale and have a particularly negative psychological impact on young soldiers who are away from home. More concerning is the fact that many of these attacks were conducted by implanting malware on ordinary soldiers’ personal devices. Once the device is infected, the virus can easily spread within military network and reach high value electronic devices, which allow sensitive military information to be transmitted to the attackers. There are several known incidents in which NATO service members in Latvia and Estonia were approached by suspected Russian agents who implanted malware into their personal devices without raising suspicion. The exploitation of human negligence creates a severe threat to military assets in the Baltic region and beyond. Thus, additional education and training regarding counter-espionage should be implemented.

⁷² Standish, Reid. "Russia's Neighbors Respond to Putin's 'Hybrid War'," *Foreign Policy*, October 13, 2017, accessed 18 February 2018. <http://foreignpolicy.com/2017/10/12/russias-neighbors-respond-to-putins-hybrid-warlatvia-estonia-lithuania-finland/>

⁷³ Grove, Thomas, Julian E. Barnes, and Drew Hinshaw. “Russia Targets NATO Soldier Smartphones, Western Officials Say,” *The Wall Street Journal*, October 4, 2017, accessed 31 January 2018. <https://www.wsj.com/articles/russia-targets-soldier-smartphones-western-officials-say-1507109402>

⁷⁴ Grove, Thomas, Julian E. Barnes, and Drew Hinshaw. "Russia Targets NATO Soldier Smartphones, Western Officials Say." *The Wall Street Journal*. October 04, 2017. Accessed January 31, 2018 <https://www.wsj.com/articles/russia-targets-soldier-smartphones-western-officials-say-1507109402>

Threat of Hybrid Warfare

The same strategies used to target civilian infrastructure can simultaneously be used against military facilities, potentially creating large gaps in a state's military defenses and laying the groundwork for future physical attacks. This hybrid strategy was utilized to great effect during the 2008 Russo-Georgian War. On August 8th, while Russian military forces began mobilizing in the Georgian territory of South Ossetia, large DDoS attacks were initiated that cut off government communication networks and downed government websites. Georgian banks, transportation companies, and private telecommunications providers were also attacked, and had their services disrupted.⁷⁵ This is the first known example of a wide-scale offensive cyber operation that was coordinated with modern military offensive action. In the aftermath of this conflict, the Russian military seems to have decided to prioritize informational warfare strategies, by investing heavily in strengthening its cyber offensive capabilities. The Russian government spends an estimated "\$200 million to \$250 million per year" on developing further cyber warfare technologies.⁷⁶ A large part of this investment is applied to "the development and delivery of malicious programs which have the ability to destroy the command and control systems (C2) of enemy armed forces."⁷⁷ This further spending on offensive measures demonstrates the Kremlin's intent to continue strengthening and utilizing cyber weapons against foreign nations. To better meet these imminent threats, the BSR must forge deeper cooperation between the private sector and the military, as well as between Baltic governments and international organizations.

Threat Against the Military C2/C4I system

With the dramatic development in communication and information technologies in the past 20 years, effective exploitation of these technologies emerged as a critical factor in military affairs.⁷⁸ The advancement of these technologies contributes directly to the formation of the "nerve system" of the military: the command, control, communications, computers and intelligence (C4I) systems. Under this newly developed mechanism, the command and control (C2) is supported by various information technology sections: communications, computers and intelligence. The introduction of this mechanism integrates military resources and provides information superiority and greater situational awareness to military commanders for better decision making, putting the military in a favorable position in any potential conflicts. However, with continued military reliance on the C2/C4I systems and the participation of civilian actors in the system building process, there are increased risks of vulnerabilities to cyberattacks. As a command system, the C4I needs to connect multiple actors in order to function efficiently; this includes the command centers, frontline troops, supporting units, foreign allies and defense contractors. The interconnections between these actors create excellent opportunities for adversaries to infiltrate the whole system by exploiting the weak points in the connection chain.

⁷⁵Connell, Michael, and Sarah Vogler. *Russia's Approach to Cyber Warfare*. Report no. AD1019062. September 1, 2016. Accessed January 30, 2018.

⁷⁶ "Russia to spend \$250m strengthening cyber-offensive capabilities," SC Media UK, February 04, 2016, accessed 31 January 2018. <https://www.scmagazineuk.com/russia-to-spend-250m-strengthening-cyber-offensive-capabilities/article/531418/>

⁷⁷ "Russia to spend \$250m strengthening cyber-offensive capabilities." SC Media UK. February 04, 2016. Accessed January 31, 2018.

⁷⁸ National Research Council. Committee to Review DOD C4I Plans Programs, *Realizing the Potential of C4I : Fundamental Challenges*, Washington, D.C.: National Academy Press, 1999.

The Current State of Regional Military Cybersecurity

NATO

The 2007 cyberattacks against Estonia made NATO leaders realize the implications of cyber warfare, and forced them to consider cyber defense as a core mission for collective defense. Various developments in cybersecurity were achieved after the 2007 attack, including the establishment of the Computer Incident Response Capability Technical Centre (NCIRC) to provide 24/7 technical support for cyber threats. Furthermore, cyber exercises were held in Estonia including the NATO Crisis Management Exercise (CMX). In addition to these advances, NATO has begun incorporating cybersecurity concerns into Article V. NATO Secretary General Jens Stoltenberg announced in February of 2018 that NATO members have agreed “that a cyberattack can trigger Article V” and that they, “are in the process of establishing cyber as a military domain.”⁷⁹ The inclusion of cyber warfare as a military domain increases NATO’s deterrence capacities against potential cyberattacks, and has laid the groundwork for setting standards within NATO cyber defense. Besides progress on common understandings of cybersecurity, multiple institutions and projects were launched to enhance NATO’s cyber defense network. These projects include:

Institution / Project	Objectives
Computer Incident Response Capability Technical Centre (NCIRC)	Monitors NATO websites; Provides 24/7 technical support for cyberthreats
Cyber Defense Management Authority (CDMA)	Centralizes, manages, and coordinates cyberdefense operational capabilities
Cooperative Cyber Defense Centre of Excellence (CCDCoE)	Develops long-term NATO cyber defense doctrine and strategy
Smart Defense Multinational Cyber Defense Capability Development (MN CD2)	Facilitates the development of national cyber defense capabilities through collaborative efforts
Malware Information Sharing Platform (MISP)	Allows sharing of technical characteristics of malware within a trusted community
NATO Industry Cyber Partnership (NICP)	Facilitates access by Allies to a network of trusted industry/enterprises

NATO’s efforts toward advancing cybersecurity also include the publication of the Cyber Defense Pledge that urges member states to meet NATO cyberdefense standards. Secretary Stoltenberg also announced NATO’s plan to establish a new cyber command center for better integration of NATO cyber defense networks.⁸⁰ NATO also extends aid to non-member states, like Ukraine, to cope with cyberattacks. This can serve as a model to help non-NATO members like Finland and Sweden in the BSR access NATO cyber defense resources and prevent Russian

⁷⁹ NATO, “Press conference by NATO Secretary General Jens Stoltenberg ahead of the meeting of NATO Defence Ministers,” NATO, June 28, 2017, accessed 13 February 2018. https://www.nato.int/cps/ic/natohq/opinions_145415.htm

⁸⁰O’Neil, Patrick. “NATO will establish new cyber command centers,” Cyberscoop, November 10, 2017, accessed 13 February 2018. <https://www.cyberscoop.com/nato-cyber-command-centers/>

cyber warfare against their institutions. Though efforts have been made by NATO to address cybersecurity issues, vulnerabilities still exist.

Potential Vulnerabilities

Though a consensus was reached amongst NATO members that cyberattacks can trigger Article V with the purpose of increasing deterrence capabilities, the current cyber defense strategy has vulnerabilities that cannot be neglected. Deterrence theory only works when one party establishes its credibility and willingness to use offensive measures to initiate counterattacks if the other party exhibits aggressive behavior. Under current NATO cyberdefense scenarios, the BSR nations have reiterated their position as promoting “active defense”, and the lack of offensive countermeasures in this system jeopardizes their credibility based on willingness to retaliate, hence lowering the possibility of deterring cyberattacks. Another key factor for successful deterrence strategy is being able to identify the perpetrator behind the attacks.⁸¹ Retribution processes in cybersecurity are difficult and costly. Individual hacktivists (Hack Activist) such as non-state sponsored hackers would not be intimidated by potential retaliation since they can readily conceal their identity. Even if a state is sponsoring hacking groups to conduct attacks, difficulties arise when attempting to prove the connection between a state and potentially associated hackers, which can be a time-consuming and resource intensive process. Article V’s application in cyber defense is currently vague. Distinct clarification for the standard situation in which Article V will be triggered needs to be addressed. Cyberattacks occur daily, but most only cause small-scale disturbances rather than significant damage. Therefore, the severity of cyberattacks should be categorized, the most significant of which should be equated with physical attacks that prompt the invocation of Article V.

⁸¹ Dunn Cavelti, Myriam, “Cyber-Allies: Strengths and Weaknesses of NATO’s Cyber Defense Posture,” February 1, 2012, *IP Global Edition*, Vol. 12/3, pp. 11-158, 2011.

Overview of Regional Military Cybersecurity Baltic Sea Region Overview:

	Strengths	Weaknesses
Estonia	<p>Strong cyber capabilities to support NATO cyber operations and training: Publication of Tallinn Manual, CyCon annual conference and Lock Shield cyber exercise;</p> <p>Active involvement of private sector: multiple Estonian startups and enterprises join the cyber defense industry, such as BHC Laboratory, Clarified Security, Bytelife, GuardTime and Cybernetica.⁸²</p>	<p>Lack of incentive for information sharing internally and proper sharing procedures: lack of crisis communication plan;⁸³</p> <p>Transition process from civilian crisis to military crisis is vague, civilian cyber exercises can ignore the role of the military in supporting their defense;</p> <p>The Estonian intelligence agencies are worried about sharing sensitive information with the private sector, as well as with international partners.</p>
Latvia	<p>Canada deployed “cyber warriors” as NATO forces to Latvia to defend its information from attacks and fake news and prepare for massive Russian military exercise;⁸⁴</p> <p>Launched Cyber Defense Unit across various sectors to provide support for CERT.LV and NAF units in preventing ICT security incidents and management of consequences in crisis situations in cyberspace. enhance cybersecurity.⁸⁵</p>	<p>Defense budget is mostly devoted towards conventional arms,⁸⁶ only spends 0.94 % of GDP on defense;⁸⁷</p> <p>Cyber defense infrastructure is not capable of quickly and effectively responding to a serious cyberattack;</p>
Lithuania	<p>National Cybersecurity Centre was built to protect government organizations from cyberattacks;</p> <p>Actively engaged in activities with OSCE and other organizations; contributes and enhances its own security;⁸⁸</p> <p>MoND built cooperative relationship with institutions in Latvia and Estonia for information exchange and consultation.</p>	<p>Lack of a centralized cybersecurity system to coordinate cybersecurity measures (a CSIRT), put online financial transactions of Lithuania under threat ;⁸⁹</p> <p>Defense budget is mostly devoted towards conventional arms.</p>

⁸² E-Estonia Centre, "How Estonia became a global heavyweight in cybersecurity," *E-Estonia*, June 2017, accessed 15 February 2018. <https://e-estonia.com/how-estonia-became-a-global-heavyweight-in-cyber-security/>

⁸³ Pernik, Piret and Emmet Tuohy. "Interagency Cooperation on Cybersecurity: The Estonian Model," NATO, Report, accessed 15 February 2018.

⁸⁴ Blackwell, Tom. "Russian fake-news campaign against Canadian troops in Latvia includes propaganda about litter, luxury apartments," *Edmonton Journal*, November 20, 2017, accessed 19 February 2018. <http://nationalpost.com/news/canada/russian-fake-news-campaign-against-canadian-troops-in-latvia-includes-propaganda-about-litter-luxury-apartments>

⁸⁵ Ģelzis, Ģederts. "Latvia launches Cyber Defence Unit to beef up online security Science In-depth reporting on science and technology DW 04.03.2014," *DW.COM*, March 4, 2014, accessed 15 February 2018. <http://www.dw.com/en/latvia-launches-cyber-defence-unit-to-beef-up-online-security/a-17471936>

⁸⁶ Maldre, Patrik. "Global Connections, Regional Implications: An Overview of the Baltic Cyber Threat Landscape," International Centre for Defense and Security, October 2015, accessed 15 February 2018. https://www.icds.ee/fileadmin/media/icds.ee/failid/Patrik_Maldre_-_Global_Connections_Regional_Implications.pdf

⁸⁷ NATO, "Defence Expenditure of NATO Countries 2009-2016," NATO, March 2017. http://www.nato.int/nato_static_fl2014/assets/pdf/pdf_2017_03/20170313_170313-pr2017-045.pdf

⁸⁸ Adamowski, Jaroslaw. "Lithuania launches National Cyber-Security Centre as Eastern Europe ramps up cyber-defences," *SC Media UK*, September 26, 2016, accessed 15 February 2018. <https://www.scmagazineuk.com/cyber-attacks-growing-lithuanian-defence-minister-juozas-olekas/article/530695/>

⁸⁹ "Lack of centralized cybersecurity system makes banks vulnerable." *the independent*, March 29, 2016, accessed 20 February 2018. <http://www.theindependentbd.com/home/printnews/37780>

Germany	<p>Formally adopted cybersecurity as one of its integral parts of national defense;</p> <p>Cyber and Information Space Command (CIR);</p> <p>Integration of Military-Civilian experts: CIR have around 13,500 personnel from both military and civilian sectors; Joint research projects with academia and private sectors, such as "Cyber Cluster" and "Cyber Innovation Hub"⁹⁰</p>	<p>Lacks the ability to conduct large scale counterattacks;</p> <p>The usage of offensive cyber measures need the special approval from the parliament. Operations that requires secrecy to succeed may be influenced by parliamentary control;</p> <p>Lacks central leadership: CIR operations need to cooperate with intelligence agencies like BND or BfV, which are under the leadership of the German Chancellery and Interior Ministry respectively.⁹¹</p>
Finland	<p>Legislative reform provides Armed Force's NCSU with robust offensive capability within the cyber warfare countermeasures.</p>	<p>Previous leaks of classified information cast doubt on its competence⁹²</p> <p>Not a NATO member, will not benefit from the Alliance's security guarantee, in this scenario, Article V.</p>
Poland	<p>2 billion zlotys (60 million USD) is being allocated to form cyber-military which consist of 1000 troops to strengthen the cyber capabilities;⁹³</p> <p>The security interests were in line with NATO, and is expanding its activity in NATO⁹⁴</p>	<p>Polish political support for pro-European movements in Ukraine made the state a target for Russian interference and attacks.</p> <p>Emerging industrial sectors heavily reliant upon largely unsecured online technologies</p>
Sweden	<p>Boosting cyber defense funds, increasing expenditure to SEK 500 million (roughly 60 million USD) after years of cutbacks;</p> <p>Robust collaboration on cyber and intelligence-sharing capabilities with the US.⁹⁵</p>	<p>Weak cyber military defense considering its geographic position, the makeup of the neighbouring region and the structure of the economy and population,⁹⁶</p> <p>Not a NATO member, will not benefit from Alliance's security guarantee.</p>

⁹⁰ Deutsche Welle, "German army launches new cyber command" *DW.COM*, 4 January 2017, 15 February 2018. <http://www.dw.com/en/german-army-launches-new-cyber-command/a-38246517>

⁹¹ Skierka, Isabel. "Bundeswehr: Cybersecurity, the German way," ORF, accessed 15 February 2018. <http://www.orfonline.org/expert-speaks/bundeswehr-cyber-security-the-german-way/>

⁹² Huovinen, Anna. "Is Finland a forerunner in cybersecurity competence?" *VTT Blog – VTT*, December 8, 2015, accessed 15 February 2018. <https://vttblog.com/2015/12/08/is-finland-a-forerunner-in-cybersecurity-competence/>

⁹³ Lelonek, Adam. "Macierewicz: Poland to Have 1000 Cyber-Troops within the Structure of Its Military," *Defence24.com*, October 9, 2017, accessed 14 February 2014. <http://www.defence24.com/macierewicz-poland-to-have-1000-cyber-troops-within-the-structure-of-its-military>

⁹⁴ "Paweł Soloch: Poland's Security Priorities," *Defense News*, December 5, 2016, accessed 15 February 2018. <https://www.defensenews.com/outlook/2016/12/05/pawel-soloch-polands-security-priorities/>

⁹⁵ Nilsson, Carl. "The Baltic Region's Security Gap: Understanding Why U.S.-Swedish Military Cooperation Is Key." *Center for Strategic and International Studies*. June 7, 2016. Accessed February 15, 2018. <https://www.csis.org/analysis/baltic-region's-security-gap-understanding-why-us-swedish-military-cooperation-key>

⁹⁶ Rothschild, Nathalie. "What kind of conflict is Sweden preparing for?" *Euronews*, September 04, 2017, accessed 15 February 2018. <http://www.euronews.com/2017/09/04/what-kind-of-conflict-is-sweden-preparing-for>

Recommendations for Enhancing Regional Military Cybersecurity

Clarifying Cybersecurity Status under NATO Article V

Though cyber defense is now officially considered by NATO to be in the military domain, there is still a lack of clarity on what conditions would invoke an Article V response. Cyberattacks, unlike physical confrontations, occur frequently with varying degrees of effectiveness. NATO needs to clarify its understanding of what it considers to be a severe threat that mandates organized, Alliance sponsored, retaliation. The current framework already lists one type of cyberattack that can be considered for Article V retaliation, when , the attack has similar impacts to a physical military assault, such as causing human casualties. Greater clarification of the response to different severe attacks should be made under this model. For example, the response to cyberattacks against critical targets such as power grids and other vital infrastructure should be clarified and standardized. The clarification of prerequisites for triggering Article V enables each member state to assess their threats more properly and respond accordingly, which would prevent overreaction and erroneous retaliations from member states.

Coordinating Offensive Cyber Capabilities for Deterrence Purposes

States within the BSR and NATO often do not have offensive cyber capabilities due to public opposition, the limitations of laws and regulations, and a lack of capacity to develop such capabilities. However, nations like the United States possess the ability to conduct cyber counterattacks. A coordination mechanism should be established to allow Supreme Allied Commander Europe (SACEUR) to better integrate resources amongst member states for defensive and offensive purposes, and provide technical support for states with no offensive measures to respond to cyberattacks. The newly developed offensive cyber measures can be restricted to serve primarily as a retaliatory deterrent rather than as an offensive tool against other nations. Finland and Sweden, the non-NATO states in BSR, should be welcomed in the aforementioned coordination plan as well. Once the integrated countermeasures are established, the whole BSR's credibility concerning its willingness to retaliate under an "Article V" scenario will contribute directly to the formation of a strong deterrence network against Russia, conceivably causing Russia to become more hesitant when considering the use of cyber weapons.

Enhancing NATO/BSR Cyber Defense Awareness through Education and Training

Education and proper training regarding cybersecurity should be implemented for all military personnel in order to reduce the vulnerability to espionage. Military personnel should receive training about the methods Russia typically uses to implant spying software or other malware on their personal devices, so they can respond accordingly if the situation arises. Furthermore, all personnel with high security clearances or access to sensitive information need to receive more rigorous training aimed at detecting hostile social-engineering processes that aim to lure targets into revealing confidential information. Specific training should include sensitive communication handling and proper usage of memory storage devices. Besides education and training initiatives, personal and untrusted devices should be strictly regulated within military facilities and among those employed in combat forces. NATO education and training institutions, like the NATO Communications and Information Systems School (NCISS) and the Cooperative Cyber Defense Centre of Excellence (CCDCoE) should consult with experts in different industries and compile a guidebook in multiple regional languages to instruct troops about handling sensitive information.

Strengthening NATO/BSR Cyber Defense through Resource Integration

In order to develop more adept cybersecurity capabilities, additional resources will be required for states to develop new technology, and to properly educate, train, and recruit cyber specialists, all of which require additional funding. Each NATO member state, especially those within the BSR, needs to continuously move forward to achieve its goal of spending approximately 2% of gross domestic product on defense. Funding should be provided to strengthen NATO's Computer Incident Response Capability Technical Centre (NCIRC) in facilitating member states to foster resilience capacity for potential attacks, and to establish both a NATO Response Force (NRF) and a Very High Readiness Joint Task Force (VJTF) in cyber domains.

The Cooperative Cyber Defence Centre of Excellence (CCDCoE) in Estonia also needs more funding to lead NATO's cyber policy making activities when responding to potential attacks. Germany should support this institution through Voluntary National Contributions (VNC) of personnel and encourage others to do the same.⁹⁷ Besides more funding to support cyber operations, a greater push for enhancing cooperation with the private sector should be pursued. The BSR should consider expanding its current financial institutions, Information Sharing and Analysis Centre (FI-ISAC), to include the protection of military assets and increase cooperation between military cybersecurity experts and Computer Emergency Response Teams (CERTs) in other sectors. Civilian computer experts typically possess a great amount of experience in coping with emergency incidents and attacks and thus their experience and possible contribution to protecting the military should not be ignored.

Beyond technical support, larger information sharing platforms should be established by expanding the current Malware Information Sharing Platform (MISP) to include the private sector. Furthermore, civilian experts in other industries, such as in academia, energy, communication, transportation and social welfare, that are well versed on challenges pertaining to cybersecurity in their fields, should form an advisory board that provides insights on potential weaknesses in cybersecurity in their own realms.

Current State of BSR Civilian Cybersecurity

Germany

While the framework exists for a robust cybersecurity system in Germany and exhibits numerous opportunities for improvement, cybersecurity in Germany needs to be overhauled because the nation currently lacks the ability to effectively respond to large-scale cyberattacks.

Best Practices: Effective and Standardized Critical Infrastructure Protections

The Federal Office for Information Security (BSI) is the agency primarily responsible for maintaining the nation's cybersecurity measures. In addition to advising the federal government and citizenry on cybersecurity strategies and evaluating cyber threats, the BSI has recently expanded its competencies. In 2015 the IT Security Act was enacted by the legislature to create uniform standards of cybersecurity across the critical infrastructure and essential services sector (the law gives this label to energy, telecommunications, health, finance, traffic).⁹⁸ All essential

⁹⁷ Santos, Henrique. "Proceedings of the 8th European Conference on Information Warfare and Security," Military Academy, Lisbon and the University of Minho, Braga, Portugal, 6-7 July 2009. Reading: Academic Pub., 2009.

⁹⁸ Ford, Neil. "New German Cybersecurity Law to Protect Critical Infrastructure," *IT Governance Blog*, July 13, 2015.

service providers must implement cybersecurity systems that meet rigorous BSI standards or face fines ranging from €50,000-€100,000.⁹⁹ Because of this policy, German critical infrastructure is among the most well-protected on Earth.

Similar standards have not yet been implemented in other areas of the private sector. The BSI has formed broad advisory relationships with corporations in other sections of the private sector such as food production and electronics manufacturing, but not to the extent of their involvement in critical infrastructure protection.¹⁰⁰

Potential Vulnerability: Lack of Effective Cyber Crisis Response Capabilities

In compliance with EU-NISA recommendations, Germany has formed a Computer Emergency Response Team (Bund-CERT) that advises federal and private entities on cybersecurity, and assists in responding to cybersecurity crises that exceed local capabilities. Additionally, the German government has formed Mobile Incident Response Teams (MIRT) that can be deployed to adversely affected regions during a cyber incident and assist in restoring normal functions.¹⁰¹ These are effective measures, but the Bund-CERT in its current form still largely serves an information gathering and advising role, and the MIRTs would likely be stretched thin when facing multiple severe attacks at once. Germany is certainly moving in the right direction by developing MIRTs and by beginning to realize the latent potential of the BUND-CERT, but these entities need to receive further investment so that Germany is prepared for a large scale cyberattack.

Estonia

The past decade has been one of remarkable transformation for Estonian cybersecurity. In 2007, during a period of civil unrest, the county was the victim of a massive Russian DDoS attack. For weeks, online banking, internet-based government services, and media networks were unable to operate normally, if at all.¹⁰² Many described the attack as a “wake up call”, and the government soon began implementing policies to prevent the 2007 attack from reoccurring.¹⁰³ Cybersecurity is particularly important to the Estonian “digital republic”, as many of their government services are provided to citizens through the internet,¹⁰⁴ inherently making cybersecurity an extension of national security. Despite these highly constructive efforts, however, Estonia still exhibits some nationwide vulnerabilities, particularly in corporate and critical infrastructure protection.

Best Practices: Real-time Response Capabilities and Effective Public/Private Collaboration

The Information Security Authority (RIA) is the agency responsible for the nation’s cybersecurity, managing the Estonian response team (EE-CERT) that plays a more active role than many of its European counterparts. In addition to responding to crises and providing expertise, the EE-CERT constantly monitors Estonian cyber activity, and resolves infiltrations

⁹⁹ Ford, Neil. “New German Cybersecurity Law to Protect Critical Infrastructure,” *IT Governance Blog*, July 13, 2015.

¹⁰⁰ Federal Republic of Germany, Federal Office for Information Security (BSI), *The State of IT Security in Germany 2016*, July 2016, accessed 31 January 2018. https://www.bsi.bund.de/SharedDocs/Downloads/EN/BSI/Publications/Securitysituation/IT-Security-Situation-in-Germany-2015.pdf?__blob=publicationFile&v=2

¹⁰¹ Federal Republic of Germany, Federal Office for Information Security (BSI), *The State of IT Security in Germany 2016*, July 2016, accessed 31 January 2018.

¹⁰² McGuinness, Damien. “How a Cyberattack Transformed Estonia.” *Bbc.com*, April 27, 2017. Accessed February 14, 2018. <http://www.bbc.com/news/39655415>. <http://www.bbc.com/news/39655415>.

¹⁰³ McGuinness, Damien. “How a Cyberattack Transformed Estonia.” *Bbc.com*, April 27, 2017. Accessed February 14, 2018.

¹⁰⁴ Heller, Nathan. “Estonia, the Digital Republic.” *The New Yorker*, December 18, 2017. December 18, 2017. Accessed February 14, 2018. <https://www.newyorker.com/magazine/2017/12/18/estonia-the-digital-republic>

and incidents as they emerge in real time.¹⁰⁵ The EE-CERT fulfills its duty excellently, and has become increasingly effective in recent years. In 2013 the team resolved over 1,100 cases of cyber incidents over the course of the year, and just three years later, in 2016, the team resolved over 9,000 cases in the same timeframe.¹⁰⁶ Outside of government action, Estonia is on the cutting edge of effective private-public cooperation on cybersecurity. The Cyber Unit of the Estonian Defense League (EDL CU), founded in the wake of the 2007 attacks, is a highly organized volunteer group made up of cybersecurity experts from the public and private sectors that meet frequently to develop cybersecurity best practices, and advise the government and corporations on implementing their strategies. Their work has created strategies that have solidified Estonia's place as a leader in global cybersecurity, and have led to the implementation of sophisticated cyber defenses across the nation.¹⁰⁷ Government agencies, the online services they provide, and select corporate data are all protected by world-renowned Blockchain technology.¹⁰⁸ This standard of protection is unrivaled in Europe, and is nearly peerless globally.

Potential Vulnerability: Lack of Standardized Security Regulations

Despite this excellent progress, Estonia lags behind its neighbors in a few key areas. Estonian regulations on corporate cybersecurity are highly decentralized and vary greatly in their strength.¹⁰⁹ Despite the availability of sophisticated cyber defense tools, certain corporations are not required to implement them. This is particularly worrying in regards to critical infrastructure, where no enforceable cybersecurity standards exist. This problem is compounded by the fact that many Estonian essential service providers are based outside of Estonia, severely curtailing the government's ability to effectively regulate them. However, with new regulations and the implementation of regional infrastructure security standards, this problem could be feasibly solved in the future.

¹⁰⁵Estonia. Information Security Authority (RIA), 2017 Annual Cybersecurity Assessment of the Estonian Information System Authority, accessed 31 January 2018. <https://www.enisa.europa.eu/news/member-states/annual-cybersecurity-assessment-2017-of-estonian-information-system-authority-ria>

¹⁰⁶ Estonia. Information Security Authority (RIA), 2017 Annual Cybersecurity Assessment of the Estonian Information System Authority, accessed 31 January 2018.

¹⁰⁷Kaska, Kadri, Anna-Maria Osula, and LTC Jan Stinissen, "The Cyber Defence Unit of the Estonian Defence League: Legal, Policy and Organisational Analysis," NATO Cooperative Cyber Defence Centre of Excellence, Tallin, Estonia, 2013, accessed 31 January 2018. https://ccdcoe.org/sites/default/files/multimedia/pdf/CDU_Analysis.pdf

¹⁰⁸ Heller, Nathan. "Estonia, the Digital Republic," The New Yorker, December 18, 2017, accessed 14 February 2018. <https://www.newyorker.com/magazine/2017/12/18/estonia-the-digital-republic>

¹⁰⁹ Estonia. Information Security Authority (RIA), 2017 Annual Cybersecurity Assessment of the Estonian Information System Authority, accessed 31 January 2018.

Overview of BSR Civilian Cybersecurity The Baltic Sea Region:

	Strengths:	Weaknesses:
Estonia	<p>EDL-CU develops innovative and highly effective defense strategies for use in the public and private sector;</p> <p>EE-CERT effectively resolves cyberattacks in real time;¹¹⁰</p> <p>Cutting edge technologies like Blockchain widely in use.¹¹¹</p>	<p>No national standard for critical infrastructure security;</p> <p>Essential government services provided online reliant on third party contractors not beholden to (limited) state regulations;¹¹²</p> <p>Russia’s growing hybrid war capabilities increasingly use Estonia as a testing ground.</p>
Latvia	<p>Defense Minister and LIKTA President signed Cooperation agreement to ensure exchange of information and consultation on cybersecurity policy issues and other forms of cooperation between the private and public sector, encouraging representatives to report cyber weakness of companies and private institutional information systems.¹¹³</p>	<p>Besides global threats, homegrown threats are thriving</p> <p>Minority population is vulnerable to Russian subversion (38% Russian-speaking population, and Russia has been cultivating their discontent, spreading disinformation campaigns to destabilize the state);¹¹⁴</p> <p>Lack of cyber defense research/development capabilities</p>
Lithuania	<p>Mature incident response capacity developed by CERT-LT;</p> <p>Reached a strategic stage in national capacity to design cyber resilience strategy, led its implementation.¹¹⁵</p>	<p>Targeted for cyberattacks in higher frequencies than their neighbors: the number of incident reports is dramatically higher than Estonia and is growing significantly;</p> <p>Russia pursues hybrid war tactics in Lithuania at an increasing rate.</p>
Germany	<p>IT Security Act creates enforceable national standards for critical infrastructure security;¹¹⁶</p> <p>BUND-CERT advises government and private sector on defense strategies;</p> <p>MIRTs capable of being deployed to adversely affected areas after an attack.¹¹⁷</p>	<p>BUND-CERT largely advisory, not capable of resolving ongoing cyberattacks;</p> <p>Lack of public-private collaboration outside of critical infrastructure;</p> <p>MIRTs unable to respond to multiple severe crises at once.¹¹⁸</p>

¹¹⁰ Estonia. Information Security Authority (RIA), 2017 Annual Cybersecurity Assessment of the Estonian Information System Authority, accessed 31 January 2018.

¹¹¹ Estonia. Information Security Authority (RIA), 2017 Annual Cybersecurity Assessment of the Estonian Information System Authority, accessed 31 January 2018.

¹¹² Estonia. Information Security Authority (RIA), 2017 Annual Cybersecurity Assessment of the Estonian Information System Authority, accessed 31 January 2018.

¹¹³ Eng.lsm.lv, "Cybersecurity takes center stage," *LSM.LV*, March 28, 2017, accessed 20 February 2018. <https://eng.lsm.lv/article/society/society/cyber-security-takes-center-stage.a230086/>

¹¹⁴ Thorne, Stephen. "Expecting cyber-attacks in Latvia Legion Magazine," *Legion Magazine*, March 1, 2017, accessed 20 February 2018. <https://legionmagazine.com/en/2017/03/expecting-cyber-attacks-in-latvia/>

¹¹⁵ "CYBERSECURITY CAPACITY REVIEW: Republic of Lithuania," *Global Cybersecurity Capacity Centre*, August 2017, accessed 20 February 2018. https://www.nrds.lt/file/repository/resources/Lithuania_Report_10_8_2017_FINAL.pdf

¹¹⁶ Ford, Neil. "New German Cybersecurity Law to Protect Critical Infrastructure," *IT Governance Blog*, July 13, 2015.

<https://www.itgovernance.eu/blog/en/new-german-cyber-security-law-to-protect-critical-infrastructure/>.

¹¹⁷ Federal Republic of Germany, Federal Office for Information Security (BSI), *The State of IT Security in Germany 2016*, July 2016, accessed 31 January 2018.

¹¹⁸ Germany. Federal Office for Information Security (BSI). *The State of IT Security in Germany 2016*. 2016. Accessed January 31, 2018. <https://www.bsi.bund.de/SharedDocs/Downloads/EN/BSI/Pu>

European Union	National CERTs mandated for crisis response; CSIRT network developed to share best practices and respond to regional incidents; EU is sponsoring the creation of transnational Cyber Response Teams. ¹¹⁹	No means of effectively resolving a transnational crisis; No standardized security regulations for member states or for regionally shared infrastructure like cross-border energy grids, or multinational financial corporations.
Finland	Strong expertise in ICT in various areas such as network health; Cooperation between cybersecurity organisations has been promoted. ¹²⁰	ICT expertise is limited to specific areas, there is a lack of comprehensive and multidisciplinary knowledge and cooperation. ¹²¹
Poland	Private business engaged in government-led program (NCCyber), for internal exchange of best practices; CERT Polska has implemented an early warning system for cyber threats. ¹²² National Response Team for Cybersecurity Incidents encourages sharing best practices between CERT Polska and government administration.	Lack of standardized security in industrial sectors of the economy, which is the major contributor to Poland's economy; ¹²³ Lack of security standards in civilian transportation sectors, creating vulnerabilities that are frequently exploited in attacks
Sweden	National cybersecurity standards established for public and government agencies.	No standards for critical infrastructure cybersecurity. Energy grids, and financial sector tend to have particularly weak cyber defenses.

Recommendations for Enhancing Regional Civilian Cybersecurity:

Exporting National “Best Practices” to Regional Partners

Germany and Estonia have developed excellent national cybersecurity strategies that should be emulated by their neighbors. The German IT Security Act that establishes verifiable standards for critical infrastructure cybersecurity is a model that can easily be expanded to the region. A “Critical Infrastructure Protection Working Group” should be established with representatives from Germany, Estonia, Latvia, Lithuania, Poland, Sweden, and Finland to facilitate this process. The main beneficiaries of this process will be the Baltic Republics, and as such, they are the primary targets for engagement. During group meetings, German representatives should share information about their security standards and certification processes and can advise the drafting of comparable legislation or executive orders to be implemented in other states. This provides an

¹¹⁹ Lithuania. Press Service of the President. *Lithuania to manage the establishment of EU cyber teams*. December 15, 2017. Accessed February 1

¹²⁰ Huovinen, Anna. "Is Finland a forerunner in cybersecurity competence?" VTT Blog - VTT:n Blogi. December 08, 2015. Accessed February 15, 2018 <https://vtblog.com/2015/12/08/is-finland-a-forerunner-in-cybersecurity-competence/>

¹²¹ Republic of Finland, Department of Government Communications, Finland's preconditions for cybersecurity capabilities are good - clearer national resolve and deeper cooperation needed, Valtioneuvosto, February 16, 2016. http://tietokayttoon.fi/en/article/-/asset_publisher/suomen-kyberosaamisen-edellytykset-ovat-hyvat-kansallinen-tahtotila-tulee-kirkastaa-ja-alan-yhteistyota-tiivistaa?_101_INSTANCE_QKnBiC19Bd4C_groupId=10616

¹²² "CYBERSPACE PROTECTION POLICY OF THE REPUBLIC OF POLAND." ENISA. June 25, 2013. Accessed February 14, 2018. https://www.enisa.europa.eu/topics/national-cyber-security-strategies/ncss-map/copy_of_PO_NCSS.pdf

¹²³ Swiatkowska, Joanna. "Cyber-security - turning a threat into an opportunity for Poland." SC Media UK, September 26, 2016, accessed 26 February 2018. <https://www.scmagazineuk.com/cyber-security--turning-a-threat-into-an-opportunity-for-poland/article/531645/>

excellent opportunity to better protect critical infrastructure throughout the region, and begin the process of creating uniform security standards for shared essential services. Even though much of the Baltic Republics' critical infrastructure remains outside of their borders, their inevitable transition to a European power grid provides a perfect opportunity for revamping security protocols. Starting this process now ensures that the Baltic states will be excellently prepared to protect their essential services from cyber threats by the time they gain autonomy over their critical infrastructure.

Similarly, Germany and the broader BSR need to take advantage of Estonian expertise. The Estonian EDL CU model should be exported to its regional partners. The strategies developed in the EDL CU's private-public cooperation have led Estonia to the forefront of cybersecurity, and their successes should be replicated elsewhere. Germany (and the other nations of the BSR) should invite EDL CU leadership to give presentations on the unit's structure, competencies, strategies, and history, so that similar organizations can be created within other nations. If willing, the EDL CU leaders should be invited to advise, and even directly contribute to, the formation of these organizations. The strong Estonian tradition of voluntarism and public-private cooperation may make their extraordinary successes unique to their home nation, but the potential benefits of public-private collaboration to cybersecurity should not be overlooked, and the EDL CU model provides the perfect, formal space for that collaboration to occur. However, cooperation should not be limited to EDL CU leadership. Similar invitations should be made to EE-CERT team members, and RIA officials that have pioneered real-time cyber response capabilities, and continent-leading cyber defenses for government services. BUND-CERT, and the region's other CERTs would greatly benefit from Estonian instruction on developing an active response role within a national CERT, as well as their expertise on identifying and quickly resolving cyber infiltrations. As the stewards of the Blockchain cyber defense system that protects the Estonian government's online services, the RIA has extensive knowledge that would benefit each BSR nation. Whether directly consulting BSR governments on developing and implementing Blockchain defenses of their own, or simply describing the best practices they have developed while managing a national cyber-security apparatus, the RIA expertise would improve the cybersecurity strategy of nearly every security conscious BSR government or corporation.

Expansion of CERT Competencies, and the Creation of Regional Response Teams

The EU-NISA framework that establishes national CERTs is an excellent starting point, but these institutions need to be developed and expanded. Outside of the EE-CERT, many of these response teams play largely passive roles in maintaining current levels of cybersecurity. Furthermore, if a large-scale coordinated cyberattack were to occur, national CERTs would be woefully underprepared to effectively respond to the crisis. To bolster their effectiveness, their competencies and personnel must be diversified. First and foremost, engineers capable of restoring disrupted physical critical infrastructure must be added to national CERTs. Germany should take this step as soon as possible and begin advocating for their neighbors to do the same during EU debates. In the case of infrastructure attacks, simply resolving the technological problem or cyber infiltration will not mend damaged pipelines, turbines etc. Having skilled engineers capable of assessing, and quickly remedying physical damage to infrastructure resulting from cyberattacks is an essential part of an effective response. Without having the

personnel and resources to complete both tasks, the CERT's ability to respond to a crisis is inherently handicapped.

To further enhance each Baltic nation's ability to respond to a catastrophic cyberattack, a regional CERT should be founded. EU Cyber Response Teams are already being established under Lithuanian direction, and "BALT-CERT" can easily become one of them¹²⁴. A BALT-CERT would ideally be comprised of engineers and cybersecurity experts from Germany, Lithuania, Latvia, Estonia, Poland, Finland, and Sweden. However, as with the previous recommendation, the Baltic Republics are the primary target for engagement, as they are at the highest risk for state-sponsored cyberattacks. This team would be capable of rapid mobilization and could be deployed to any nation facing a severe cyberattack in order to assist local response teams. With access to international expertise, and multiple national coffers, BALT-CERT would certainly enhance the BSR's ability to respond to an attack. Secondly, deploying foreign nationals to another country as part of a BALT-CERT response would be a deterrent for military action following a cyberattack by serving as a "tripwire". If any harm befalls foreigners on BALT-CERT as a result of armed aggression during their response mission, their home nations would be further obligated to intervene militarily on behalf of the targeted state. Because of this, BALT-CERT would be a manifestation of regional solidarity and defense. Finally, creating a formal institution that brings various experts together will provide a space for the development of best practices and strategies to be shared informally between nations. As BALT-CERT prepares for its mission, or assists national CERTs, best practices will naturally be identified that can easily be disseminated back to the nations that comprise the team.

Enhancing Preparedness Through Regional Cyberattack Drills

To better prepare the region to respond to large cyberattacks, annual regional drills should be conducted. These drills could be a part of the existing EU "Cybersecurity Awareness Month" campaign, or an independent entity. These drills should simulate the conditions of a large-scale cyberattack that targets all aspects of society: telecommunication networks, media outlets, and the energy, financial, and transportation infrastructure. Each year, the drill's host and target of the simulated attack, should rotate so both national and regional response measures can be tested. National CERTs and MIRTs should be given simulated cyber infiltrations and infrastructure failures to resolve in order to hone their skills in responding to real attacks. Additionally, these drills would provide an excellent opportunity to develop the expertise and skills of the previously proposed BALT-CERT. The regional team could be deployed to the host nation during the drill to assist in response measures, and could report back to their home nations with accounts of successful and unsuccessful response strategies. Ultimately, these drills are an excellent way to strengthen state response mechanisms, and deepen regional cohesion.

Furthermore, these drills allow states to educate the public on how to respond to cyberattacks in the hopes of reducing their chaotic and disruptive effects. The sudden blackout of telecommunication networks and media outlets induced by state-sponsored cyberattacks would reasonably cause panic in an unprepared populace. These drills, with their simulated attack conditions, provide the general public with an opportunity to create their own response plans for these crises. Along with the drill itself, the host nation government should hold programs that

¹²⁴ Lithuania. Press Service of the President. Lithuania to manage the establishment of EU cyber teams, December 15, 2017, accessed 1 February 2018. <https://www.lrp.lt/en/press-centre/press-releases/lithuania-to-manage-the-establishment-of-eu-cyber-teams/29038>

educate the public on what cybersecurity threats are, and what to do in the case of an cyberattack. For example, national campaigns can be run that encourage civilians to have alternative methods of communication that do not rely on the internet in case of a massive cyberattack. While these messages are unlikely to prepare 100% of a state's population for a cyber crisis, having even small sections of the population be ready to face such an event would greatly reduce the public panic and unease that can occur when technology suddenly fails.

Conclusion

The Baltic Sea Region has experienced increasing cyber threats against their critical infrastructure from Russia and other hostile actors for a decade. Despite efforts to enhance regional cyber capabilities, the BSR is still far from prepared to prevent or respond to a coordinated, state-sponsored cyberattack. Cybersecurity apparatuses must be improved in order to face the cyber threats posed from Russia and beyond. Russia now possesses the capabilities to easily destabilize a BSR state by simultaneously targeting civilian critical infrastructure, and crucial military defenses. Their doctrine of hybrid warfare poses perhaps the gravest security threat to the modern BSR. NATO has begun to realize this threat, and is beginning to respond accordingly. Cyberattacks have been partially incorporated into Article V, and projects like the CCDCoE are working to improve NATO's cyber capabilities and remedy current cyber defense vulnerabilities. Outside of NATO, Germany and Estonia are at the forefront of cyber defense in the BSR. The best practices developed by these nations can serve as the focal point for regional, and ultimately continental, cybersecurity strategy. Despite these successes, much work must still be done to properly protect the BSR from cyber threats. By implementing the prior recommendations, the BSR will be taking a substantial step towards a more secure future.

Recommendations

1. Enhance Military Cybersecurity:

- *Clarifying Cybersecurity Status under NATO Article V*
- *Coordinating Offensive Cyber Capabilities for Deterrence Purposes*
- *Enhancing NATO/BSR Cyber Defense Awareness through Education and Training*
- *Strengthening NATO/BSR Cyber Defense through Resource Integration*

2. Enhance Civilian Cybersecurity:

- *Exporting National "Best Practices" to Regional Partners*
- *Expansion of CERT Competencies, and the Creation of Regional Response Teams*
- *Enhancing Preparedness Through Regional Cyberattack Drills*

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DISINFORMATION AND ITS IMPLICATIONS

Introduction

The Kremlin has recently pursued a strategy of, “developing its own global media system for the promotion of its worldview[...] to support Russian ‘compatriots abroad’, and to develop the concept of the ‘Russian World’—an ideological space that exceeds the territorial boundaries of Russia.”¹²⁵ Employing a variety of methods to accomplish these goals, Russian groups and media sources (notably Sputnik and RT News) have begun to aggressively disseminate false information, serving to bolster perceptions about the current Russian regime while also providing a framework for argumentation and support of Russian strategies that are counter to the EU’s communicated directives. The Center for European Policy Analysis further states “the aim [of such a strategy] is to destroy trust, sap morale, degrade the information space, help destroy public discourse and increase partisanship” in target areas.¹²⁶

Prime examples of these types of attacks include violent Russian incursions into both Georgia (2008) and Ukraine (2014) that were justified by falsified reports of ethnic-Russian minorities in these regions seeking to return to the “motherland”, as well as their mistreatment by local authorities. Operating under the Russian “compatriot policy”, these tactics served to insidiously target ethnic-Russian communities through employment of the loosely defined “compatriot abroad” as “an opportunity for Russia to use the idea of the protection of compatriots’ rights as a moral justification for interference in internal matters of[...] sovereign states, for the use of military force, and for violations of the territorial integrity of neighboring states.”^{127,128}

While it is typically not the EU’s paradigm, “from the Russian point of view, the information war is primarily being carried out by the “West” and Russia’s aggressive strategies in the informational sphere are but a response to undue attacks on Russia’s sovereignty and discrimination against the Kremlin by the “global media.”¹²⁹ In such a way, the Russian informational campaign is seen by many ethnic-Russians as an attempt at the preservation of Russian identity that was significantly damaged by NATO and its allies in the wake of the Cold War. This paradigm grants important insights into why Russia has sought to promote “fake news” and “fake history” abroad: it seeks to re-establish itself as a legitimate world power respected not for just its military might but also for its history and culture while simultaneously striking at key Western infrastructure systems it views as threats.

¹²⁵ “Russia’s Footprint in the Nordic – Baltic Information Environment” StratCom, (2016-2017): 5.

¹²⁶ Lucas, Edward and Peter Pomeranzev, “Winning the Information War: A Report by CEPA’s Information Warfare Project in Partnership with the Legatum Institute,” Center for European Policy Analysis, (2016).

¹²⁷ “Russia’s Footprint in the Nordic – Baltic Information Environment” StratCom, (2016-2017): 34.

¹²⁸ “Russia’s Footprint in the Nordic – Baltic Information Environment” StratCom, (2016-2017): 55.

¹²⁹ “Russia’s Footprint in the Nordic – Baltic Information Environment” StratCom, (2016-2017): 25.

“Fake News” and its Ties to Russia

- **February 2017** ~ “Emails claiming that German soldiers had raped an underage Lithuanian girl were sent to the president of the Lithuanian parliament and various Lithuanian media outlets.” Consequent investigations proved these claims false and to be of Russian origin, developed as “an attack aimed at undermining the presence of the North Atlantic Treaty Organization (NATO) in Eastern Europe.”¹³⁰
- **February 2018** ~ Following the Parkland, Florida shooting during which 17 students and faculty members of a local high school died, suspected Russian bots flooded Twitter with hundreds of pro-gun control tweets. Bret Schafer, a research analyst with the Alliance for Securing Democracy, postulated that these tweets sought to sow discord among differing sides of the gun-control debate while attracting more viewership that “allows them to then push content that is more directly related to the Kremlin’s geopolitical agenda.”¹³¹
- **March 2018** ~ According to the Latvian government, recent allegations that its central bank governor has engaged in corrupt activity “may be part of a disinformation campaign aimed at damaging trust in the country and influencing October elections.” The structure of the disinformation campaign appeared to be similar to those employed in the American and French elections. Consequently, Russia is currently being investigated as the primary culprit.¹³²

NATO’s StratCom Center of Excellence in Riga lists nine ways that Russia has explicitly sought to accomplish this reincorporation of itself into a world power:

- Employment of disinformation through media
- Promotion of narratives on the internet and through social media
- The use of government-organized non-governmental organizations
- The compatriot policy
- Pipeline diplomacy, or the use of diplomatic measures to support Russian interests, such as in the case of Nord Stream 2
- Economic interdependence with other regional powers
- Encouragement of political radicalization and polarization
- Intelligence operations
- Demonstrations of military force¹³³

Together, these methods influence the domestic climate of Russia and have been employed in other nations as destabilizing forces.

Members of the EU must address these tactics, as the EU’s consensus has been that these methodologies undermine the veracity of popular movements and news sources in the West, specifically in the BSR. Defending against these types of informational attacks is essential to the preservation of several objectives. Preventing and effectively responding to informational attacks in the BSR maintains national cohesiveness among ethnic-Russians and titular citizens of the Baltic States, ensures the validity of elections abroad, secures regional economic interests, and

¹³⁰ Deutsche Welle, “NATO: Russia targeted German army with fake news campaign” *DW.COM*, February 16, 2017, accessed 25 February 2018. <http://www.dw.com/en/nato-russia-targeted-german-army-with-fake-news-campaign/a-37591978>.

¹³¹ Griffith, Erin. “Pro-Gun Russian Bots Flood Twitter after Parkland Shooting,” *WIRED*, 15 February 2018. <https://www.wired.com/story/pro-gun-russian-bots-flood-twitter-after-parkland-shooting>

¹³² Gelzis, Gederts. “Latvian Defense Ministry Says Corruption Claims May Be Disinformation Campaign,” *Reuters*, 20 February 2018. <https://www.nytimes.com/reuters/2018/02/20/business/20reuters-latvia-banking.html>

¹³³ “Russia’s Footprint in the Nordic – Baltic Information Environment” StratCom, (2016-2017): 29-31.

supports institutions that combat the rise of damaging nationalistic movements throughout Europe.

Current defense mechanisms have inadequately combatted the use of Russian disinformation. These mechanisms include investigations by intelligence agencies, discussions by NATO think tanks and most importantly the dissemination of information pertaining to the prevalence of “fake news” and disinformation throughout Europe, mostly in the context of pre-election education by reliable news sources. A notably effective, yet controversial move was Germany’s adoption of the Network Enforcement Act (NEA) in January 2018. While the NEA presents an effective method by which to combat the spread of “fake news”, this report will disregard the possible adoption of similar legislation throughout the BSR due to the act’s widespread international rebuke, its consequent unlikelihood of being employed, and its potential role of restricting freedom of the press.

Concerns Prior to Policy Implementation

The Role of Fake News

With regards to technology, the prevalence of “fake news” and its influence on elections has become a notable threat through the use of mediums such as Facebook, Twitter, and Russian-backed news channels. However, combating disinformation from social media and national sources of news has presented significant concern that journalistic freedom and personal privacy could become marginalized if increased security mechanisms are broadly implemented. The EU, and Germany as an important EU member, should seek to respond to Russian disinformation in the BSR with calculated care, putting first and foremost considerations as to whether policy options will conflict with the EU’s policies on freedom of expression. These considerations will ultimately be fundamental in ascertaining whether such policies will actually be implemented throughout the BSR. The Baltic Republics in particular have explicitly expressed a necessity for internet freedom with Estonia’s president, Kersti Kaljulaid, exhibiting “strong support for human rights, including internet freedom, signaling continuity in internet-related policies.”¹³⁴

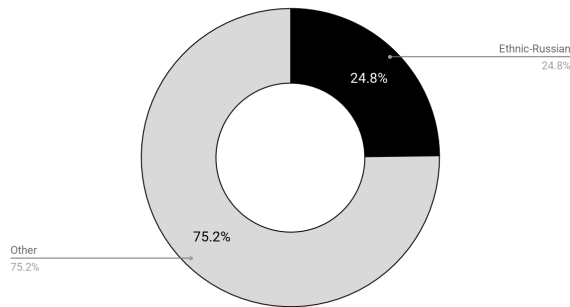
The Russian Speaking Populace

Other concerns pertaining to policy implementation include avoiding the alienation of ethnic-Russian and Russian-speaking minorities in the Baltic Republics, and ensuring that their presence does not lead to the formation of national fifth columns. This is pertinent considering that in Latvia, ethnic-Russians make up 25.6% of the population, in Estonia 24.8%, and in Lithuania 5.8%. Furthermore, in these areas, 26.9% of Latvians, 29.6% of Estonians, and 8% of Lithuanians speak Russian, leading many of them to consume news sources published in Russian that are typically developed by pro-Russian or other highly-questionable entities.¹³⁵

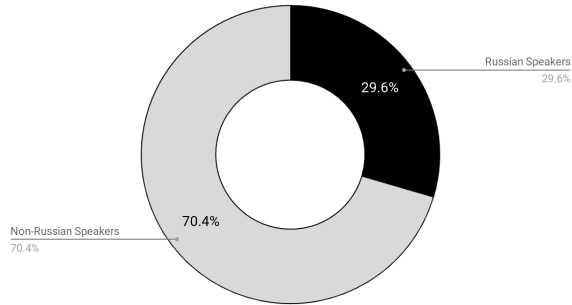
¹³⁴ “Freedom on the Net, Estonia Country Profile,” *Freedom House*, 2017. <https://freedomhouse.org/report/freedom-net/2017/estonia>
¹³⁵ World Factbook 2017, Washington, DC: Central Intelligence Agency, 2017. <https://www.cia.gov/library/publications/the-world-factbook/index.html>

Ethnic-Russian Demographics in the Baltic Sea Region

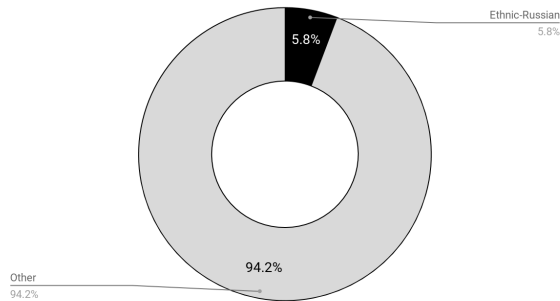
Ethnic Russians in Estonia



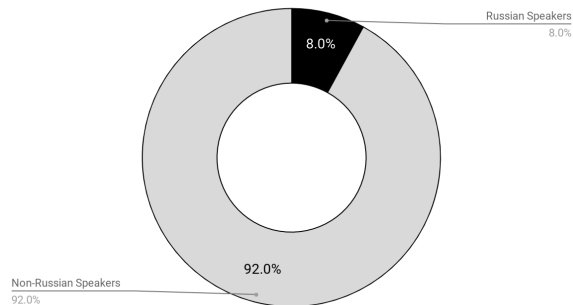
Russian Speakers in Estonia



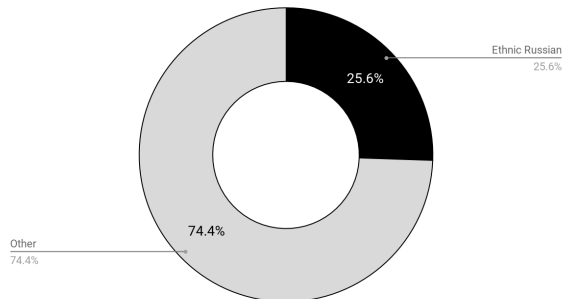
Ethnic Russians in Lithuania



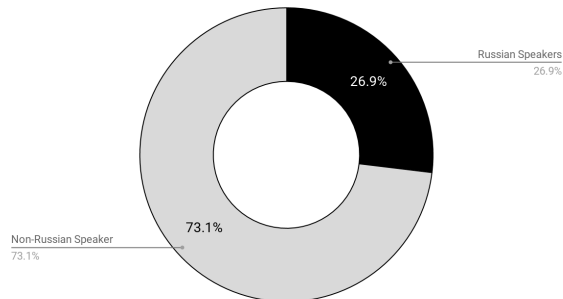
Russian Speakers in Lithuania



Ethnic-Russians in Latvia



Russian Speakers in Latvia



Significant care should be afforded to prevent the use of policies that could be considered in violation of Russia's Compatriot Policy, with a focus on integrating ethnic-Russians into currently existing national systems that may lend them a better sense of belonging. A 2011 study of the ethnic-Russian population of Estonia found that 64% of non-ethnic Estonians were either unable or unwilling to speak Estonian on a daily basis and that, "Estonian media have repeated the accusations that the government in Tallinn has not placed sufficient emphasis on the situation of the local Russian-speaking population, leaving them no option than to belong in Russia's sphere of information and influence."¹³⁶ Since then however, strides have been made in Russian speaking radio sources in Estonia, an example of which, ETV+, has made an effort to reach ethnic-Russians through television by publishing accurate and verified news in the Russian language to minority populated regions.

¹³⁶ Koort, Katja. "The Russians of Estonia: twenty years after," *World Affairs* 177, no. 2 (2014).

In addition to concerns over Russia, there is a fear of German domination throughout the region based on both distant, as well as more recent history. Such concerns should be addressed by implementing transparency mechanisms that allow regional nations to monitor and understand German policy implementation if multilateral agreements are to be pursued in the region, as well as if Germany plans to augment its military spending so as to reach the NATO goal of 2% of national GDP.¹³⁷ These transparency mechanisms could include a data processing register, similar to that found among EU countries for citizens, but only accessible among policymakers in the Baltic Sea region.

Intelligence Note

While Russian intelligence operations are prominent in the BSR and should be addressed, the exact methodology by which countries should combat this is a difficult topic, as the very nature of such operations is clandestine and difficult to ascertain. That being said, the following section will focus primarily on ways to combat informational and hybrid warfare without significant discussion over how Germany and its allies in the region should approach their policies pertaining to intelligence.

Methods for Adapting to Russian Disinformation

Establishing a Regulatory Environment

The regulatory environment of the Baltic Republics will be an important area of policy to develop in the coming years, as Russian tactics will increase in both aggressiveness and effectiveness as their technological prowess grows. The governments of the BSR will thus be tasked with adopting tangible policies that will effectively prevent Russian influence in informational systems, a process that will certainly require the assistance of the EU as an organization. To sustain international support and bolster current defenses on NATO's "eastern front", a stringent strategy of selective regulation will need to be employed. Furthermore, while the majority of Baltic States will typically be receptive to western ideologies (with the exception of Poland), although Lithuania might be problematic as "Lithuania is still closer to other post-Soviet and postcommunist states, including Russia. Some traditional values like respect for authority, institution of family with traditional gender roles and national pride appeal to a considerable part of [the] Lithuanian population. Equally, most political parties follow a socially conservative agenda—even the ones that could be associated with the center left, such as the Lithuanian Social Democratic Party. This increases the potential attraction of Putin's socially conservative agenda."¹³⁸ Furthermore, Latvians as well "feel sentimental and nostalgic for the Soviet era [and] 'More than half would support a pragmatic, neutral or 'softer' approach to Russia and maintaining close political and economic ties."¹³⁹ This indicates that these particular nations and their ethnic-Russian populations are particularly vulnerable to Russian hybrid informational warfare.

The Brookings Institution delineates specific methodologies by which the goals of the EU may be eventually realized throughout this region so as to quell the aforementioned vulnerabilities. At

¹³⁷ Defence Expenditure of NATO Countries 2009-2016. 2017.

http://www.nato.int/nato_static_fl2014/assets/pdf/pdf_2017_03/20170313_170313-pr2017-045.pdf

¹³⁸ Lucas, Edward & Pomeranzev, Peter. "Winning the Information War: A Report by CEPA's Information Warfare Project in Partnership with the Legatum Institute" Center for European Policy Analysis, (2016): 34.

¹³⁹ Lucas, Edward & Pomeranzev, Peter. "Winning the Information War: A Report by CEPA's Information Warfare Project in Partnership with the Legatum Institute" Center for European Policy Analysis, (2016): 34.

the same time, it proposes methods to preserve the soundness of the institutions that guarantee freedom of expression for the area's approximated 6.8 million residents.¹⁴⁰

Grant Incentivization for Effective News Reporting

The Brookings Institution suggests a system of fines for accredited news agencies that run stories which could be considered “fake news” by other accredited news sources. They emphasize that it is important for news agencies “to call out fake news and disinformation without legitimizing them” and further acknowledge that “they can do this by relying upon their in-house professionals and well-respected fact-checkers.”¹⁴¹ In contrast to this type of system however, a system that incentivizes adherence to honest journalism might be more effective, as penalization for sub-par journalistic measures could be construed as an affront to the goals of the free press. A potential system could draw funds first from the EU's €80 billion Horizon 2020 programme for research on how the monetary allocations could best be distributed to combat disinformation. They could then be used to develop an investigative task force that is able to look into the methods by which different international news agencies develop their stories.¹⁴² After this research is accomplished, the European Regional Development Fund would be a viable source of funding for the implementation of a grant system that rewards news agencies (typically in less-developed areas) for journalism that focuses on endorsing accurate news and refuses to legitimize “fake news.” These grants could then be employed to buy better equipment and to bolster advertising for these agencies, hopefully garnering them greater viewership and a more solid reputation. Furthermore, these grants could be utilized most effectively if applied towards bolstering current BSR-run, Russian-language programming like Estonia's television channel ETV+ and Latvia's newspaper *Meduza*, allowing such publications to more adeptly report the news and provide daily programming.

EU Organized Center of Excellence in Media

Before such a program is implemented, it is clear that although the process of fact-checking is typically undertaken on a day-to-day basis by most news outlets, the 24-hour news cycle has led to a system in which the brevity and speed of delivery of information are often overvalued. The consequence of this brevity and speed, however, is that the accuracy and sourcing of published content may be overlooked and inadequately researched. While centers for excellence, such as NATO's StratCom center in Riga, Latvia, currently analyze informational manipulation, “there is no dedicated agency analyzing the impact of Russian (or any other) disinformation in either Eastern or Western Europe on different audiences.”¹⁴³ The partnership of equally affected nations will thus be instrumental in the widespread eradication of Russian disinformation. This presents a viable situation for Germany to assume a role as a regional leader by use of multilateral agreements that provide systemic support for the sharing of valuable information pertaining to disinformation and its consequences. A potential institutional arrangement should staff investigators from multiple countries and should also maintain high levels of transparency and communication with local governments (where policies to combat disinformation will actually be enacted) to achieve maximum effectiveness. The institution should contribute

¹⁴⁰ “Population of the Baltic States,” Tacitus, 2017, <http://www.tacitus.nu/historical-atlas/population/baltic.htm>

¹⁴¹ West, Darrell. “How to combat fake news and disinformation,” The Brookings Institution, 18 December 2017. <https://www.brookings.edu/research/how-to-combat-fake-news-and-disinformation/>

¹⁴² “EU Funding”, European Union, 2018, http://www.tacitus.nu/historical-atlas/population/baltic.htmhttps://europa.eu/european-union/about-eu/funding-grants_en

¹⁴³ Lucas, Edward & Pomeranzev, Peter. “Winning the Information War: A Report by CEPA's Information Warfare Project in Partnership with the Legatum Institute” Center for European Policy Analysis, (2016): 48.

significant resources to developing a system that prevents its reputation from being tarnished by either Russian intelligence operatives or by partisan biases as well.

Germany's role in the process of developing this institutional arrangement throughout the BSR will be fundamental as its mechanisms for identifying and addressing "fake news" in the media are more effectively funded and developed. A pan-European, EU-organized center of excellence that elucidates how target audiences are affected and seeks to share information on how "fake news" and disinformation campaigns are being employed within individual national borders is an important starting point. This center could then work in conjunction with the European Regional Development Fund and its investigative task force to more aggressively tackle issues pertaining to "fake news."

This institution could play a necessary role as an analyzer of regional media sources, working to identify sources that not only contain disinformation, but which also contain hate speech, war propaganda and threats to national security. Prior to this, however, the group should seek to focus on developing a regionally accepted definition of these words, as countries like Ukraine have found difficulties while implementing policy and sanctioning news sources due to inexperience and lack of solid understandings of what these words look like in practice.¹⁴⁴ With clearer, broadly accepted definitions, this proposed regional institution would be able to notify localities of "fake news" and would be able to share valuable information with all nations throughout the BSR, offering an additional line of defense for vulnerable minorities.

Such an undertaking is not without significant difficulties in the realm of abridging the freedom of the press, and the institutional arrangements between Germany and the Baltic Republics should be adopted with great care. This attention will need to be focused on ensuring that important principles of press freedom are not infringed upon, and that this concern is conveyed effectively to a potentially critical public. This is why a pan-European center of excellence might maintain an advantage over government investigative agencies, and it would inherently decrease perceived levels of authoritarianism, at the possible diminishment of immediate effectiveness.

Nationally Organized Online Informational Banners

An additional line of defense that the BSR could employ involves nationally organized online informational banners that could be developed by local media sources. As has been mentioned, the banning of information might alienate ethnic-Russians and may call into question the motives of the institutions involved. However, a system that properly educates individuals who choose to visit questionable websites is another potential solution. Such a system would post notices at the bottom of a user's web browser when it identifies an IP address that visits a controversial, potentially derisive website (like RT or Sputnik News) and would clearly state, in multiple regional languages, that it is:

- Important to check sources
- Encouraged to view all articles with a level of skepticism
- Imperative to note that the website's content is neither endorsed nor fully verified by local government agencies

¹⁴⁴ Lucas, Edward & Pomeranzev, Peter. "Winning the Information War: A Report by CEPA's Information Warfare Project in Partnership with the Legatum Institute" Center for European Policy Analysis, (2016): 50.

While this tactic may not deter users from visiting websites with dubious motives, it will avoid abridging the freedom of the press and will properly let users know that the website they are viewing communicates potentially “fake news.”

Nationally Organized Online Rating System

Crowdsourcing might offer an effective means to identify and deter the sources of fake news. A nationally organized system that allows citizens to individually report on the veracity of news sources with fact-based reviews might provide respite from the effects of “fake news” and disinformation campaigns. By putting the power to comment on such sources in the hands of normal citizens, the combating of Russian disinformation would gain additional credibility, and like crowdsourcing companies such as *Yelp*, would be more effective than a purely government organized system that would have significantly less resources to work with. Furthermore, this system would require a lesser amount of funding as well, as the contributors (citizens) would not have to be paid to contribute, and might contribute out of a sense of civic duty rather than expecting to be reimbursed. Importantly, this type of system would require minimal funds to establish a website and apps to reach the most people possible, and then would have to staff mediators to monitor these resources to ensure that they were not being abused with fake reviews, a situation that would only exacerbate the issue of disinformation. This potential system would employ a rating system, perhaps from A+ to F, to communicate the veracity of a website’s information, and would be readily accessible by all members of BSR countries.

Educational Awareness in Media and Information

The Russian government has created an underscored disinformation campaign that has already had implications that are far-reaching both across nations and within populations. Since disinformation is often tailored to appeal emotionally through local contexts of the targeted audience and by pushing biases, the need for a counter-disinformation strategy through media and information literacy has become urgent.

An increased awareness amongst Baltic populations is necessary in order to battle disinformation, as it is not possible to entirely eliminate false news sources and information in the current complex media environment. Instead of allowing for the proliferation of Russian media programs that notoriously dispense what the EU considers “fake news”, a human rights based approach of promoting the encouragement of media literacy, supportive funding from both national and pan-European level sources as well as more credible alternatives for Baltic Russian speakers should be provided. The best defense for all countries facing “fake news” is a population trained to identify bias alongside media and educational leaders who are active in their roles in advancing media literacy education.¹⁴⁵

Current Media Literacy in Baltic Republics

Estonia

The Ministry of Education and Research of Estonia does not mandate media literacy or technology information competence for upper-secondary schools. However, the Ministry of

¹⁴⁵Sarlo, Alexandra Wiktorek. “Fighting Disinformation in the Baltic States,” Foreign Policy Research Institute, July 6, 2017. <https://www.fpri.org/article/2017/07/fighting-disinformation-baltic-states/>

Research does provide a list of optional subjects that aim to achieve a list of academic competences, including the ability, “to evaluate the relevance and trustworthiness of the information.”¹⁴⁶ Within cross-curricular topics, there is the subject of Information Environment which focuses on the, “use [of] mass media as a source of information. Of more importance is critical assessment of the reliability of information, as the pupils are increasingly beginning to use the information they find when making personal decisions, for instance when choosing further learning opportunities.”¹⁴⁷ The latter should also be included within Information Environment. Although there are curricula for Information and Communications Technology (ICT) and Information, the subjects of Media and Information Literacy (MIL) pertaining to misinformation and disinformation are not currently required or heavily emphasized.

Latvia

On November 8th 2016, the Cabinet of Ministers approved the Mass Media Policy Guidelines of Latvia 2016-2020. Developed by the Ministry of Culture, these are the first mass media policy planning documents in Latvia. The five action items include:

- “1. Diversity of the media environment;
2. Media quality and responsibility;
3. Education of professionals of the media sector;
4. Media literacy;
5. Securitability of the media environment.”

The Ministry of Culture implements measures for the development of, “media literacy in cooperation with other institutions, non-governmental organizations and representatives of the sector.”¹⁴⁸ However, the inclusion of critical thinking training and media literacy in the context of formal education is within the competence of the Ministry of Education and Science and the National Centre for Education.¹⁴⁹

Lithuania

The Ministry of Education and Science of Lithuania formulates and implements the national policy on education and research, although municipal institutions have significant delegated powers to implement the national education policy at a local level. A national strategy on MIL does not exist. However, the concept of MIL is incorporated into education policy documents, including the Information Literacy Framework Programme for Primary Education, and Information Technology Framework Programme for Basic Education. These national guidelines, prepared by the Ministry of Education and Science, on skills and competences for secondary schools incorporate media literacy. These programs supplement methodological resources for teaching media literacy and were implemented nationally by the Education Development Centre in tandem with multiple partners such as the Nordic Council of Ministers Office in Lithuania, the Ministry of Education and Science, the Nordic information Centre for Media and Communication Research NORDICOM, and other national actors in the field of media literacy education. The project aimed to create a platform for dialogue and cooperation among Lithuanian stakeholders and their Nordic counterparts and to create systemic preconditions for

¹⁴⁶ National curriculum for basic schools (2014) Regulation by the Government, passed 6 January 2011, amended August 19, 2014, accessed 28 February 2018. https://www.hm.ee/sites/default/files/est_basic_school_nat_cur_2014_general_part_1.pdf

¹⁴⁷ Government of the Republic of Estonia, Department of Education, *Descriptions of cross-cultural topics*, amended 29 August 2014, Appendix 13 of Regulation No.1, accessed 28 February 2018. https://www.hm.ee/sites/default/files/est_basic_school_nat_cur_2014_appendix_13_final.pdf

¹⁴⁸ “Media Literacy and Safe Use of New Media - EACEA National Policies Platform - European Commission,” EACEA National Policies Platform, accessed 28 February 2018. /national-policies/en/content/youthwiki/68- media-literacy- and-safe- use-new- media-latvia.

¹⁴⁹ “Par Latvijas mediju politikas pamatnostādņu 2016.–2020. gadam īstenošanas plānu.” LIKUMI.LV. <http://likumi.lv/doc.php?id=286453>.

the development of media and information literacy. These practices were based on the Nordic experiences of integrating MIL into general and non-formal education.¹⁵⁰

The concept and content of MIL programs are planned to be fully included in regulatory curricula documents, including primary, basic and secondary education standards, educational plans and common programmes by 2020.¹⁵¹ Although MIL has not yet been implemented or incorporated into national curriculum, Information and Communications Technology (ICT) is taught in primary and secondary schools as a general tool for other subjects, while in secondary schools, ICT is taught as a separate subject.¹⁵²

Areas of Prospective Growth

Although several states in the BSR have initiated some form of MIL, there are still difficulties in properly implementing effective MIL programs. The "Quality of youth career guidance and nowadays media literacy" project, supported by the Erasmus+ Programme of the European Union, researched six countries, including Lithuania, to determine their current relation to modern media and the literacy of their younger populations. The findings of the research were then used for the development of the following learning outcomes and quality indicators of media literacy.

- Through research of six partner states, the project discovered lack of preparation in MIL education, lack of motivation to teach/learn MIL, and episodic/rare trainings for MIL as weaknesses in MIL in all states.¹⁵³

The European Commission's Information Society and Media Literacy Unit report has also listed the following critical understanding concepts as necessary for effective media literacy amongst member state populations:

- Trust of information that is presented by different media sources (newspapers, television, radio, Internet);
- Awareness of information that is presented by different media sources (different television channels, different news programs, different search engines);
- Awareness of the influence of advertising;
- Knowledge of media regulations;
- Ability to identify options for gathering information;
- Comparison of information across sources;
- Skills in managing privacy and protecting oneself from unwanted messages.¹⁵⁴

¹⁵⁰ "Media Literacy and Safe Use of New Media - EACEA National Policies Platform – European Commission," EACEA National Policies Platform, accessed 28 February 2018. /national-policies/en/content/youthwiki/68- media-literacy- and-safe- use-new- media-lithuania.

¹⁵¹ "Media Literacy and Safe Use of New Media - EACEA National Policies Platform – European Commission," EACEA National Policies Platform, accessed 25 February 2018. /national-policies/en/content/youthwiki/68- media-literacy- and-safe- use-new- media-lithuania.

¹⁵² Erasmus +., Summary needs assessment report in terms of modern media literacy for Bulgaria, Austria, Lithuania and Turkey "QYCGUIDANCE – QUALITY OF YOUTH CAREER GUIDANCE AND NOWADAYS MEDIA LITERACY." Summary needs assessment report in terms of modern media literacy for Bulgaria, Austria, Lithuania and Turkey. Erasmus + Programme of the European Union; 7. http://ec.europa.eu/programmes/proxy/alfresco-webscripts/api/node/content/workspace/SpacesStore/b182677a-1a9d-464b-b091-34a22ae3bd73/needs_report_qycg.pdf

¹⁵³ Erasmus +., Summary needs assessment report in terms of modern media literacy for Bulgaria, Austria, Lithuania and Turkey "QYCGUIDANCE – QUALITY OF YOUTH CAREER GUIDANCE AND NOWADAYS MEDIA LITERACY."

¹⁵⁴ Directorate-General for Education and Culture (European Commission), Directorate-General for the Information Society and Media, *Testing and Refining. Criteria to Assess Media Literacy Levels in Europe: Final Report*, 27 August 2013, 5. <https://publications.europa.eu/en/publication-detail/-/publication/4cbb53b5-689c-4996-b36b-e920df63cd40/language-en>

Formal Education

Incorporate Media Literacy into School Curricula

Due to widespread awareness of the Russian disinformation threat, MIL to teach critical assessment skills when analyzing media must be compulsory in national curricula in order to make Baltic populations less susceptible to modern warfare tactics. Since each state is responsible for its own educational policies, the EU has limited authority over educational legislation. However support of national education system regarding programs to improve MIL in the Baltic Republics can be made through joint efforts of the EC, EU, and NATO. Through the EC, MIL can be improved through an increase in initiatives and funding programs and through the EU and NATO, MIL policies and legislation can be coordinated amongst member states on the best practices based on expert group findings. The best way to ensure teachers and school systems are provided with support is to pass legislation in every state that would incorporate media literacy into schools' curricula.

Training for Educators

To ensure effective media literacy in national curricula, training for educators should be comprehensive.¹⁵⁵ Recognizing that achieving MIL for all BSR citizens requires national policies, UNESCO has published a Media and Information Literacy Policy and Strategy Guideline. These guidelines support the development of MIL competencies while providing initial information through its Media and Information Literacy Curricula for its member states, such as assessment frameworks to improve country readiness and competence.

Media literacy training courses should be created for primary and secondary school teachers and be required by all Educational Ministries to combat the growing threat of disinformation. The Ministries in charge of educator training, licensing, and development should not only incorporate media literacy into initial training, but should also include it in professional development and recertification. Media literacy training should also be regularly updated to keep up with the rapidly developing media environment. Media literacy educator training sessions should be provided at reduced-costs or for free if possible, in order to remain easily accessible to educator

Education Evaluation and Assessment

Certifying teachers' competencies and testing students' progress is essential to ensuring that media literacy curriculum works. To evaluate and assess the success of an educator's curricula, tools such as standardized testing, computerized adaptive testing, and assessment workshops for qualitative and quantitative indicators should be developed in addition to surveys which evaluate learning outcomes for students and teachers, as well as for educational and policy institutions.¹⁵⁶ UNESCO recognizes the need to provide its member states and policy makers, with the appropriate assessment tools, methodologies, and guidelines to generate valid and reliable data for strategic planning, development, monitoring, and implementation purposes.¹⁵⁷ The UNESCO Framework measures country readiness through its national adaptation process and then provides a comprehensive guide from which states can then measure their results and make informed MIL decisions adapted specifically for their own citizens. Using the UNESCO Framework,

¹⁵⁵ Paolo Celot, "Media Literacy European Policy Recommendations," European Association for Viewers Interests, May 2016, accessed 28 February 2018. <https://eavi.eu/wp-content/uploads/2017/08/eavi-2014-media-literacy-eu-policy-recommendations.pdf>

¹⁵⁶ Celot, Paolo. "Media Literacy European Policy Recommendations," European Association for Viewers Interests, May 2016, accessed 28 February 2018.

¹⁵⁷ "Global Media and Information Literacy Assessment Framework: Country Readiness and Competencies," UNESCO, 2013, accessed 28 February 2018. <http://unesdoc.unesco.org/images/0022/002246/224655e.pdf#page=22>

STRATCOM can create effective assessment tools based on BSR regional criteria specifically pertaining to Russian disinformation that can be used effectively by the BSR.

Curriculum Material Access for Educators

Teaching resources should be made fully accessible to teachers through state and EU approved online resources, and curricula should be accessible in regional languages. The UNESCO Global Media and Information Literacy Assessment framework already offers methodological guidance and practice tools such as books, questionnaires, and computerized adaptive testing for teachers regarding media and information literacy, that can be replicated on an EU or state level.

Although UNESCO already provides MIL Framework and individual states have their own resources from which educators can access, an EU wide portal for media education should be created which allows registered users to access lecture plans, seminars, education materials and publications. Through this online portal, educators can utilize teaching resources developed and approved from actors such as UNESCO, STRATCOM and other MIL NGOs. They can also network, and upload their own material thus resulting in an EU wide intercultural exchange and dialogue on a MIL platform.¹⁵⁸ Beyond state and government funding, various sources may also be utilized including the European Union Structural Funds (ERDF) programs for developing media education. The ERDF Region Development Fund specifically focuses on thematic concentrations such as innovation and research, and the digital agenda, which can be used to provide proper media and technology platforms for all educators in the BSR, thus correcting any MIL implementation imbalances in the region.¹⁵⁹

After national curricula are made and implemented by each state, national competency standards of media literacy should be set through the policy direction of the EC with the guidance of StratCom in order to assess all competency issues with each state's existing environment.

For formal education in the BSR, educational reforms have included introductions to media education and literacy. Attention to mass media and ICT is also present and is intended to change and reform new curricula in projected policy guidelines. Before these education policy reforms, "media education in the curriculum was focused on mass media (press, radio, film and television). With the development of ICT, interest was redirected from mass media to digital media."¹⁶⁰ As Russia continues to spread disinformation, EU countries should identify and spread the best practices of media literacy and public awareness campaigns in each area. Also included in the compulsory curricula for primary, secondary, post-secondary schools should be knowledge of media regulations and law, and critical thinking skills to discern fact from fiction, understand bias, fact-check, and source check.

Promoting Successful Educational Policies Regarding Media Literacy

Established Media Literacy Programs

Following the 2007 Cyberattacks in Estonia, and Russia's annexation of Crimea in 2014, countries in the BSR and Eastern European countries have seen a substantial increase in "fake

¹⁵⁸ Celot, Paolo. "Media Literacy European Policy Recommendations," European Association for Viewers Interests, May 2016, accessed 28 February 2018.

¹⁵⁹ "Global Media and Information Literacy Assessment Framework: Country Readiness and Competencies," UNESCO, 2013, accessed 28 February 2018.

¹⁶⁰ "Study on the Current Trends and Approaches on Media Literacy in Europe." Gabinete de Comunicación y Educación, June 26, 2015; 48. "Libro.Pdf." n.d. Accessed February 28, 2018.

news” and propaganda intending to undermine public confidence in governments and institutions. Many European states have attempted to target disinformation and propaganda, but in the information war with Russia, Finland has proven to be one of the most prepared and resilient states. Finland’s policy of media literacy and their publics’ resistance to Russia’s “fake news” stories provide an example of MIL policy and media education that other BSR and European states could replicate.

The four goals of media education in Finland for 2013–2016 are:

1. Implementation of high quality everyday media education centered around children and young people implemented;
2. Legislative funding with national and municipal level steering, establishing sustainable structures for promoting media literacy;
3. Activities and various stakeholders in media education will become pro-led, networks will be reinforced, and new partnerships will be created in the area;
4. Finland will play an active role in global media education activities.¹⁶¹

The Finnish Model of Media Literacy

Finland’s success is due to its role not only as a promoter of its own media literacy but as a promoter of media literacy as an international issue. Finland works closely with UNESCO, the EU, and the rest of the Nordic countries in the area of media education, while, “Finnish NGOs, researchers, and authorities have taken part in various international, European and Nordic cooperation forums for a considerable period of time.”¹⁶² The 2013-2016 policy guidelines for Finland emphasize the need to continue participation in the European Union’s Safer Internet network and to, “influence at the global level by being involved in planning and advancing new openings to promote good media literacy.”¹⁶³ Follow-up and monitoring of Finland’s 2013-2016 goals by media education expert panels set up by the Ministry of Education and Culture successfully led to the research and production of policy guidelines at the national, regional and local level. After evaluation by these experts, new policies were made and existing ones improved for 2017 onwards.¹⁶⁴

Professional Training

Long-Term Education

Media literacy should be taught beyond primary, secondary, and university classrooms to ensure all populations and ages can understand the differences between properly researched journalism, opinion, and commentary. Populations outside of the sphere of public education should also be provided with the opportunity to learn and update their skills on a regular basis. Older populations out of school should be reached as well so that the benefits of media literacy are not confined to students and young people.¹⁶⁵ To reach adults out of school, media literacy training

¹⁶¹ *Finnish Media Education – Promoting Media Literacy and Information Literacy in Finland*. National Audiovisual Institute, Finland, Helsinki, accessed 26 February 2018. https://kavi.fi/sites/default/files/documents/mil_in_finland.pdf.

¹⁶² “Good Media Literacy - National Policy Guidelines 2013-2016,” *Ministry of Education and Culture, Finland*: Department for Cultural, Sport and Youth Policy, accessed 28 February 2018, 28.

¹⁶³ “Good Media Literacy - National Policy Guidelines 2013-2016,” *Ministry of Education and Culture, Finland*: Department for Cultural, Sport and Youth Policy, accessed 28 February 2018, 28. <http://julkaisut.valtioneuvosto.fi/bitstream/handle/10024/75280/OKM13.pdf>.

¹⁶⁴ “Good Media Literacy - National Policy Guidelines 2013-2016,” *Ministry of Education and Culture, Finland*: Department for Cultural, Sport and Youth Policy, accessed 28 February 2018, 28.

¹⁶⁵ Potter, W. J., “The State of Media Literacy,” *Journal of Broadcasting & Electronic Media* (2010), Broadcast Education Association. 54, 675-696, accessed 28 February 2018. <http://mysite.dlsu.edu.ph/faculty/marianog/publish/potter.pdf>.

“Potter.Pdf.” n.d. Accessed February 28, 2018. <http://mysite.dlsu.edu.ph/faculty/marianog/publish/potter.pdf>.

should be provided for librarians and community center leaders so they can teach workshops and programs for adults in their local areas. Funding from local governments and education ministries should also be provided to ensure media literacy programs, grants, and technologies reach communities outside of urban areas as well as communities with large Russian-speaking populations. To ensure MIL reaches all populations, states of the BSR should foster the inclusion of media literacy into initiatives that focus on at risk and minority groups. Promoting good media literacy must be incorporated into municipal level planning as local governments and authorities manage sectors such as libraries, community centers, youth projects, and museums.

Media Literacy for Journalists

MIL should not only apply to educational institutions but to journalism programs and organizations as well. A basis for journalism ethics and integrity should be solidified through media literacy programs for professional journalists and journalism students. In order to provide credible information to audiences, journalists should be educated on how to think critically about media, discern fact from fiction, news from opinion, and trusted from untrustworthy. Media literacy curricula for journalists should be a required part of ongoing professional development with annual workshops and re-certifications. The EU should also require MIL training and certificates as an employment requirement for all accredited publishers and news firms. Accredited journalism unions, librarians, and universities should be provided funding directly through grants and subsidies. ICT and MIL support through private actors can fund learning materials and media education developments. In addition, technical assistance through STRATCOM, national media agencies and education ministries should be provided in order to guarantee state-institutions ability to teach students and citizens. One example of promoting Baltic journalism through grants and NGO support is the U.S. Department of State's funded program entitled "Supporting Independent Media in the Baltics", which provides competitive grants and funding to NGOs and other applicants with projects aimed to improve the competitiveness of credible, professional media, and foster expanded domestic audiences for fact-based, reliable information.

The EC should promote each state's Ministry of Education to allocate funding not only for educators in public institutions but educators in professional development institutions, such as information and communication professional associations, and teacher training institutions.¹⁶⁶

Continued Research

Further research on "fake news", propaganda, and disinformation is needed to prove the importance of countering false stories and showing how receptive audiences are to such tactics. It is evident that the, "continued monitoring and study of disinformation techniques by computer scientists, political scholars, security services, and journalists can contribute to a better understanding of how disinformation is created and disseminated, and may spark new techniques for how to counter it. In the face of rapidly advancing technology, knowledge in these areas must constantly be updated and published."¹⁶⁷

As media literacy is integrated in curricula across Europe and the BSR, national institutions must be able to decide which forms and subjects are the most effective. Government actions and

¹⁶⁶ "Global Media and Information Literacy Assessment Framework: Country Readiness and Competencies," *UNESCO*, 2013, accessed 28 February 2018.

¹⁶⁷ Sarlo, Alexandra Wiktoerek. "Fighting Disinformation in the Baltic States." *Foreign Policy Research Institute*, July 6, 2017.

policy can provide funding through investment, subsidies, support, and rulings to establish methods and improve conditions.

Research should also be conducted at the European level. Such research ensures that media literacy is not just a focus of the Baltic Sea states, but anywhere that “fake news” exists. Although media disinformation is not a new concern for the BSR, it is a growing one, which is why research on media literacy and disinformation prevention strategies is important not only on the European level but also on the state level as well. Research is needed in each individual BSR state to differentiate solutions and scenarios of actions that take into consideration each state’s dynamic technological, political, economic, social and cultural environment.

NATO StratCom Center of Excellence already researches and analyzes trolling, data exploitation and issues in social media, but research is needed in each individual BSR state to differentiate solutions and scenarios of actions that take into consideration each state’s dynamic technological, political, economic, social and cultural environment. These high levels of quality research can be achieved through joint effort in the EU Organized Center of Excellence in Media or through a new center of European MIL Excellence and Research created under the Council of Europe or EC. Through these Centers, sharing of mediums through cross-country collaboration on media research will help the Baltic states work alongside the Nordic states in order to benefit from a “systematic approach sharing information about national contexts, policy interventions, methods of assessment, and promising practice.”¹⁶⁸

Conclusion

Russian hybrid warfare and the issue of disinformation continues to plague the BSR. It is imperative that NATO, the EU, and Germany, as an important regional player, recognize this and properly respond. While the utmost care must be taken to ensure the preservation of fundamental rights possessed by the press, there are viable options to combat “fake news” that may be pursued at relatively low cost and potentially high effectiveness. The development of regulatory agencies specifically aimed at deterring the use of “fake news”, like an EU-organized Center of Excellence in Media and a Regional Center of Excellence in Media, are important starting points that may offer insight into how “fake news” is developed and what agencies aid its dissemination. These Centers of Excellence, with the aid of grants, may directly contribute to a more cohesive and resilient BSR that recognizes Russian disinformation tactics and actively works to combat them. Additionally, the regulatory environment of the BSR may be strengthened by the use of nationally developed online banners that provide useful tactics for users to develop more effective media literacy skills and identify websites that may be promoters of questionable news.

As false news and propaganda increasingly reach BSR populations, it has become more important to educate local populations on how informational warfare affects political discourse by appealing to emotions rather than communicating actual facts. By making media and information literacy compulsory in both academic and professional settings, both general and professional populations of the BSR will be able to take into account the emotional and affective dynamics of news consumption and social media networks. Through continuous funding and

¹⁶⁸“Study on the Current Trends and Approaches on Media Literacy in Europe.” Gabinete de Comunicación y Educación, June 26, 2015; 48, accessed 28 February 2018. <http://www.gabinetecomunicacionyeducacion.com/sites/default/files/field/adjuntos/libro.pdf>.

support, media literacy can be promoted using up-to date research, studies, and data which can then lead to successful evaluation and implementation of curricula and programs across the BSR. These structures could be easily sustainable and the promotion of media literacy can be achieved through legislation and cooperation through the European level. Together, regulatory and educational mechanisms to combat disinformation from Russian sources could serve as effective means to prevent further Russian incursions into sovereign political and social processes in the BSR.

Regulatory Recommendations

Adopt Grant Incentivization for Effective News Reporting

- *Draws research funds from European Horizon 2020 program and grant funds from the European Regional Development Fund*
- *Incentivizes, effective media development through grants that bolster media sources*

Create an EU Organized Center of Excellence in Media

- *Employs an investigative task force that investigates agencies promoting fake news*
- *Works in conjunction with European Regional Development Fund*
- *Seeks to define difficult terms in the realm of disinformation*

Establish a Nationally Organized Online Banner System

- *Identifies and labels questionable websites as potential promoters of “fake news”*
- *Posts notices on said websites encouraging intelligent news consumption*

Establish a Nationally Organized Online Rating System

- *Utilizes crowdsourcing as a means of identifying questionable websites and rates them on their level of veracity*
- *Rates websites on an A+ to F scale to inform readers of website information*

Educational Recommendations

Adopt a compulsory MIL curriculum

- *Establishes a required curriculum and delineates specific resource use*
- *Develops curricula and methodological material based on regions’ identified needs using best examples from Nordic countries*

Require MIL training, certification and recertification for employment

- *Requires MIL skills and training as employment prerequisites for journalists, professionals and publishers*
- *Creates mandatory workshops for ongoing professional development and recertification*

EU Organized MIL Access Portal for Educators

- *Provides systems and resources for guidance and consultation*
- *Provides access to MIL materials, resources and tools in all languages*

Promote further scientific and education research on media literacy

- *Shares information among member-states on methods, data, successful practice and policy environments*
- *Promotes cross-country collaboration on regional research and data collection to create new content, guidelines, and skills*

Promote the development and Influence of Baltic-State Russian-language media resources

- *Creates and incentivize through grants and programs Russian-language media outlets with reliable consistency of comprehensive news*
- *Uses campaigns to achieve MIL and journalism objectives, promote actions and spread of information*

ENERGY

Introduction

The legacy of Soviet infrastructure has left states in the Baltic Sea Region almost entirely dependent on Russia for their energy needs. In response to this reality, the European Union has pursued a European wide Energy Union with the intention to combine resources, increase energy efficiency, and better integrate renewable energy into a wider system. Currently the BSR is facing a number of challenges regarding its lack of energy independence in the oil and gas sector, a mismatch in needed infrastructure, and the need to increase the share of renewably generated power.

The Baltic Republics overwhelmingly rely on Russian energy resources, paying some of the highest energy prices in the EU due to a lack of diversification in energy supply. This makes them particularly vulnerable to manipulation by Russian-backed energy companies such as Gazprom. For example, Russian oil and gas cutoffs to Lithuania, Latvia, Estonia, and Ukraine, in 2003, 2006, 2007, and 2014 respectively, demonstrated how Russia can use its energy weapon when it perceives its interests are threatened.¹⁶⁹ Prior to the construction of the Lithuanian LNG terminal at Klaipėda, all three Baltic Republics and Finland were 100% dependent on Russian natural gas.¹⁷⁰ As of 2015, Latvia and Lithuania were still 100% dependent on Russia for oil, while Estonia, due to large shale reserves, had reduced its imports of Russian oil by 39%.¹⁷¹ The Baltic Republics fare better in renewable energy, as all three are set to exceed the ‘20% energy from renewables’ target set by the EU by 2020, yet there is still significant room for improvement.¹⁷² Finally, gas and electrical infrastructure in the BSR still lags behind that of Northwest Europe. The Baltic Republics have been described as “energy islands” due to their lack of interconnection with the rest of the EU, while other states in the region, like Poland and Finland, still have several areas of improvement that must be addressed. In light of this, the need for greater interconnection and cross border energy infrastructure is paramount.

Natural Gas in the Baltic Sea Region

Current State of the European Natural Gas Market

Natural gas plays a critical role in the BSR’s energy sector. Currently the states of the BSR import most of their natural gas from Russia, leaving them vulnerable to Russian manipulation through natural gas resources as a tool to advance its geopolitical interests. The BSR should strive for greater energy security, and do so by building facilities that can import more liquefied natural gas (LNG) from the United States, the Middle East (particularly Qatar), and African nations such as Cameroon and Mozambique. Furthermore, they should increase gas storage capacity and infrastructure interconnection, while using natural gas as a transitory bridge between fossil fuels and renewable energy.

¹⁶⁹ Agnia Grigas. “The Case of Pipeline Politics.” *The Politics of Energy and Memory between the Baltic States and Russia*, Routledge, 2016, pp. 49–75.

¹⁷⁰ Bryza, Matthew J. & Tuohy, Emmet C. “Connecting the Baltic States to Europe’s Gas Market.” *Tallinn: International Center for Defense Studies Report*, March 2013. <https://www.icds.ee/fileadmin/media/icds.ee/failid/Bryza%2C%20Tuohy%20-%20Connecting%20the%20Baltic%20States%20to%20Europe%27s%20Gas%20Market.pdf>

¹⁷¹ “Oil Import Dependency 1990-2015” Eurostat, Accessed 8 February 2018.

¹⁷² “Summary of the Member State Forecast Documents”

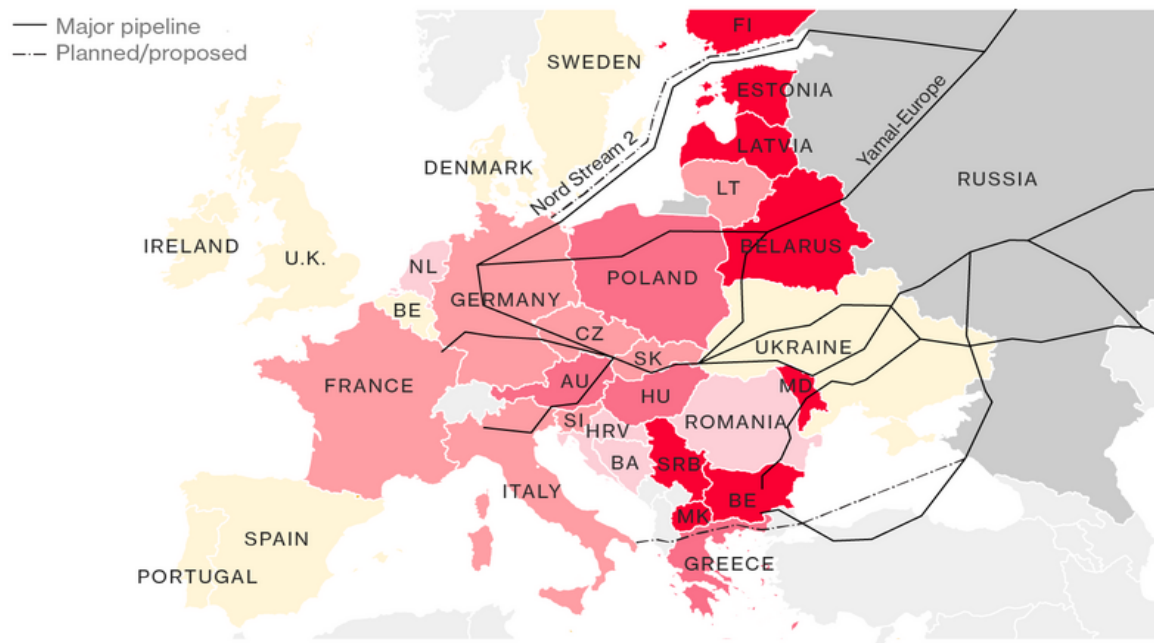
https://ec.europa.eu/energy/sites/ener/files/dir_2009_0028_article_4_3_forecast_by_ms_symmary.pdf

The European Union consumed 16.958 trillion cubic meters (tcm) of natural gas in 2016,¹⁷³ though it only produces roughly 4.605 tcm of natural gas annually.¹⁷⁴ As a result of this production shortfall, the EU is reliant on foreign gas imports, importing 24.123 tcm of natural gas annually.¹⁷⁵ Most of Europe’s natural gas supply comes from two countries: Norway, which provides 26.9% of the EU’s gas imports, and Russia, which supplies 18.3%.¹⁷⁶ Germany is the EU’s largest consumer of natural gas, importing 49.83 bcm of natural gas from Russia annually,¹⁷⁷ representing 63.3% of all German natural gas imports.¹⁷⁸ This reliance on Russian natural gas will grow in the coming years, as nuclear plants close, Dutch natural gas supplies dwindle,¹⁷⁹ and the demand for cleaner energy continues to grow.

Who’s Dependent on Russian Gas?

About a third of Europe’s gas comes from Russia

Share of gas from Russia 0% Less than 20% 20-49% 50-74% 75-100% No data



Source: ACER

BloombergQuickTake

Nord Stream 2

Several European companies and Gazprom are currently developing the Nord Stream 2 pipeline, which would extend from Ust-Luga, Russia to Greifswald, Germany, complementing the original

¹⁷³ “Natural Gas Consumption Statistics: Statistics Explained,” Eurostat, accessed 16 January 2018. http://ec.europa.eu/eurostat/statistics-explained/index.php/Natural_gas_consumption_statistics

¹⁷⁴ “Natural Gas Consumption Statistics” Accessed 16 January 2018.

¹⁷⁵ “Natural Gas Consumption Statistics” Accessed 16 January 2018.

¹⁷⁶ “Natural Gas Consumption Statistics” Accessed 16 January 2018.

¹⁷⁷ “Delivery Statistics: Gas Supplies to Europe,” *Gazprom Export*, accessed 16 January 2018. <http://www.gazpromexport.ru/en/statistics/>

¹⁷⁸ Shiryavskaya, Anna and Brian Parkin, “Plan Underway to Subdue Russian Gas With German LNG Terminal,” *Bloomberg News*, November 27, 2017, accessed 23 January 2018. <https://www.bloomberg.com/news/articles/2017-11-27/plan-underway-to-subdue-russian-gas-with-german-lng-terminal>

¹⁷⁹ Shiryavskaya and Parkin “German LNG Terminal” Accessed 23 January 2018.

¹⁸⁰ Martewicz, Maciej. “Poland Says Goodbye to Russian Natural Gas After 74 Years,” *Digital Image, Bloomberg*, 8 February 2018. www.bloomberg.com

Nord Stream pipeline, which also terminates in Greifswald.¹⁸¹ European natural gas production is in decline, thus foreign natural gas imports will increase dramatically over the next 50 years. Russia has one of the largest reserves of natural gas in the world, with an estimated 48 trillion cubic meters (tcm) of natural gas reserves, enabling it to meet the EU's demands as European production declines.¹⁸² Once completed, Nord Stream 2 will have the capacity to ship 55 bcm of natural gas per year, doubling the transport capacity of the original Nord Stream pipeline.¹⁸³

While Nord Stream 2 can help meet Europe's growing energy needs, Nord Stream 2 has been highly controversial amongst several EU members and between allies. Poland and other transit states fear that Nord Stream 2 will further entrench EU energy dependence on Russia,¹⁸⁴ and are wary of providing Russia with more revenue and regional bargaining tools.¹⁸⁵ The US has passed measures in response to Nord Stream 2, enabling the US President to place sanctions on companies that help Russian energy exploration, including the possibility to sanction European companies involved in developing Nord Stream 2.¹⁸⁶ This project highlights the need for more diverse sources of natural gas, in order to better secure diversification in the BSR.

Liquefied Natural Gas

A major shift has occurred in the European natural gas market in the last few years as the United States, and other major gas producing countries, have begun exporting liquefied natural gas (LNG) to the continent. New technologies such as hydraulic fracturing and horizontal drilling, have enabled US companies to drill for gas in shale formations,¹⁸⁷ and several states in the BSR have decided to start importing LNG from the United States, Norway, and the Middle East as a result. The most notable of these is Lithuania, which in 2014 built an LNG terminal in Klaipeda, which can supply Lithuania with 60% of its natural gas needs.¹⁸⁸ This allowed Lithuania to gain a 23% price concession from Russia, a notable feat for a state which was previously completely dependent on Russian gas.¹⁸⁹ The other notable state that has taken advantage of LNG is Poland. Poland built an LNG terminal in Swinoujscie in 2009, becoming the first Eastern European state to import American natural gas.¹⁹⁰ Another source of LNG is the Middle East, particularly Qatar, which already supplies natural gas to Poland, recently raising the amount of gas shipped to Poland from 1.5 bcm to 3 bcm annually.¹⁹¹ Additionally, Qatar plans to increase natural gas production from 95.2 bcm to 136 bcm, allowing them to export more natural gas and serve as a

¹⁸¹ Stern, Jonathan. "Natural Gas in Europe: The Importance of Russia," Oxford Institute for Energy Studies, October 2014.

<https://www.oxfordenergy.org/wpcms/wp-content/uploads/2014/10/NG-92.pdf>

¹⁸² "Nord Stream 2," Gazprom, accessed 30 January 2018. <http://www.gazprom.com/about/production/projects/pipelines/built/nord-stream2/>.

¹⁸³ "US Says Planned Russian Pipeline Would Threaten European Energy Security," US News and World Report, January 27, 2018, accessed 28 January 2018. <https://money.usnews.com/investing/news/articles/2018-01-27/uss-tillerson-says-nord-stream-2-pipeline-would-undermine-europes-energy-security>

¹⁸⁴ Gurzu, Anca. "Nord Stream 2 Fight Set to Heat up as Countries Show Their Cards," POLITICO, 8 September 2017.

www.politico.eu/article/nord-stream-2-fight-set-to-heat-up-as-countries-show-their-cards/

¹⁸⁵ "US Says Planned Russian Pipeline Would Threaten European Energy Security" *US News and World Report* Accessed 28 January 2018.

¹⁸⁶ Stulberg, Adam. "Out of Gas? Russia, Ukraine, Europe, and the Changing Geopolitics of Natural Gas" *Problems of Post-Communism* 62 no. 2 (2015) pg. 112-130

¹⁸⁷ BoussBoussena, Sadek and Catherine Locatelli, "Gazprom and the Complexity of the EU Gas Market: A Strategy to Define," *Post-Communist Economics* 29 no. 4 (2017) pg. 556.

¹⁸⁸ Stulberg, Adam "Out of Gas?" pg. 122

¹⁸⁹ Krauss, Clifford. "Boom in American Liquefied Natural Gas Is Shaking Up the Energy World," *The New York Times*, October 16, 2017, accessed 29 January 2018. <https://www.nytimes.com/2017/10/16/business/energy-environment/liquefied-natural-gas-world-markets.html>

¹⁹⁰ "UPDATE 2-Qatargas Agrees to Double LNG Supplies to Poland," Reuters, 14 March 2017, accessed 12 February 2018.

<https://www.reuters.com/article/qatar-poland-lng/update-2-qatargas-agrees-to-double-lng-supplies-to-poland-idUSL5N1GR30N>

¹⁹¹ "Qatar Announces Huge Rise in Gas Production Amid Diplomatic Crisis," CNBC, 4 July 2017, accessed 12 February 2018.

<https://www.cnbc.com/2017/07/04/qatar-ratchets-up-gas-production-30-percent-despite-sanctions.html>

reliable LNG partner.¹⁹² Finally, the African nations of Nigeria, Angola, Cameroon, Algeria, Equatorial Guinea, and Egypt all export natural gas, demonstrating Africa's growing role in the LNG market¹⁹³, while Mozambique plans to start exporting LNG by 2020.¹⁹⁴ Despite this wealth of alternative LNG sources, the main concern within the BSR is the lack of LNG terminals where the countries can accept piped gas. This leaves countries in the BSR vulnerable to Russian pressure via their hold on the natural gas market.

Improving LNG in the BSR

Build More Infrastructure for LNG

The BSR should take advantage of the opportunities LNG provides for increased diversification of energy sources. Building more LNG terminals, such as the one currently planned in Brunsbuettel, near Hamburg, is one way to decrease reliance on Russian oil and gas. The plant costs about €487 million and will be up and running by the end of 2022.¹⁹⁵ When this plant is completed, it will supply 5 bcm of LNG per year, replacing about 10% of annual German natural gas imports from Russia.¹⁹⁶ Additionally, a study by the European Commission found that the Gulf of Finland would be the best place to build a regional LNG terminal for the Baltic Republics, increasing the region's LNG import capacity by 500 mcm per year (with plans to increase this capacity to 4 bcm per year).¹⁹⁷ While the port of Muuga near Tallinn, Estonia was selected as the terminal's location, the initiative has been waylaid by regional politics. The Lithuanian government has said that its Klaipeda terminal is the only economically viable terminal in the region,¹⁹⁸ and is unwilling to support the Estonian LNG hub.¹⁹⁹ However, the Klaipeda terminal can only supply about half of the Baltic Republics and Finland's energy needs.²⁰⁰ Similarly, the Latvian government has also not approved the plan for a regional LNG

Projects of Common Interest (PCIs)

Key infrastructure projects, especially cross-border projects, which link the energy systems of EU countries. To become a PCI a project must:

- Have a significant impact on at least two EU countries
- Enhance market integration and contribute to the integration of EU countries' networks
- Increase competition on energy markets by offering alternatives to consumers
- Enhance security of supply
- Contribute to the EU's energy and climate goals.
- Facilitate the integration of an increasing share of energy from variable renewable energy sources

¹⁹² Rascouet, Angelina, and Anna Shirevskaya. "New Africa Gas Comes at the Right Time for Europe." Bloomberg, 15 December 2017, accessed 12 February 2018. <https://www.bloomberg.com/news/articles/2017-12-15/new-africa-gas-comes-at-right-time-for-europe-amid-supply-woes>

¹⁹³ England, Andrew, "Mozambique Strives to Get Liquefied Natural Gas Projects Online." *Financial Times*, accessed 12 February 2018. <https://www.ft.com/content/27c165a6-91d3-11e5-bd82-c1fb87bef7af>

¹⁹⁴ Kiernan, Peter "Europe's Oil Import Dilemma" *The Fuse* Accessed 6 February 2018.

¹⁹⁵ Shiryavskaya and Parkin "German LNG Terminal" Accessed 23 January 2018.

¹⁹⁶ Shiryavskaya and Parkin "German LNG Terminal" Accessed 23 January 2018.

¹⁹⁷ "Terminal" TallinnLNG, accessed 22 February 2018. <http://www.tallinnlng.com/documents/>

¹⁹⁸ "Vopak: Regional LNG Terminal Should be Built in Muuga," Tallinn LNG, accessed 30 January 2018. <http://www.tallinnlng.com/vopak-regional-lng-terminal-should-be-built-at-muuga/>

¹⁹⁹ Seputyte, Milda. "Lithuania Grabs LNG in Effort to Curb Russian Dominance," Bloomberg Businessweek, October 27, 2014, accessed 22 February 2018. <https://web.archive.org/web/20141027171638/http://www.businessweek.com/news/2014-10-27/lithuania-grabs-lng-in-effort-to-curb-russian-dominance>

²⁰⁰ Mae, Andres. "Liquified Natural Gas Terminals for the Eastern Baltic," Geopolitika, accessed 22 February 2018. <http://www.geopolitika.lt/?artc=6077>

terminal and market, so the project has been excluded from the list of Projects of Common Interest (PCI),²⁰¹ preventing EU funding for the initiative.

To obtain EU funding for the Muuga terminal, the Baltic Republics have to reach an agreement regarding a regional natural gas market and terminal.²⁰² Germany should facilitate this process by using its influence to lobby Latvia to support the agreement. For the Brunsbuettel project to be commercially viable, the German government would need to make a long-term commitment to natural gas.²⁰³

Commercially speaking, adding more producers to a market increases competition, which is better for the consumer. Ending the current Russian natural gas monopoly increases competition, as currently seen with natural gas market in Lithuania. Before the building of the Klaipeda terminal, Russia had a complete monopoly on Lithuania's natural gas market, and as a result Lithuania paid the highest price for Russian gas of any nation in Europe.²⁰⁴ After the terminal was built, Lithuania was able to negotiate a 23% price cut from Gazprom.²⁰⁵ New terminals would allow other states in the BSR, including Germany, to decrease their dependence on Russian natural gas while receiving similar price cuts. The savings would then be passed down to the consumers, making electricity and heat cheaper, while also potentially offsetting the cost of importing LNG from other sources. On the other hand, governments should be careful not to build too many terminals, which would oversaturate the market.

From a public relations standpoint, Germany stands to benefit from supporting the Muuga terminal. Many of the other countries in the BSR fear that the opening of Nord Stream 2 would jeopardize their energy and economic security, as well as threatening European unity.²⁰⁶ These beliefs create a negative perception of Germany, as it gives the impression that Germany does not care about other countries' energy security and does not prioritize the Energy Union. By advocating for the Muuga terminal and ensuring that it receives funding, Germany can help counteract this perception. This would demonstrate that Germany is willing to promote the energy security of other countries, and believes in multilateral collaboration throughout the EU.

Internal Natural Gas Infrastructure

In addition to infrastructure originating from Russia, a lack of interconnectors and reverse flows (i.e. pipes capable of carrying gas East-West and West-East) in the region have limited the capacity for European states to respond collectively to crises in the natural gas sector.²⁰⁷ Initial steps to remedy this situation have been undertaken by the respective member states and the EU as a whole, yet there is significant room for improvement. The two projects of greatest significance in the BSR in regards to natural gas are the Balticconnector (Finland-Estonia) and

²⁰¹ "Estonia: Baltics' LNG terminal projects will not receive Europe's support" *The Baltic Course* | Baltic States news & analytics, accessed 30 January 2018. <http://www.baltic-course.com/eng/energy/?doc=133156>

²⁰² "Estonia: Baltics' LNG terminal projects will not receive Europe's support" *The Baltic Course* | Baltic States news & analytics, accessed 30 January 2018.

²⁰³ Shiryayevskaya and Parkin "German LNG Terminal" Accessed 1/23/18

²⁰⁴ Shiryayevskaya and Parkin "German LNG Terminal" Accessed 1/23/18

²⁰⁵ Shiryayevskaya and Parkin "German LNG Terminal" Accessed 1/23/18

²⁰⁶ Szymański, Konrad. "Nord Stream 2 is a test of European unity," *The Financial Times*, Ministry of Foreign Affairs Republic of Poland, accessed 30 January 2018.

http://www.msz.gov.pl/en/news/they_wrote_about_us/konrad_szymanski_for_the_financial_times__nord_stream_2_is_a_test_of_european_unit_y?channel=www

²⁰⁷ Bryza, Matthew J. & Tuohy, Emmet C., "Connecting the Baltic States to Europe's Gas Market," *Tallinn: International Center for Defense Studies Report*, March 2013.

the Gas Interconnection Poland Lithuania (GIPL). These projects are projected to be completed by 2019 and 2021 respectively. However, even with these projects complete, dependence on Russian gas and susceptibility to shortages in the winter months are of great concern.

Natural Gas Storage Capacity

Gas is imported at the same rate year round, despite far higher demand during the winter months. For this reason, storing gas becomes vital during the summer months to ensure that European stores can sustain populations during harsh northern winters. Beyond accommodating seasonal needs, gas storage is vital in a geopolitical sense, as reliance on Russian natural gas in the Baltic Republics brings about several security concerns. As mentioned above, Russia's use of 'pipeline politics' to intimidate Estonia, Latvia, and Lithuania is of great concern to the region. Additionally, periodic shutdowns and winter-induced increases of natural gas demands in Northwestern Russia around the Saint Petersburg area have created shortages in the Baltic energy networks in the past.²⁰⁸ For these reasons, the EU recognizes the importance of increasing storage capacity in the Baltics. Currently there is only one storage facility in the Baltic Republics, located in Incukalns, Latvia. The Incukalns storage facility can hold a total of 2.3 bcm of natural gas, which is enough to supply Latvia for two years if there was a termination of gas supplies from Russia.²⁰⁹ However, the Incukalns storage facility is also responsible for supplying gas to Latvia, Estonia, and Northwestern Russia during winter.²¹⁰ According to Latvijas Gaze, the gas company that controls the Incukalns storage facility, Latvia in 2015 could store 1.05 bcm of gas for itself, 450 million cubic meters (mcm) for Estonia, 100 mcm for Lithuania, and 800 mcm of gas for the northwestern region of Russia.²¹¹

German gas storage capacity is the highest in the EU, holding 23.8 bcm amongst 51 storage sites, in contrast to the Baltic energy "islands".²¹² When at full capacity, German natural gas stores can fuel the country for 80 days during a full gas cut off. In addition to high German storage capacity, the completion of Nord Stream 2 will add an additional 55 bcm in available gas capacity annually,²¹³ making Germany both a storage and supply hub for natural gas. Poland consumes around 15 bcm of gas a year, of which it imports 10.2 bcm from Gazprom, Russia's largest natural gas exporting company.²¹⁴ Poland currently has 8 gas storage facilities that can store 2,928.65²¹⁵ mcm of gas, enough for 30 to 50 days,²¹⁶ with a 9th storage facility planned to be operational by 2021.²¹⁷

²⁰⁸ "Latvia Plans to Boost Gas Storage Capacity to 2.8 Bcm by 2025," Reuters, 3 Oct. 2014. www.reuters.com/article/latvia-gas/latvia-plans-to-boost-gas-storage-capacity-to-2-8-bcm-by-2025-idUSL6N0RY2TE20141003.

²⁰⁹ Reuters, "Latvia Plans to Boost Gas Storage Capacity to 2.8 Bcm by 2025."

²¹⁰ Reuters, "Latvia Plans to Boost Gas Storage Capacity to 2.8 Bcm by 2025."

²¹¹ Reuters, "Latvia Plans to Boost Gas Storage Capacity to 2.8 Bcm by 2025."

²¹² Federal Republic of Germany, Federal Ministry for Economic Affairs and Energy, *Key factors for a secure energy supply*, accessed 30 January 2018. <http://www.bmwi.de/Redaktion/EN/Dossier/conventional-energy-sources.html>

²¹³ "Nord Stream 2." Gazprom. Accessed January 30, 2018. <http://www.gazprom.com/about/production/projects/pipelines/built/nord-stream2/>

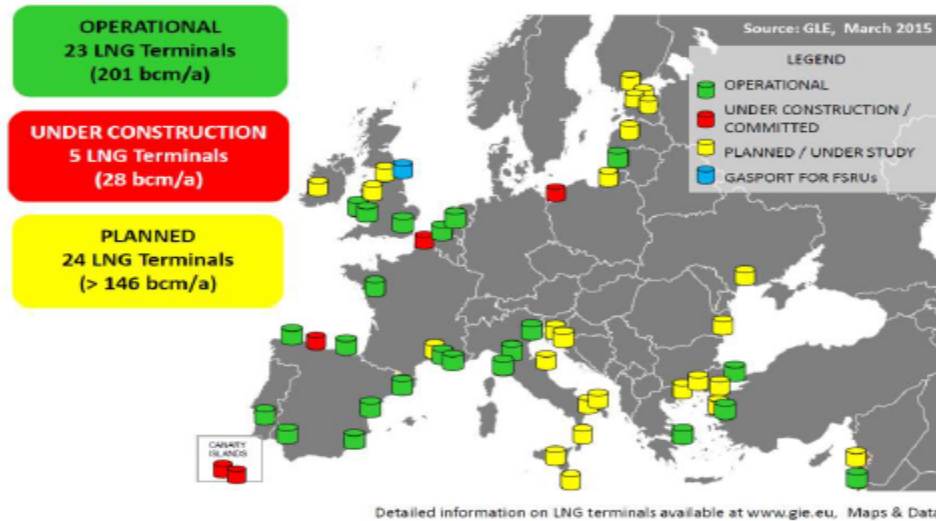
²¹⁴ Barteczko, Agnieszka and Koper, Anna. "Poland aims to end long-term gas supplies from Russia after 2022," *Reuters*, May 31, 2016, accessed 30 January 2018. <https://uk.reuters.com/article/us-eeurope-summit/poland-aims-to-end-long-term-gas-supplies-from-russia-after-2022-idUKKCN0YM2QJ>

²¹⁵ "Reports - Energy Regulatory Office," September 2017, accessed 30 January 2018. <https://www.ure.gov.pl/en/about-us/reports/67,Reports.html>

²¹⁶ Mordwa, Maria. "The Obligation of Strategic Gas Storage Introduced in Poland as an Example of a Public Service Obligation Relating to Supply Security: A Question of Compliance with European Law." *Year Book of Anti Trust and Regulatory Studies*, Vol. 2011, 4(4). https://www.yars.wz.uw.edu.pl/yars2011_4_4/Mordwa_The_Obligation_of_Strategic_Gas.pdf

²¹⁷ "Annual Report 2012," *Trade and Storage – Part 2*, accessed 30 January 2018. <http://pgnig.pl/reports/annualreport2012/en/ar-obrot-magazynowanie-2.html>

Current Status



Source: GLE website

Source: Energy Routes

There are plans to increase Incukalns capacity to 2.8 bcm by 2020. However, in the event of a Russian shut off or a prolonged break in a supply line, this would still not be enough to secure supply to all three Baltic Republics, Northwest Russia, and eventually Finland, which has no gas storage capacity. Poland is also currently enhancing its gas storage capacity at two sites, Damasławek and Mogilno²¹⁸, which will further decrease Poland's energy dependence vis-à-vis Russia. Mogilno's current capacity is being expanded to 800 m³, while the Damasławek site's expansion is still in the exploratory phase.²¹⁹

Needed Improvements in Infrastructure

Increased funding for the Incukalns expansion should be made available to Latvia to enhance natural gas storage capacity in the BSR. This is in line with European Commission's (EC) Baltic Energy Market Interconnection Plan (BEMIP).²²⁰ With increased storage capacity, and enhanced interconnections to Estonia and Lithuania, the Baltic Republics will be one step closer to ending their energy isolation and dependence on Russia.

Storage capacity is also an important issue in creating a gas trading hub in the BSR. The lack of gas hubs in the eastern BSR is an impediment to lowering the price of natural gas, and reducing the region's dependence on Russia, compounded by a lack of storage in that region. There is an absence of sufficient storage capacity near trading hubs, and spot-market pricing disappears during the winter, leaving the hub's liquidity highly restricted and undermining the above stated goals.²²¹ Germany and Poland should pursue initiatives aimed at enhancing storage capacity in order to best utilize increased gas capacity in Eastern Germany due to Nord Stream II. Two gas storage facilities in Daszewo, Poland and Möckow, Germany are within close proximity to each

²¹⁸ "CSE Storage Map 2015." *Gas Infrastructure Europe*.

http://www.gie.eu/download/maps/2015/GIE_STOR_2015_A0_1189x841_FULL_wINFOGRAPHICS_FINAL.pdf

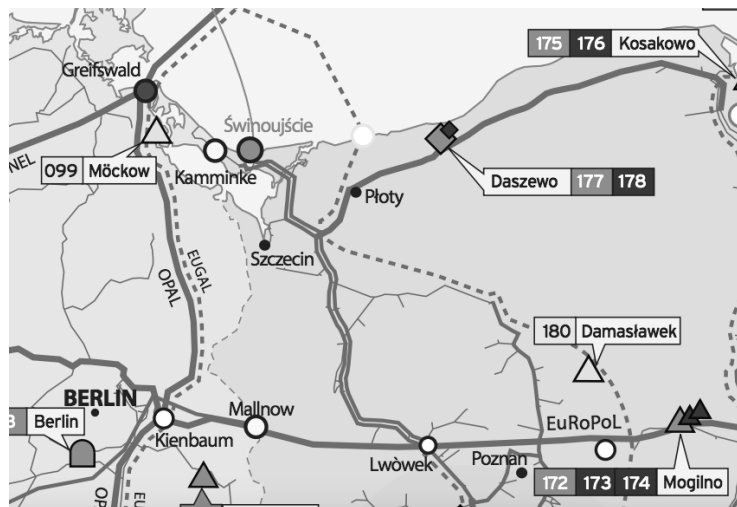
²¹⁹ "Annual Report 2012," *Trade and Storage – Part 2*, accessed 30 January 2018.

²²⁰ "Baltic Energy Market Interconnection Plan - Energy - European Commission," *Energy*, January 26, 2018, accessed 31 January 31.

<https://ec.europa.eu/energy/en/topics/infrastructure/baltic-energy-market-interconnection-plan>

²²¹ J. Bryza and Tuohy, "Connecting the Baltic States to Europe's Gas Market"

other, opening up the possibility for a Polish German interconnector at Kamminke. This could then connect to the Świnoujście, Poland LNG terminal, and would thus be the perfect site for bilateral investment. With a commitment to expand the storage potential on both sites and a bilateral investment for an interconnector at Kamminke, Germany and Poland could create a joint natural gas hub that would help drive down prices and diversify energy supplies by increasing the capacity of various imported gas to be stored over longer periods of time. Funding for these projects would come bilaterally from Poland and Germany, but the EU could also designate these proposals as PCIs, thereby opening the projects to possible EU funding. Increasing the capacity for gas storage is also in line with the 2014-15 European Energy Security



Strategy which emphasize increased storage capacity and improvements in reverse flows.²²²

Furthermore, creating a regional gas storage stockpiling agency, similar in mission to that of the German National Petroleum Stockpiling Agency, will ensure strategic energy security amongst regional members. A regional stockpiling body will need to be a public body with compulsory membership for domestic producers and importers. In principle, the task of building up a strategic reserve could be

entrusted to the public body. The joint stockpiling agency would be responsible for ensuring gas supplies equaling 90 days of consumption, in line with the German National Petroleum Stockpiling Agency which requires 90 days of petroleum in storage capacity.²²³

Oil in the Baltic Sea Region

Europe also heavily relies on Russian oil as an energy source, with 30% of EU crude oil imports coming from Russia in 2015, and some countries such as Poland relying on Russia for over 90% of their crude oil imports.²²⁴ Relying on Russian oil presents many of the same problems as natural gas, with Russia proving itself willing to use oil as a tool to achieve its geopolitical goals. Additionally, the quality of Russian oil exported to Europe has recently been decreasing. Russia has been increasing their oil shipments to China and sending high-quality oil there, while sending lower-quality oil (which is oil that has a high sulphur content) to Europe,²²⁵ making it harder for European companies to refine the oil, and raising questions about Russia's dependability as an oil supplier.²²⁶

²²² "Communication from the Commission to the European Parliament and the Council. European Energy Security Strategy" *EUR-Lex*, 28 May 2014. <http://eur-lex.europa.eu/legal-content/EN/TXT/HTML/?uri=CELEX:52014DC0330&from=EN>

²²³ "Erdölbevorratungsverband." EBV Erdölbevorratungsverband. Accessed February 02, 2018. https://www.ebv-oil.org/cmse/pdf/ebv_information_brochure_esa.pdf.

²²⁴ "A Study on Oil Dependency in the EU," *Cambridge Economics*, accessed 14 February 2018 https://www.camecon.com/wp-content/uploads/2016/11/Study-on-EU-oil-dependency-v1.4_Final.pdf

²²⁵ "Europe Shuns Russian Oil as Boost of Chinese Flow Hits Quality" *Reuters*, accessed 6 February 2018.

<https://www.reuters.com/article/russia-oil-urals-quality/europe-shuns-russian-oil-as-boost-of-chinese-flows-hits-quality-idUSL8N1PS0KH>

²²⁶ Brown, Stephen and Mine Yucel, "The Shale Gas and Tight Oil Boom: U.S. States' Economic Gains and Vulnerabilities," *Council on Foreign Relations* (2015).

Current Oil Policies and Gaps

Europe is working to reduce its usage of oil as a whole by improving vehicle fuel efficiency, promoting electric cars, and increasing the production of renewable fuels.²²⁷ Simultaneously, Europe is attempting to reduce its dependence on foreign oil with some countries, most notably Poland, attempting to increase domestic shale oil production.²²⁸ Unfortunately, none of these policies have reduced Europe’s dependence on imported oil, and from 2000 to 2014 the total amount of foreign oil consumption actually increased by 12%.²²⁹ Fortunately, several states in the BSR have lowered their dependence on Russian oil imports, such as Lithuania, which went from importing 100% of its crude oil from Russia in 2012 to importing 85% in 2016.²³⁰ Yet even nations which have lowered their dependence on Russian oil by finding alternative suppliers still depend on Russia for the majority of their oil imports.

Diversify Oil Supplies

The BSR should continue to move away from using oil, both for environmental reasons and because it makes the BSR dependent on oil-exporting nations. Currently, the EU’s plan for reducing non-renewable energy still has oil being used in 2050, although by that point it will mainly be used for long-distance transport.²³¹ As such, the BSR should find other sources of oil so as to move away from dependence on Russia. One source is the Middle East, particularly Saudi Arabia. Within the past two years, Saudi Arabia has stepped into the Polish oil market, signing an agreement with Polish refineries to supply 50,000 barrels of oil per day.²³² Another source of oil is Iran, which in 2016 was Poland’s choice to help replace Russian crude oil.²³³ A final option for importing oil is from the US, as the same shale revolution that has made the US a major gas exporter is also allowing them to export oil, further aided by the 2016 Obama-era lift of a ban on US oil exports.²³⁴

Percent of Crude Petroleum Imported From Russia			
Nation	2012	2016	Percent Change
Germany	33%	34%	1%

²²⁷ Neslen, Arthur. “The Rise and Fall of Fracking in Europe,” *The Guardian*, accessed 8 February 2018.

<https://www.theguardian.com/sustainable-business/2016/sep/29/fracking-shale-gas-europe-opposition-ban>

²²⁸ “A Study on Oil Dependency in the EU,” *Cambridge Economics*, accessed 14 February 2018

²²⁹ “A Study on Oil Dependency in the EU,” *Cambridge Economics*, accessed 14 February 2018

²³⁰ “Where Does Lithuania Import Crude Petroleum From?” *The Observatory of Economic Complexity*, accessed 12 February 2018.

https://atlas.media.mit.edu/en/visualize/tree_map/hs92/import/ltu/show/2709/2016/

²³¹ “Energy Roadmap 2050,” *European Commission*, 2012, accessed 8 February 2018.

https://ec.europa.eu/energy/sites/ener/files/documents/2012_energy_roadmap_2050_en_0.pdf

²³² “Saudi Aramco Enters Baltic Market with Oil Supply Deal with Polish PKN,” *Reuters*, June 1, 2016, accessed 8 February 2018.

<https://www.reuters.com/article/us-pkn-poland-aramco-int/saudi-aramco-enters-baltic-market-with-oil-supply-deal-with-polish-pkn-idUSKCN0YO02X>

²³³ “Exclusive: Oil Reshuffle in Poland: Urals Out, Iran In” *Reuters*, accessed 13 February 2018. <https://www.reuters.com/article/us-oil-urals-poland/exclusive-oil-reshuffle-in-poland-urals-out-iran-in-idUSKCN10N26U>

²³⁴ Gallucci, Maria. “Oil Markets: First Liquid American Freedom Tanker of Crude Arrives in Europe After Obama Lifts Export Ban,” *International Business Times*, accessed 13 February 2018. <http://www.ibtimes.com/oil-markets-first-liquid-american-freedom-tanker-crude-arrives-europe-after-obama-2272493>

Poland	93%	80%	-13%
Lithuania	100%	85%	-15%
Latvia	0%	0%	0%
Estonia	18%	100%	82%
Finland	82%	87%	5%
Sweden	39%	40%	1%
Denmark	6.1%	17%	10.9%

Source: Observatory of Economic Complexity

Diversify Oil Supplies

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Diversifying oil sources has many of the same benefits as diversifying natural gas sources, including increased energy security and the ability to better negotiate with Russia for lower prices. Alternative oil sources could help convince the Russians to improve the quality of oil they send to the BSR, as Russia would need to improve the quality of their oil exports or see a drop in their market share. Alternatively, if Russia decides not to improve the quality of the oil they export to the BSR, having several different suppliers of oil will allow countries in the region to be independent of lower-quality imports.

²³⁵ "Energy Roadmap 2050," *European Commission*, 2012, accessed 8 February 2018.

https://ec.europa.eu/energy/sites/ener/files/documents/2012_energy_roadmap_2050_en_0.pdf

²³⁶ "Saudi Aramco Enters Baltic Market with Oil Supply Deal with Polish PKN," *Reuters*, June 1, 2016, accessed 8 February 2018.

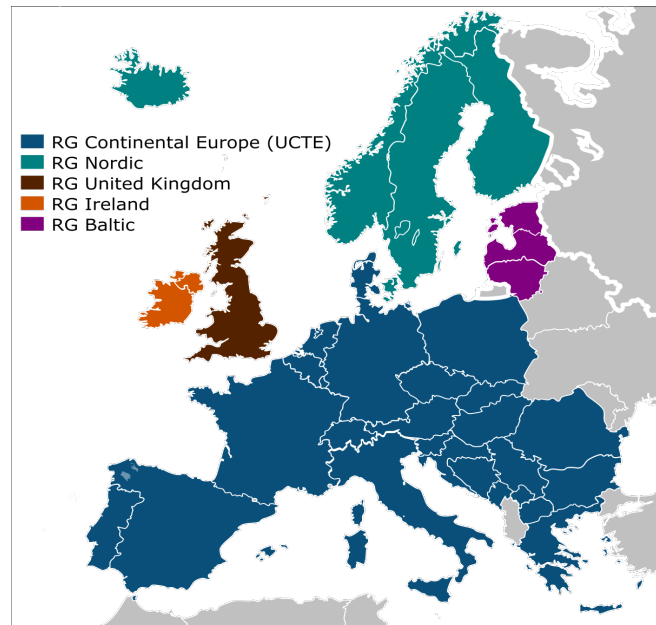
<https://www.reuters.com/article/us-pkn-poland-aramco-int/saudi-aramco-enters-baltic-market-with-oil-supply-deal-with-polish-pkn-idUSKCN0YO02X>

²³⁷ "Exclusive: Oil Reshuffle in Poland: Urals Out, Iran In" *Reuters*, accessed 13 February 2018. <https://www.reuters.com/article/us-oil-urals-poland/exclusive-oil-reshuffle-in-poland-urals-out-iran-in-idUSKCN10N26U>

²³⁸ Gallucci, Maria. "Oil Markets: First Liquid American Freedom Tanker of Crude Arrives in Europe After Obama Lifts Export Ban," *International Business Times*, accessed 13 February 2018. <http://www.ibtimes.com/oil-markets-first-liquid-american-freedom-tanker-crude-arrives-europe-after-obama-2272493>

Electricity Infrastructure in the Baltic Sea Region

The Baltic Republics historically have been a part of the Integrated Power System/Unified Power System (IPS/UPS) which synchronized the electrical grids of the former Soviet Republics and satellite states.²³⁹ The Continental EU has a similarly designed grid, and with the enlargement of the EU eastwards, the European Synchronised Grid has expanded to 22 countries including almost all EU members, minus the Baltic Republics and Nordic States. Denmark's western regions are the exception, as they use the continental grid while its eastern islands use the Nordic grid.²⁴⁰ Baltic electricity grids are vulnerable to Russian disruptions in two critical ways: they rely heavily on Russian electricity imports, and they also share the same electricity grid as Russia. Lithuania, for example, imports nearly half of its electricity from Russia and Belarus since it closed its nuclear power plant at Ignalina in 2009.²⁴¹ Because the Baltic Republics are on the IPS/UPS grid, "the frequency at which electricity flows, the voltage of the lines and the balance of the grid...[are] different from that used by the EU countries in Central Europe,"²⁴² which further complicates Baltic efforts to connect to the Continental Grid. In response to these challenges the Baltic Republics should set up further transfer capabilities in order to import electricity from the West.



When analyzing the Baltic Republics' electricity grid, Russian interests cannot be ignored. Baltic energy interconnections are in some ways more contentious for Russia than gas independence, primarily due to the Kremlin's concern over the Russian enclave of Kaliningrad. Russia fears that if the Baltic Republics become synchronous with the Continental Grid, it will make Kaliningrad dependent on the EU for electricity, and that Russia will lose much of its leverage in the region. Russia also fears that it will have to create new infrastructure to offset this loss. Russian displeasure at these overtures is evidenced by Russian ships repeatedly harassing Swedish and Lithuanian vessels building NordBalt, the undersea electric cable connecting Sweden to Lithuania.²⁴³

²³⁹ "PCI Factsheet Baltic synchronisation." European Commission, January 26, 2018, accessed 31 January 2018. <https://ec.europa.eu/energy/en/topics/infrastructure/projects-common-interest>

²⁴⁰ "European network of transmission system operators for electricity," *Regional Groups*, accessed 31 January 2018. <https://www.entsoe.eu/about-entso-e/system-operations/regional-groups/Pages/default.aspx>

²⁴¹ Hoellerbauer, Simon. "Lithuania Moves to Bolster Electricity Security," Foreign Policy Research Institute, March 23, 2016, accessed 1 February 2018. <https://www.fpri.org/article/2016/03/lithuania-moves-bolster-electricity-security/>

²⁴² Hoellerbauer, Simon. "Lithuania Moves to Bolster Electricity Security," Foreign Policy Research Institute, March 23, 2016, accessed 1 February 2018.

²⁴³ Hoellerbauer, Simon. "Lithuania Moves to Bolster Electricity Security," Foreign Policy Research Institute, March 23, 2016, accessed 1 February 2018.

The challenges facing the electricity grid in Poland and Germany differ from those in the Baltic Republics. Following the collapse of the Soviet Union, West German electricity infrastructure expanded quickly into former East Germany and greater interconnection and synchronization were prioritized for the Eastern EU member states. The problem now facing the German electricity grid is that of “loop flows.” “Loop flows” refers to when a country's power grid is overburdened by a surplus in electricity, and the country uses neighboring countries grids to export electricity and then imports that same electricity to another area of the original country.²⁴⁴ For Germany, this occurs when abundant wind energy is produced in the northern Länder, and has to be routed through Poland and the Czechia to reach the southern Länder.²⁴⁵ Conventional power plants are carefully designed to ensure the most efficient production and transmission of the produced power. However, renewable energy production is often limited by its source - nature; “sustainable energy generation like hydro, wind, sun, and waves are normally not located close to the consumption. This fact makes the transmission of the power almost as essential as the production.”²⁴⁶ Due to the uneven distribution of power resulting from renewable energy sources, a greater emphasis must be placed on interconnection.

Electricity Infrastructure in the 21st Century

The Baltic Republics have taken steps since the EU Third Energy Package to diversify their electric grids. Lithuania has completed LitPol (Lithuania-Poland) and NordBalt (Sweden-Lithuania) which have partially connected the Lithuanian grid to both the Continental European Grid and the Nordic Grid. NordBalt has a capacity of 700 megawatts (MW), while LitPol currently has a capacity of 500 MW with plans to extend the capacity to 1000 MW by 2020.²⁴⁷ Estonia has completed Estlink 1 & 2 which connects Estonia to Finland and has a combined capacity of 1000 MW. The largest beneficiary of these moves has been Lithuania, as two of the three above mentioned electricity lines run through the country. During “peak time” Lithuania,



as of 2013, consumes 1810 MW a day,²⁴⁸ meaning that both LitPol and NordBalt account for more than half of Lithuanian energy supplies. By February 2016 Lithuania imported 69% of its electricity from Nordic countries.²⁴⁹ However, in order to become synchronous with the Continental or Nordic grids, the Baltic Republics must undertake more expensive infrastructure projects in response to the different frequency of electricity flow between the IPS/UPS grid and the Continental and Nordic grids.

²⁴⁴ “Energy Policies of IEA Countries - Poland 2016 Review” *Publication: Energy Policies of IEA Countries - Poland 2016 Review*, accessed 7 February 2018. https://www.iea.org/publications/freepublications/publication/Energy_Policies_of_IEA_Countries_Poland_2016_Review.pdf

²⁴⁵ “Energy Policies of IEA Countries - Poland 2016 Review” *Publication: Energy Policies of IEA Countries - Poland 2016 Review*, accessed 7 February 2018.

²⁴⁶ Gunnar, Asplund. “Sustainable energy systems with HVDC transmission,” Power Engineering Society General Meeting (2004), 1. <http://ieeexplore.ieee.org/xpl/mostRecentIssue.jsp?punumber=9451>

²⁴⁷ Hoellerbauer, “Lithuania Moves to Bolster Electricity Security.” Foreign Policy Research Institute.

²⁴⁸ Hoellerbauer, “Lithuania Moves to Bolster Electricity Security.” Foreign Policy Research Institute.

²⁴⁹ Hoellerbauer, “Lithuania Moves to Bolster Electricity Security.” Foreign Policy Research Institute.

Due to excess wind electricity, Germany is facing sporadic surpluses that are wasting energy and causing strain on Poland's electricity grids - a stark contrast to the current electricity situation in the Baltic Republics. German clean energy production, particularly wind energy along Germany's Baltic Coast, has resulted in large surpluses of electricity. This is evidenced by the fact that on Christmas day 2017, German electric companies paid customers to use electricity due to the surplus.²⁵⁰ These large surpluses then must be routed through Poland in order to reach Southern Germany. However, these surpluses have a negative effect on the Polish power grid because for, "every 100 MW of unplanned power flows [it] reduces available interconnector capacity by 200 MW."²⁵¹ In order to best utilize German renewable energy, greater investment in interconnection must be prioritized.

Needed Improvements for the Baltic Sea Region's Electricity Infrastructure

The optimal solution for the Baltic Republics is to synchronize their electricity grids with the Continental Grid. However, due to a lack of agreement on the synchronization process and division of duties with Poland,²⁵² the priority should be better interconnection and electric storage capacity.

Recent investments in storage facilities have bolstered the electricity produced in the Baltic Republics greatly. Pumped hydroelectric storage (PHES) facilities are one way to address renewable energy systems' shortcomings. PHES facilities work by pumping water from a lower reservoir into to a higher reservoir during times of low demand. During peak times, the facility drains water into the lower reservoir to offset the burden of peak consumption. Currently there is only one operational hydro-pumped electricity storage facility in the Baltic Republics, located in Kruonis, Lithuania, capable of ensuring 94% of the daily electricity reserves for Lithuania in case of an emergency.²⁵³ However, the new Estonian PHES facility will become the second such facility in June 2018, possessing an electric capacity of 500 MW²⁵⁴ which would be enough to cover the Estonian daily peak load of 1800 MW.²⁵⁵ To best utilize these two facilities, as well as the recently added LitPol, NordLit, and Estlink I and II, the Baltic Republics must prioritise interconnection.

Because Latvia is a net exporter of electricity in the BSR,²⁵⁶ the focus should be on greater interconnection between Kilingi-Nõmme, Estonia, and Riga combined heat and power (CHP) 2 substation, Latvia. The Kilingi-Nõmme and Riga CHP2 substation would increase 500/600 MW

²⁵⁰ Reed, Stanley. "Power Prices Go Negative in Germany, a Positive for Energy Users," The New York Times, December 25, 2017, accessed 7 February 2018. <https://www.nytimes.com/2017/12/25/business/energy-environment/germany-electricity-negative-prices.html>

²⁵¹ "Energy Policies of IEA Countries - Poland 2016 Review" *Publication: Energy Policies of IEA Countries - Poland 2016 Review*, accessed 7 February 2018.

²⁵² "Elering: Baltic Power Grid's Autonomous Capacity Should Be Strengthened." Edited by Aili Vahtla, *ERR*, 20 Sept. 2017, news.err.ee/619656/elering-baltic-power-grid-s-autonomous-capacity-should-be-strengthened

²⁵³ "Kruonis Pumped Storage Hydroelectric Plant (the KPSHP)," Lietuvos Energija, accessed 5 February 2018. <https://gamyba.le.lt/en/activities/electricity-generation/kruonis-pumped-storage-hydroelectric-plant-kpsHP>

²⁵⁴ "PCI hydro pumped storage in Estonia (Estonian PHES)," European Commission, Investment Project EIPP-20160232, accessed 5 February 2018. <https://ec.europa.eu/eipp/desktop/en/projects/project-247.html>

²⁵⁵ "Hydro Pump Storage Plant in Estonia." *EnergiaSalv*, Feb. 2011, energiasalv.ee/wp-content/uploads/2012/07/US-embassy-meeting-080211.pdf

²⁵⁶ Purvins Arturs, Gianluca Fulli, Catalin-Felix Covrig, and Aymen Chaouachi et al., "The Baltic Power System between East and West Interconnections," European Commission, JRC Science for Policy Report, 2016.

http://publications.jrc.ec.europa.eu/repository/bitstream/JRC100528/reqno_jrc100528_pdf.pdfhttp://publications.jrc.ec.europa.eu/repository/bitstream/JRC100528/reqno_jrc100528_pdf.pdf

of electricity in both directions once operational.²⁵⁷ This would bolster existing capacities and better interconnect the three Baltic Republics. This interconnection is slated as a PCI which would allow Germany, the EU, and the Baltic Republics to work together closely in bolstering electricity security in the region.

In regards to improving interconnection between Poland and Germany, increased funding should be allocated to the German Polish power bridge (GerPol). These projects are focused on the construction of new power lines between Mikułowa - Świebodzice, Krajnik - Baczyna and Baczyna - Plewiska in Poland. These projects are slated to be completed in 2021, 2021, and 2020 respectively - although this project has been delayed due to investment needs.²⁵⁸ Further investment could come from the European Fund for Strategic Investments, which focuses on, in part, energy efficiency.²⁵⁹ Completion of GerPol would serve two strategic goals. Firstly, increasing the capacity of electricity interconnection with Poland will allow for higher volumes of German electricity to regularly be made available in Central Eastern Europe and the BSR. Secondly, this increased capacity will create a more viable market for German clean energy in Poland, which gets 81% of its electricity from burning coal as of 2015.²⁶⁰ By increasing interconnection with Poland, Germany is able to reduce “loop flows” while also providing cheap clean renewables to western Poland.



Renewable Energy

One of the greatest challenges of the 21st century is the contrast between increasing energy demand and the slow and expensive development of renewable, sustainable energy resources. Historically, the Baltic Republics have depended on foreign coal and natural gas imports, relying especially on Russian energy imports, as noted above. To avoid a complete dependence on foreign energy supplies, as energy demands increase, many countries in the BSR have sought to identify other indigenous energy resources. Some early examples include Sweden’s attempt at utilizing hydropower and timber waste, and Finland’s attempt to increase the production of peat (an accumulation of partially decayed vegetation or organic matter) and firewood in the early

²⁵⁷ “Latvian-Estonian 3rd interconnection,” Latvian-Estonian- 3 rd,” accessed 5 February 2018.

http://www.latvenergo.lv/portal/page/portal/english/LET/LET/about_network/Latvian-Estonian-3rd/

²⁵⁸ “Project 230 - GerPol Power Bridge I.” European network of transmission system operators for electricity, 2016.

<https://www.entsoe.eu/Documents/TYNDP%20documents/TYNDP%202016/projects/P0230.pdf>

²⁵⁹ “The European Fund for Strategic Investments (EFSI),” European Commission, 25 January 2018, ec.europa.eu/commission/priorities/jobs-growth-and-investment/investment-plan-europe-juncker-plan/european-fund-strategic-investments-efsi_en

Military Doctrine of the Russian Federation, approved by Russian Federation presidential edict on February 5, 2010 (translated). Accessed at http://carnegieendowment.org/files/2010russia_military_doctrine.pdf.

²⁶⁰ “Energy Policies of IEA Countries - Poland 2016 Review” *Publication: Energy Policies of IEA Countries - Poland 2016 Review*, accessed 7 February 2018.

1980s.²⁶¹ However, the threat of the exhaustion of non-renewable energy sources never completely disappeared. Thus, shifting from traditional energy sources into renewable energy is currently prioritized in many countries. By 1994, 49% of Finland's electricity came from nuclear and hydropower, 75% of Latvia's electricity came from hydropower, and 92% of Lithuania's electricity came from hydropower.²⁶² Upon the Baltic Republics' accession to the European Union in the early 2000s, establishing a renewable energy network that is cohesive, integrated, and interchangeable became one of the top EU priorities in these countries.

The EU's aspirations in energy efficiency are to promote the production of renewables, increase the market share of renewable energy, and to invest more in the development of energy efficient technologies within the EU. Their specific goals for reaching these aspirations are:

1. Reaching the target of renewable resources making up 20% of EU's total energy consumption by 2020, with each country having at least 10% of their transportation fuel coming from renewable sources, and increase the total energy consumption of renewables to at least 27% by 2030;
2. Promote the security of energy supply, energy savings, and increased energy efficiency, in order to create a safer and cleaner environment for all;
3. Promote technological innovations, provide employment and development, especially in previous isolated, rural areas.²⁶³

Supporting the growing interests of renewable energy within the EU also comes with formidable challenges. These challenges include the differences of geographic traits, which impact the availability and feasibility of the types of renewable energy. The best suited renewable energy options are often different for each country, and oftentimes it will require a combination of different energy sources to achieve the stated goals.

Current States and Challenges of Renewable Energy in the Baltic Region

The 20-20-20 Goal

The starting point for renewable energy of each country within the EU varies greatly, however most countries in the BSR are able to meet the EU-set 20% renewable energy goal. The highest share of renewables in the EU is in Sweden (53.9%), Finland (39.3%) and Latvia (37.6%).²⁶⁴ Estonia, Lithuania and Sweden, for example, have all set their renewable energy goals higher than 20% and are expecting a surplus by 2020. Germany and Poland both have a renewable energy goal lower than 20%, with Germany aiming for 18% and Poland at 15%. In 2016, Germany managed to achieve a percentage of 14.8% and Poland achieved 11.3%. Finland is on track to reach its goal of 38% renewable energy by 2020. Denmark is currently looking at a 2% deficit from its 30% goal, but is still able to reach the general goal of 20% renewable energy by 2020.²⁶⁵

²⁶¹ Ratnieks, Henry. "THE ENERGY CRISIS AND THE BALTICS." *Journal of Baltic Studies* 12, no. 3 (1981): 245-59. <http://www.jstor.org/stable/43211103>.

²⁶² Veiderma, Mihkel. "Common Baltic Energy Systems – A Precondition for Sustainable Development." *Energy Exploration & Exploitation* 14, no. 2 (1996): 127-32. <http://www.jstor.org/stable/43865168>.

²⁶³ "Directive 2009/28/EC of the European Parliament and of the Council of 23 April 2009 on the promotion of the use of energy from renewable sources and amending and subsequently" <http://eur-lex.europa.eu/legal-content/EN/TXT/HTML/?uri=CELEX:32009L0028&from=EN>

²⁶⁴ Eurostat, "Share of renewables in energy consumption in the EU still on the rise to almost 17% in 2015."

²⁶⁵ "Summary of the Member State Forecast Documents." European Commission. https://ec.europa.eu/energy/sites/ener/files/dir_2009_0028_article_4_3_forecast_by_ms_symmary.pdf

Unfortunately, current estimates indicate that it will take until 2040 to 2050 for Germany's energy transition to be completed.²⁶⁶ With the rapid phase out nuclear energy, alternative energy sources such as coal and electrical power grids will have to be used for countries that have high energy consumption rates. Both Germany and Poland rely heavily on coal as a power source, with 43.9% of German energy production, and 50.8% of Polish energy production, coming from coal. According to a report by Ecofys, at the best case scenario, Poland will only reach 13.8% of their energy supply with renewable sources, which are mainly provided by biomass and solar resources.²⁶⁷ Germany has been making efforts to reach its goal through its *Energiewende*. These efforts include shutting down some of the larger, older lignite plants by the early 2020s, and aiming to have Germany's last lignite-fueled plant close by 2050.²⁶⁸ Natural gas is a way to bridge the gap between the the transition away from traditional energy sources and renewables becoming the BSR's main source of energy. Natural gas produces about half as much carbon dioxide as coal, which means that switching from coal to natural gas will significantly cut down on the BSR's carbon emissions.²⁶⁹

Energy Safety

Following Japan's Fukuyama nuclear accident in 2011, nuclear safety has become a top priority for many EU countries, including Germany. In addition to the stress tests carried out in 2011 and 2012, the EU released a Nuclear Safety Directive in 2014, emphasizing that individual countries are responsible for the management of radioactive waste.²⁷⁰ This further strengthened many countries' determination to phase out nuclear power plants. Within the BSR, Sweden has 10 nuclear reactors, and has already decided to prevent further construction of new reactors; Germany has 8, and is actively engaged in the complete phase-out of nuclear energy power plants by 2022, in accordance with its *Energiewende*. Finland has four reactors, and ratified two new reactors in 2010; they are not planning on closing any of the existing reactors. There are two reactors in Lithuania, one that is closed and one that is in the planning stage of construction, while Denmark, Estonia, Latvia, and Poland have no operational nuclear power plants.²⁷¹ Nuclear energy, however, still plays an important role in many of these countries energy mixes. While Germany has decommissioned its nuclear power plants, and put a moratorium on building new plants, the construction of nuclear power plants in Lithuania, Belarus, and Poland presents challenges to nuclear safety.

In order to better enhance nuclear safety in the region Germany should pursue dialogue with Belarus through the Nuclear Safety Account (NSA). This organization was set up following the collapse of the Soviet Union with the goal of upgrading the safety and integrity of Soviet Nuclear reactors in Bulgaria, Lithuania, and Russia, and Ukraine. The organization offered financial incentives and infrastructure expertise in order to enhance security and upgrade outdated

²⁶⁶ Federal Republic of Germany, Federal Ministry for Economic Affairs and Energy, *The Energy of the Future*, November 2015.

https://www.bmwi.de/Redaktion/EN/Publikationen/vierter-monitoring-bericht-energie-der-zukunft-kurzfassung.pdf?__blob=publicationFile&v=1

²⁶⁷ Janeiro, Luis, and Gustav Resch, "2020 Renewable Energy Target Realisation Forecast for Poland," ECOFYS. <http://psew.pl/en/wp-content/uploads/sites/2/2017/04/2020-Renewable-Energy-Target-Realisation-Forecast-for-Poland.pdf>.

²⁶⁸ Schrader, Christopher. "CLIMATE POLICY. Can Germany Engineer a Coal Exit?" *Science* (New York, N.Y.) 351, no. 6272 (2016): 430-1.

²⁶⁹ Zielinski, Sarah. "Natural Gas Really Is Better Than Coal." *Smithsonian*, February 13, 2014, accessed 30 January 2018.

<https://www.smithsonianmag.com/science-nature/natural-gas-really-better-coal-180949739/>

²⁷⁰ Official Journal of the European Union, "Council Directive 2014/87/Euratom of 8 July 2014 amending Directive 2009/71/Euratom establishing a Community framework for the nuclear safety of nuclear installations," European Union, 8 July 2014. <http://eur-lex.europa.eu/legal-content/EN/TXT/HTML/?uri=CELEX:32014L0087&from=EN>

²⁷¹ European Commission, "Implementation status of Council Directive 2009/71/Euratom of 25 June 2009 establishing a Community framework for the nuclear safety of nuclear installations," *European Commission*, 2009. <http://eur-lex.europa.eu/legal-content/EN/TXT/HTML/?uri=CELEX:52015SC0244&from=EN>

facilities. Germany, through the framework of the EU, should propose that Belarus allow for stress tests and onsite inspections from representatives of the NSA. In return, the NSA could allocate a portion of its \$385 million budget to recommended safety improvements.²⁷² Though Germany has prioritized a pivot away from nuclear energy, sharing German and EU expertise on nuclear safety protocol would further nuclear safety in the BSR. Engaging with Belarus, and any other aspiring nuclear country in the BSR, would allow for Germany, Sweden, Finland, and other successful nuclear energy users to share information and resources in order to better promote safety.

Installation of Energy Efficiency Systems

Another project that the EU is highlighting is energy efficiency. The EU goals for energy efficiency are to cut energy consumption by 20% by 2020, and to increase energy saving by 30% by 2030. The benefits of implementing energy efficient measures include decreased energy bills, reduced reliance on foreign fossil fuels, increased innovation promotion, and greater environmental protections.²⁷³ From 2007 to 2014, the EU's energy consumption displayed a gradual decrease, though there was a slight increase in 2015 due to cooler weather and a reduction in energy prices. The future of energy efficiency relies heavily on the adoption of renewable energy over traditional fossil fuels. Data shows that over half of the EU's energy consumption is due to heating or cooling buildings, yet only 18% of this energy is produced by renewable sources.²⁷⁴ The heating and cooling strategy that was established by the European Commission thus suggested the integration between local electricity networks and heating and cooling systems. According to this plan, energy that has been leaked into the water and air near industrial sites can be utilized by linking these industrial areas with direct heating systems.²⁷⁵

The method of linking local electricity networks and heating and cooling systems was first utilized in Sweden and could be applied in the future to Germany and many other BSR countries. The concept behind district heating instructs societies to take advantage of energy sources such as fossil fuels, biomasses, and solar energy that produce heat, and to use them as ways to provide water and space heating for nearby neighborhoods. In practice, hot water in such a system can be transported between heating facilities and households at a designed average output temperature of 86 °C and at a return temperature of 47°C. Currently, there are about 500 district heating systems within Sweden employing industrial excess heat, combustion of biomass, and flue gas condensation.²⁷⁶ In Germany, the best way to utilize this method would be to convert current coal or thermal generators into CHP plants.²⁷⁷ CHP power plants produce both electricity and heat to increase the efficiency of heat processing upwards of 90%. This is a long term renewable energy source, that also improves the efficiency of fossil fuels, which are currently still irreplaceable. In the future, renewable energy sources such as biomass, renewable boilers, and recycled heat will gradually replace the current use of fossil fuels, and will hopefully become widely employed throughout the BSR.

²⁷² "Nuclear Safety Account." *European Bank for Reconstruction*. <http://www.ebrd.com/cs/Satellite?c=Content&cid=1395236547283&d=Mobile&pagename=EBRD%2FContent%2FHublet>

²⁷³ European Commission, "Saving Energy, Saving Money," <https://ec.europa.eu/energy/en/topics/energy-efficiency>.

²⁷⁴ European Commission, "Commission launches plans to curb energy use in heating and cooling," 17 February 2016. <https://ec.europa.eu/energy/en/news/commission-launches-plans-curb-energy-use-heating-and-cooling>.

²⁷⁵ European Commission, "Commission launches plans to curb energy use in heating and cooling," 17 February 2016.

²⁷⁶ Werner, Sven. "District heating and cooling in Sweden," *Energy* 126, (1 May 2017): 419-29.

<https://www.sciencedirect.com/science/article/pii/S0360544217304140?via%3Dihub#bib8>.

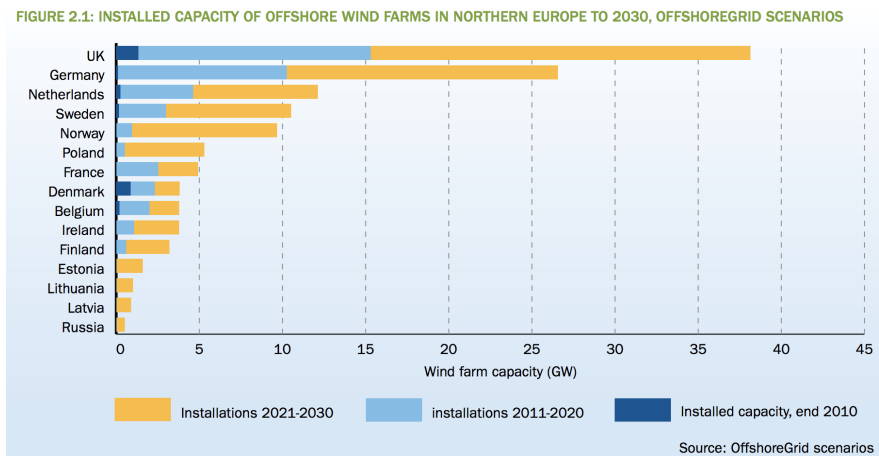
²⁷⁷ Appunn, Kerstine, "Combined heat and power - an Energiewende cornerstone?" *Clean Energy Wire*.

<https://www.cleanenergywire.org/factsheets/combined-heat-and-power-energiewende-cornerstone>.

Future Development of Wind Power in BSR

A major drawback for the full-utilization of renewable energy sources in Europe is its uneven geographic distribution. Conventional power plants are carefully designed to ensure the most efficient production and transmission of produced power. Renewable energy production, in contrast, is often limited by its source - nature, and it remains pertinent that because “sustainable energy generation like hydro, wind, sun, and waves are normally not located close to[...] consumption”, “...the transmission of the power [is] almost as essential as the production.”²⁷⁸ In order to best integrate wind energy, improvements in the energy grid will be necessary.

The rise in the production of wind energy has helped Nordic countries cut fossil based power supply prices very effectively, and wind power could have the potential to become one of the leading energy supply sources in BSR as well. The most common style of wind power generators employ spinning blades that transform wind energy inside of turbines, eventually transferring the generated power down to the ground for collection and transmission. Germany’s future installed capacity for wind-generated power will be 25% of the entire installed capacity. Among other BSR countries, Sweden, Finland and Denmark have a combined installed capacity of 31 GW, and the Baltic States have a combined installed capacity of 2 GW.²⁷⁹



For BSR countries, wind energy will be the main substitute after the phase out of nuclear power plants. Offshore wind power production is the most beneficial and efficient way of producing power, since wind speed at sea tend to be 70% - 100% higher than onshore speeds as well as more consistent.²⁸⁰ Germany currently has 21 operating offshore wind farms and three under construction. Scattered around the North Sea and the Baltic sea, 6 of them will have a capacity of more than 300 MW (0.3GW). To further increase the potential and efficiency of wind farms, Germany should target intergovernmental offshore grids. By connecting 114 of the existing 321 wind farms in the Baltic/North Sea area into hubs and transmitted between countries using the offshore electricity grid system, a total amount of €14 billion could be saved by 2030 comparing to connecting them individually to shore.²⁸¹ The establishment of such a grid could also help improve wind power’s variability by combining the wind power capacity in Germany with the hydro power capacity in Scandinavia.

²⁷⁸ Gunnar Asplund, " Sustainable energy systems with HVDC transmission", Power Engineering Society General Meeting (2004), p. 1.

²⁷⁹ “Wind energy scenarios for 2030,” The European Wind Energy Association, August 2015.

<https://www.ewea.org/fileadmin/files/library/publications/reports/EWEA-Wind-energy-scenarios-2030.pdf>

²⁸⁰ Kubbier, Jörg. “Offshore Wind Power in Germany,” Federal Ministry for Environment, Nature Conservation and Nuclear Safety, 2007.

²⁸¹ Techno-Economic, dena,EWEA, ForWind,IEO,NTUA,Senery,SINTEF. "Offshore Electricity Grid Infrastructure in Europe."

The Baltic Republics also have a lot of future potential in the establishment of offshore wind farms. A major development of offshore wind farms should be expected in the Baltic region starting after 2020. Currently, Lithuania's installed capacity is 500 MW, Estonia's is at around 300 MW, and Latvia's at 70MW. Estonia and Lithuania have a better potential in wind farms installations compare to Latvia, due to the slower average wind speed onshore, and concerns for the high-cost of offshore wind farms.²⁸² Both Lithuania and Estonia has been very actively involved in the future domestic development of wind power. In 2016, Lithuania's new installed wind capacity reached 178MW, which is 13% of their average consumption of 1.1GW. Estonia has two ongoing offshore wind projects, while other potential offshore wind farms have a projected capacity of 1000 MW and 165 MW, in Lithuania and Finland respectively.²⁸³

Biomass

Another sustainable resource that has future potential is energy produced from biomass. Biomass includes a wide range of materials such as, wood and wood waste, organic parts of solid wastes, sewage, manure, and by-products of farming and food production. The demand for energy produced from biomass experienced a rise from 5.7 exajoule (EJ) per year in 2012, to an estimated 10 EJ per year in 2020.²⁸⁴ The three main applications for biomass resources are heating, transportation, and electricity. The direct combustion of flammable biomass produces heat/electricity; the decomposition of garbage, human, and agriculture waste produces methane (biogas); the fermentation of sugar or starch crops produces carbohydrates that could be later transformed to ethanol (biofuels).²⁸⁵

Biomass energy plays an important role in helping European states reach their 20-20-20 goals and cut emissions of greenhouse gases (GHG). Biomass currently represents more than 60% of renewable energy production within the EU 28 and has potential for expansion in the BSR.²⁸⁶ In the future, demand for biomass energy is going to reach 124 Mtoe (the amount of energy released by burning one tonne of crude oil) by 2020, and 147 Mtoe by 2030. Forestry biomass' estimated consumption is between 76-110 Mtoe, compared to the estimated potential of 79-146 Mtoe.²⁸⁷ The following issues remain as the consumption of biomass energy increases:

- The release of greenhouse gases back into the atmosphere due to the cultivation, transportation and processing of biomass materials.
- Impacts of biomass combustion and production on air/water quality
- Low conversion efficiency of biomass to electricity

²⁸² Stockholm Environment Institute Tallinn Centre, "Baltic Sustainable Energy Strategy," 2008. <http://www.seit.ee/failid/368.pdf>.

²⁸³ Jegelevicius, Linas. "Baltics' renewable energy on the rise, with exceptions," *Renewables Now*, 13 June 2017. <https://renewablesnow.com/news/overview-baltics-renewable-energy-on-the-rise-with-exceptions-572105/>

²⁸⁴ Bentsen, Niclas S., and Claus Felby, "Biomass for energy in the European Union - a review of bioenergy resource assessments," *Biotechnology for Biofuels*. <https://biotechnologyforbiofuels.biomedcentral.com/articles/10.1186/1754-6834-5-25>.

²⁸⁵ U.S. Energy Information Administration, "Biomass -- renewable energy from plants and animals," https://www.eia.gov/energyexplained/?page=biomass_home.

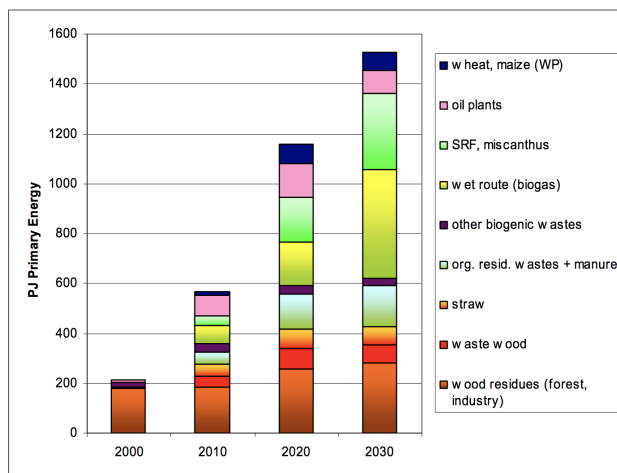
²⁸⁶ European Commission, "Sustainable and optimal use of biomass for energy in the EU beyond 2020," May 2017. https://ec.europa.eu/energy/sites/ener/files/documents/biosustain_report_final.pdf.

²⁸⁷ European Commission, "Sustainable and optimal use of biomass for energy in the EU beyond 2020," May 2017.

A case study in Denmark listed the future directions for many possible renewable energy sources (residual agriculture resources, energy crops, wind, etc.). Its results could be used by many other states in the BSR that have large biomass potential for future reference. These countries all have around 52% of their total land areas as forest areas (Finland, Norway, Sweden, Estonia and Latvia). The study used the Danish energy system in 2008 as a baseline, and then calculated the energy demand (heat, electricity, and fuels) in 2030 and 2050 and the environmental impacts of fulfilling these demands. The results demonstrated that:

- Future production of biomass as a sustainable energy should be limited since it can lead to future negative environmental consequences such as water eutrophication, land occupation and potential air pollution.

The EU is currently one of the world's biggest producers of sugar beets, constituting 50% of global production and with France, Germany, and Poland have the highest shares of potato and sugar beet production in the EU.²⁸⁸ The mass production of these crops not only occupies a sizeable area, but also produces unnecessary GHG emissions.



Source: OEKO (2004)

Nevertheless, there are still plenty of possible substitutes. One of the most viable solutions is to utilize the by-products of wood and paper production (wood chips, sawdust and paper sludge), solid waste, or even cereal straws and grasses. These materials contain cellulose that can be transferred into cellulosic ethanol.²⁸⁹ Cellulosic ethanol can reduce GHG emissions by approximately 88% or more, and can reduce carbon dioxide emissions to nearly zero compared to fossil fuels.²⁹⁰ Other considerations should include Aquatic microbial oxygenic photoautotrophs (AMOPs), as known as algae. AMOPs have the potential to produce a large amount of lipids and fermentable biomasses (starch and glycogen) that can then be used to generate energy. Furthermore, all algae has the capacity to produce energy-rich oils, some species even being found to have the ability to accumulate high oil levels in total dry biomass. Mass cultivation of AMOPs can be undertaken in open ponds near the coast, or in manmade nutrient-supplemented seawater. According to research, AMOPs are also efficient at collecting solar power, and could thus be converted into liquid fuels while simultaneously providing secondary by-products that could be used as animal feed.²⁹¹

²⁸⁸ Eurostat, "Agricultural production," http://ec.europa.eu/eurostat/statistics-explained/index.php/Agricultural_production_-_crops.

²⁸⁹ "Let's talk about converting wood to biofuels," Advanced Hardwood Biofuels Northeast, accessed February 2018. <http://hardwoodbiofuels.org/wp-content/uploads/2016/02/Conversion-Infosheet.pdf>

²⁹⁰ Solomon, Barry D., Justin R. Barnes, and Kathleen E. Halvorsen, "Grain and cellulosic ethanol: History, economics, and energy policy," Biomass and Bioenergy. <https://www.sciencedirect.com/science/article/pii/S0961953407000396?via%3Dihub>.

²⁹¹ Dismukes, Charles, Damian Carrieri, Nicholas Bennette, Gennady M. Ananyev, and Matthew C. Posewitz. "Aquatic phototrophs: efficient alternatives to land-based crops for biofuels." *Current Opinion in Biotechnology*. <https://www.sciencedirect.com/science/article/pii/S0958166908000608>.

Conclusion

As the largest state in the BSR, and as an emerging energy hub, Germany should focus on furthering the diversification of energy supplies to the region. In coordination with Poland, the Baltic Republics, Nordic countries, and the EU, Germany should pursue greater diversity in energy supplies by enhancing LNG facilities in the region, in particular in the Gulf of Finland. In addition to LNG, Germany, the EU, and states in the BSR should focus on enhancing energy interconnection through reverse flow pipelines, gas and hydro storage facilities, and electricity lines, in order to move closer to creating a Europe-wide Energy Union. At the same time,, a greater emphasis should be placed on renewable energy sources. Renewables have the ability to enhance regional energy security by creating greater diversity in indigenous energy markets. The long-term benefits of renewable energy include cleanliness, sustainability and transferability making it a worthwhile investment. The Baltic Republics also possess potential for increasing their share of renewable energy output. By implementing different renewable energy projects that fit their geographical characteristics, these states could improve energy sharing and maximize their renewable energy potential.

Recommendations

Increase Diversity of Supply

- *Build more LNG terminals in the BSR*
- *Diversify oil supplies by increasing imports of American and Middle Eastern oil*

Enhance Cooperation and Resource Sharing

- *Increase gas storage capabilities in the BSR to minimise disruptions in service and increase security against gas shutoff threats*
- *Invest in reverse flow pipelines between Germany and Poland and within the Baltic Republics*
- *Improve electricity interconnection between Germany and Poland, Estonia and Latvia to mitigate “loop flows”*

Shift Towards Renewables

- *Invest in onshore and offshore wind farms in the Baltic Republics*
- *Develop sustainable biomass energy infrastructures utilizing by-products of other industries*

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ENVIRONMENT AND ECONOMIC COOPERATION

Executive Summary

While states within the Baltic Sea Region have varying political structures and military interests, they all share one common vital resource - the Baltic Sea itself. Unfortunately, the Baltic Sea is one of the most polluted seas in the world,²⁹² which has wide-reaching detrimental effects on the health and safety of the BSR as a whole. From fishing and agriculture to tourism and transportation, the Baltic Sea is a major source of wealth and employment for the region. However, each of these industries, amongst others, contributes to and is negatively impacted by both climate change and eutrophication.

These man-made ecological challenges are not confined by borders, and do not cease when political divides within the region deepen. As such, responding to the difficulties posed by Baltic Sea eutrophication and climate change is an excellent opportunity for collaboration and cooperation between all states in the BSR. This poor ecological situation was created through the individual actions of each of the states, but it is only through multilateral cooperation that the BSR will be able to respond to the looming threats of climate change in a timely manner.

Germany should support and promote infrastructure programs such as Rail Baltica, which seeks to connect the Baltic Republics, thereby encouraging the development of tourism, providing jobs, and fostering unity between EU member states. There is room for economic growth in the region, especially if the port system is revamped, and a unified brand for Baltic Tourism can be established, which would benefit all BSR states, including Russia.

To ensure that this investment in tourism and infrastructure is not in vain, Germany should promote increased multilateral cooperation between all states of the BSR to address the growing concerns of climate change and continued Baltic eutrophication.²⁹³ As a leader within the region, Germany should ensure that EU Member States have measures in place to achieve their goals in response to the EU 2030 Climate and Energy Framework as well as the Paris Agreement, and in order to promote increased Russian involvement in climate action. Germany's role as the largest and wealthiest state in the BSR, in conjunction with its previous commitments to the Baltic Sea Action Plan and the Paris Climate Accord, should inspire the German government to strongly support measures to respond to these pressing ecological challenges. This can be done through the continued expansion and support of funding initiatives which specifically target the difficulties faced by individual citizens in their efforts to respond to climate change and mitigate eutrophication.

Eutrophication

Excessive inputs of nutrients, primarily nitrogen and phosphorus, to a marine environment, causing elevated levels of algal and plant growth, oxygen depletion, changes in species composition, and increased turbidity.

²⁹² Vorne, Virpi, and Frans Silvenius. "A Survey of Available Wastewater Treatment Technologies for Sparsely Populated Areas," User's Manual. Natural Resources Institute Finland (Luke), 2017.

²⁹³ "Eutrophication." Eutrophication, HELCOM, accessed January 2018. <http://www.helcom.fi/baltic-sea-trends/eutrophication/>

Transportation Infrastructure Projects in the Baltic Republics

BaltCap

International infrastructure in the BSR has ample room for improvement. BaltCap, a private equity and venture capital investor, announced a large infrastructure fund for the Baltic Republics, with a total target goal of €100 million. Each project undertaken by this infrastructure fund will have a budget between €3 million and €12 million. In an attempt to catalyse more private investment into BaltCap infrastructure fund, the European Investment Bank committed €20 million, hoping that more private investors will follow suit.²⁹⁴ Under BaltCap's infrastructure fund are companies such as Kelprojektas UAB of Lithuania, as well as Trev-2 Grupp AS of Estonia. Both Kelprojektas UAB and Trev-2 Grupp AS are the largest engineering firms in their respective countries, mainly tasked with updating and furthering infrastructure within their countries. A German contribution of anywhere between €5 million and €20 million to BaltCap's infrastructure fund may dramatically boost the infrastructure in the Baltic Republics as a direct result of German foreign investment.

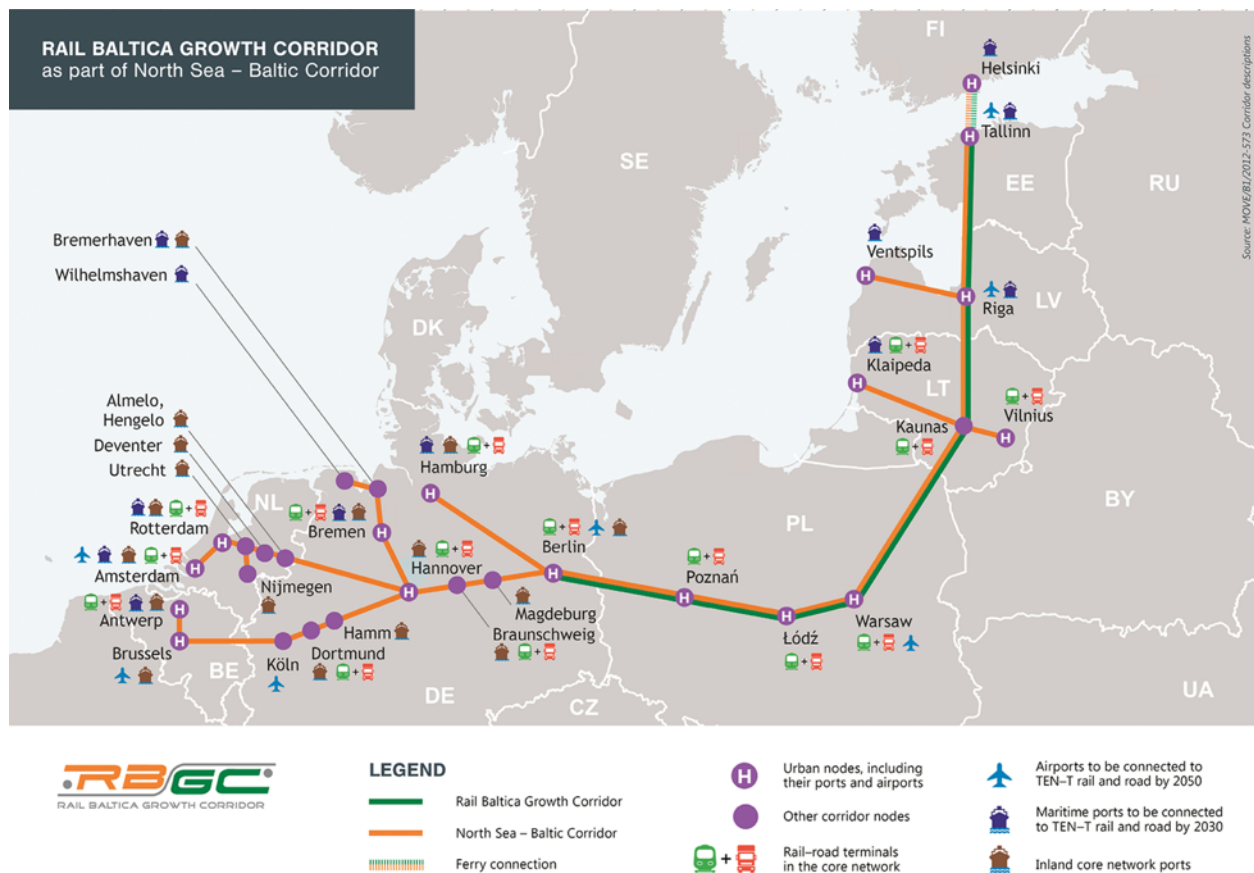


Figure 1: Rail Baltica's planned building, projected to cost a total of 5.8 Billion Euros.

Rail Baltica

Vital to both sea and land travel, there is undoubtedly a necessity for a centralized railway system connecting the Baltic Republic to the rest of Europe. Rail Baltica is the largest BSR

²⁹⁴ "BaltCap Infrastructure Fund | BaltCap Funds," *BaltCap*, accessed 15 February 2018. <http://www.baltcap.com/baltcap-funds/baltcap-infrastructure-fund>.

infrastructure project in the last 100 years, stretching from Helsinki to Belgium (See Figure 1). Rail Baltica is especially important for the Baltic Republics, as their railways are currently operating on the Soviet made 1520 mm gauge system. Rail Baltica will implement the European standard 1435 mm gauge system, which will make passenger and freight transportation to the rest of Europe significantly more efficient. Not only is Rail Baltica very efficient, it is powered by electricity--reducing noise and vibration for its passengers and those who live near it. Rail Baltica is integral for the BSR and the EU as a whole as it will “remove bottlenecks, build missing border connections, and promote modal integration and interoperability.”²⁹⁵

The estimated cost of the Rail Baltica project in the Baltic Republics is approximately €5.8 billion according to an Ernst and Young Cost-Benefit analysis study: Estonia – €1.35 billion (national share ~€268 million); Latvia – €1.968 billion (national share ~€393 million); Lithuania – €2.473 billion (national share ~€493 million).²⁹⁶ Despite the European Commission agreeing to cover around 85% of the cost, the Baltic Republics are having tremendous difficulty agreeing on funding each of their respective national shares. To add to the turmoil, there is internal conflict within the management board of Rail Baltica. Estonia and Lithuania both cast a no confidence vote for Baiba A. Rubesa, Chairperson of the Management Board and CEO of RB Rail AS – a joint venture founded by Estonia, Latvia and Lithuania.²⁹⁷ This action prompted European Commissioner for Transport, Violeta Bulc, to issue a stern warning to the Baltic Republics regarding the EU funding for Rail Baltica: "We have a very clear rule on the EU level: use it or lose it."²⁹⁸

Germany should demonstrate leadership on this matter and help the Baltic Republics come to an agreement on funding for Rail Baltica. Additionally, lobbying the EU to exercise some degree of patience towards the Baltic Republics’ commitment to Rail Baltica and its funding is paramount. Not coming to an agreement on funding for the Baltic Republics would be disastrous for the region’s economic connectivity. According to the Cost-Benefit analysis by EY, the measurable socio-economic benefits of a successful Rail Baltica are projected at €16.2 billion, with an additional GDP multiplier effect of €2 billion euros. These numbers greatly outweigh the €5.8 billion for projected cost of the project. Travel via Rail Baltica will save an estimated aggregate of €2.4 billion in time saving benefits, while the freight industry is projected to save an estimated aggregate of €2.9 billion in time saving benefits.²⁹⁹ Preventing the collapse of Rail Baltica is in the best interest of Germany and its domestic and foreign policy, as Germany will benefit from the increase in transportation/economic growth in the Baltic Republics.

Shipping

The Baltic Sea is one of the most active seas in the world, accounting for 15% of global cargo transportation.³⁰⁰ These cargo ships can maximize their efficiency through a modernization of

²⁹⁵ “Rail Baltica – Project of the Century.” Rail Baltica. Accessed February 21, 2018. <http://www.railbaltica.org/about-rail-baltica/>.

²⁹⁶ Rassa, Ilze. "Rail Baltica Global Cost-Benefit Analysis: The Project is Financially and Economically Viable." Rail Baltica. Accessed February 21, 2018. <http://www.railbaltica.org/cost-benefit-analysis/>.

²⁹⁷ Vahtla, Aili. "Lithuanian shareholder: Rubesa's statements damage Rail Baltica's stability," ERR, February 19, 2018, accessed 21 February 2018. <https://news.err.ee/684348/lithuanian-shareholder-rubesa-s-statements-damage-rail-baltica-s-stability>.

²⁹⁸ Vahtla, Aili. "EU transport commissioner on Rail Baltica funding: Use it or lose it." ERR. February 13, 2018. Accessed February 21, 2018. <https://news.err.ee/682858/eu-transport-commissioner-on-rail-baltica-funding-use-it-or-lose-it>.

²⁹⁹ Rassa, Ilze. "Rail Baltica Global Cost-Benefit Analysis: The Project is Financially and Economically Viable," Rail Baltica, accessed 21 February 2018.

³⁰⁰ “The Baltic Sea as a model region for green ports and maritime transport,” accessed 15 February 2018. http://www.bpoports.com/BPC/Helsinki/BPO_report_internet-final.pdf.

Baltic Sea ports. This modernization includes using cleaner fuels in port operations, electrification of port operations, eco-driving, and a digitalization of port equipment.³⁰¹ However, equally important to the modernization of the ports themselves is the modernization of railway transportation and inland road transport. One of the proposed methods of improving inland transportation pertains directly to the implementation of Rail Baltica.

Baltic Tourism

The majority of the tourism in the BSR occurs during the summer months. Coastal towns across the BSR encounter major economic issues because of this, as they experience an influx of initial tourism, followed by an autumn to spring lull. This initial boom in tourism creates an economic dependence on summer season tourism, resulting in empty resorts and minimal income immediately after summer ends. These Baltic towns are left with two courses of action: maximize economic production during the summer season tourism, or incentivize tourism during the winter months. Fortunately, there are several methods of extending the tourism season in the BSR.

The Baltic Republics must develop a unified brand in order to market themselves effectively in order to maximize the economic production of the tourism industry in both the winter and summer seasons. According to Dr. Melanie Kay Smith of the University of Tartu in Estonia, the Baltic Republics “still suffer somewhat from the lack of a distinctive tourist image in many parts of the world and the countries are often perceived to be synonymous with their capital city or some nationalities fail to recognize the differences between the countries.”³⁰² For this reason alone, it would be beneficial for the Baltic Republics to continue to form a united front in order to promote their tourism industries. While several of these sorts of initiatives already exist, there is still substantial room for improvement in the branding of Baltic Republic tourism.

Cruise Ship Industry

The BSR is home to a wide array of UNESCO World Heritage Sites. One of the best ways of navigating such sites is through short visits in Baltic ports via the cruise ship industry. The cruise ship market is a prime example of a predominately summer industry that has grown tremendously in recent years. In fact, “the number of cruise ship passengers has increased more than four fold: from 1,072,000 passengers in 2000 to 4,297,000 in 2015 with an average annual growth rate of 9.7%.”³⁰³ This impressive growth rate, however, is surprisingly undermatched in the BSR, with a mere 2.6% growth rate in port calls over the same duration.

The shipping industry’s maximization of profits in this regard is noteworthy, however, the negative environmental impacts of this industry should not be ignored. A possible solution to this conundrum is for both the shipping and cruise industries to consider switching to alternative, low sulphur fuels. Liquified natural gas and methanol provide for a practical solution to the Baltic Sea pollution issue, allowing for an increase in port calls, passengers, and overall economic growth in the cruise shipping industry, while greatly reducing the environmental repercussions on other industries, such as the fishing industry.

³⁰¹ "The Baltic Sea as a model region for green ports and maritime transport." Accessed February 15, 2018.

³⁰²Smith, Dr. Melanie Kay. "Baltic Health Tourism Report," The Tourism Observatory, for Health, Wellness and Spa, 2014, 18, accessed 12 February 2018. <http://wellnesseducation.pc.ut.ee/wp-content/uploads/2016/05/Baltic-Health-Tourism-Report.pdf>

³⁰³ "The Baltic Sea as a model region for green ports and maritime transport." Accessed February 15, 2018.

Fishing

The fishing industry in the Baltic Sea has always been a source of year-round income and employment, and has the ability to grow substantially, but it must first adapt before it is able to do so. Counterintuitively, in order for the fishing industry in the Baltic Sea to grow, it must first shrink. According to Oceana, a Non Governmental Organization dedicated to ocean conservation, the fishing industry must reduce its total allowable catches (TAC) of cod by 75% (1,376) in 2018 or else risk irreparable damage to the ecosystem of Baltic cod (See Figure 2).³⁰⁴ Cod is by far the species most endangered, however there are still considerable recommendations of reductions in TAC to the herring and salmon population as well. Lasse Gustavson, the executive director of Oceana stated on October 4, 2017 that, “ending overfishing in EU waters is not only good for the environment; it’s also good for the economy. Ensuring healthy fish stocks and exploiting them at their maximum sustainable yield could generate €4.9 billion a year to EU economies and create more than 92 thousand new jobs,”³⁰⁵ with a large percentage of that benefitting the Baltic States.

Figure 2: Oceana’s fishing limits proposal given as a part of their annual fishing recommendation on Baltic Sea

Table 1: Oceana’s fishing limits proposal for Baltic Sea stocks

Quantities are given in tonnes, except for salmon, which is expressed as a number of individuals.
Brackets show TAC difference in % to the previous year, i.e. negative % indicates a reduction; positive % indicates an increase in the TAC.

Species	ICES Fishing area	TAC 2017 ²	ICES advice 2018	EC proposal ³	Stock Status	Oceana’s proposal 2018
Cod (<i>Gadus morhua</i>)	SD 22-24	5,597 (-56%)	1,376 – 3,541	5,597	Below MSY B_{lim} , F>F _{MSY}	1,376 (-75%)
Cod (<i>Gadus morhua</i>)	SD 25-32	30,857 (-25%)	26,071	22,275	Unknown	24,767 (-20%)**
Herring (<i>Clupea harengus</i>)	SD 22-24*	28,401 (+8%)*	17,309	12,987	Below MSY $B_{trigger}$, F>F _{MSY}	17,309 (-39%)
Herring (<i>Clupea harengus</i>)	SD 25-29 & 32	191,129 (+8%)	267,745***	238,229	Above MSY $B_{trigger}$	238,229 (+25%)
Herring (<i>Clupea harengus</i>)	SD 28.1	31,074 (-11%)	24,919***	28,999	Above MSY $B_{trigger}$, F>F _{MSY}	28,999 (-7%)
Herring (<i>Clupea harengus</i>)	SD 30-31	140,998 (+17%)	95,566	70,617	Above MSY $B_{trigger}$, F>F _{MSY}	95,566 (-32%)
Sprat (<i>Sprattus sprattus</i>)	SD 22-32	260,993 (+29%)	291,715***	262,310	Above MSY $B_{trigger}$	262,310 (+0.5%)**
Plaice (<i>Pleuronectes platessa</i>)	SD 22-32*	7,862 (+95%)*	3,104 (SD 24-32) 5,405 (SD 21-23)	6,272	Undefined (SD 24-32) Above MSY $B_{trigger}$ (SD 21-23)	6,272 (-20%)
Salmon (<i>Salmo salar</i>)	SD 22-31	95,928 (0%)	116,000	106,096	N/A	79,595 (-17%)**
Salmon (<i>Salmo salar</i>)	SD 32	10,485 (-20%)	9,558	10,003	N/A	8,669 (-17%)** No targeted fishing for wild fish

* The ICES advice area and EU management area do not match.

** Russian share of the TAC already excluded.

*** As corresponding to F_{MSY}.

² Fishing opportunities in the Baltic Sea for 2017, http://www.consilium.europa.eu/en/meetings/agrifish/2016/10/community-total-allowable-catches-tacs-in-the-baltic-sea-for-2017_pdf/

³ <https://ec.europa.eu/transparency/regdoc/rep/1/2017/EN/COM-2017-461-F1-EN-ANNEX-1-PART-1.PDF>

Stocks.

Fishing tourism has the potential to become a major global draw to the Baltic Sea. Sweden currently leads the way in this regard, but there is still considerable opportunities for the other Baltic States to get involved. Coastal angling tourism, also known as CATCH, is a commission funded by Interreg and the EU, aimed at promoting the angling tourism industry in the South Baltic. Expanding the CATCH commission to cover the entire BSR, and approaching Russia

³⁰⁴ “Recommendations on fishing opportunities for 2018 Baltic Sea Stocks,” Oceana, August 2017, accessed 1 February 2018.

<http://eu.oceana.org/en/publications/reports/oceanas-recommendations-fishing-opportunities-2018-baltic-sea-stocks>.

³⁰⁵ Gustavsson, Lasse. “EU ministers must put an end to overfishing in the Baltic Sea now,” Oceana, October 4, 2017, accessed 1 February 2018. <http://oceana.org/press-center/press-releases/eu-ministers-must-put-end-overfishing-baltic-sea-now>.

about joining, could be a beneficial attempt to bridge the gap between Russia and the West. The CATCH commission officially has a budget of around 1.5 million euros,³⁰⁶ but could benefit from doubling of its budget in order to increase alternate season tourism in the BSR, especially if it is to be expanded to the northern states as well as Russia.

Best Practices Highlights

Baltic Sea Region Programme

*Interreg: Baltic Sea Region Programme 2014-2020*³⁰⁷

The EU's Baltic Sea Region Funding Cooperative to provide financial support for projects that promote an innovative, accessible, and sustainable Baltic Sea Region. Priorities include,

- Capacity for innovation
- Efficient management of natural resources
- Sustainable transport
- EU strategy support

Funding is provided by the European Regional Development Fund (ERDF), the European Neighborhood Instrument (ENI), Norwegian national funding, and through a variety of partners including Russia (as of 2 February 2018).³⁰⁸

Healthcare

Healthcare tourism is one of the most lucrative industries for year-round tourism in the Baltic Republics, and is one of the most rapidly developing sectors of tourism in the world. Recent EU legislation providing access to short-term medical care in every member state was a major step in making the BSR one of the best places in the world for healthcare tourism.³⁰⁹ For those with heart issues, for example, "the moderate temperature and high concentrations of iodine can augment the effects of medicinal treatments."³¹⁰ In fact, Lithuania ranks 10th in the world in healthcare tourism,³¹¹ and the other Baltic Republics could follow this example in order to increase off-season tourism.

Despite its impressive success to date, healthcare tourism in the coastal regions of the Baltic Sea has ample room for growth. Assisting in the development of a healthcare tourism collection in the coastal region of the Baltic Sea would benefit Germany as well as the Baltic Republics. One of the largest impediments to a boom in healthcare tourism is the lack of a unified healthcare tourism cluster among the states. The Baltic Republics lack a unified tourist image and are somewhat indistinguishable to the rest of the world. Not only would healthcare tourism assist in

³⁰⁶ Benkenstein, Martin "CATCH - Coastal Angling Tourism - a development chance for the South Baltic Region." *CATCH - Coastal Angling Tourism*, accessed 1 February 2018. <https://southbaltic.eu/-/catch-coastal-angling-tourism-a-development-chance-for-the-south-baltic-region>.
<https://southbaltic.eu/-/catch-coastal-angling-tourism-a-development-chance-for-the-south-baltic-region>.

³⁰⁷ "About the Programme," *Interreg Baltic Sea Region*, accessed February 2018. <http://www.interreg-baltic.eu/about-the-programme.html>

³⁰⁸ "Financing Agreement signed: Russian participation in Baltic Sea cooperation now on solid grounds." *Interreg Baltic Sea Region*, accessed February 2018. <http://www.interreg-baltic.eu/news-detail/news/financing-agreement-signed-russian-participation-in-baltic-sea-cooperation-now-on-solid-grounds.html>

³⁰⁹ Lonyszyn, Przemyslaw, and Olga Terefenko, "Creation of an alternative season based on sustainable tourism as an opportunity for Baltic Sea Region," *Journal of Coastal Research*, April 2014, accessed 1 February 2018. <http://www.jstor.org/stable/43290995>,

³¹⁰ Lonyszyn, Przemyslaw, and Olga Terefenko. "Creation of an alternative season based on sustainable tourism as an opportunity for Baltic Sea Region." *Journal of Coastal Research*. April 2014. Accessed February 1, 2018.

³¹¹ Lonyszyn, Przemyslaw, and Olga Terefenko. "Creation of an alternative season based on sustainable tourism as an opportunity for Baltic Sea Region." *Journal of Coastal Research*. April 2014. Accessed February 1, 2018.

solving that issue, research also indicates that the cluster would “improve not only the image but also quality, new product development, packaging, education and training, exchange of information and the pooling of financial resources”.³¹² Furthering the promotion and unification of this growing industry in the coastal region of the Baltic Sea will serve to bolster the regional economies.

Ecotourism

The BSR’s Parks and Benefits (P&B) program, which fall under the Federation of Nature and National Parks of Europe (EUROPARC), consists of eight parks in countries across the region. The P&B program found that many of these parks accessibility and tourism demands exceed the carrying capacity of the parks’ systems (See Figure 3). In both the large and small protected parks, high visitation levels create issues such as high volumes of traffic and demands for tourist parking. “In areas of high density of networks the problems are rather, that there are too many motor vehicles and too many visitations concentrated in certain time periods than too many users in total. In areas with low density of networks is the challenge already from the beginning, not to generate private transport with motor vehicles.”³¹³

Developing a sustainable mechanism for transportation to protected areas is paramount for the long term success of ecotourism. It is very difficult for day-trippers and even overnight travelers to find an alternative source of travel when going to rural parks. In this regard, Rail Baltica appears to be at least a partial solution. Having an electric, minimally noisy rail system in place would encourage ecotourists to visit protected areas while giving them the peace of mind of a limited carbon footprint. Specifically, hikers and cyclists could easily navigate the BSR and its natural wonders with relative ease. Figure 3: Visitor and population data of the Parks and Benefits Parks³¹⁴

Dovefall-Sannaliggella National Park Norway	Nature Park Marboesene Denmark	Militz National Park Germany	Biosphere Reserve South-East-Rügen Germany	Zemaitija National Park Lithuania	Mansala National Park Estonia	Kemer National Park Latvia	Kuruvonai Regional Park Lithuania	
1.706	47	327	228	209	501	385	189	Size of the Park (in km2)
917.734	585.990	143.772	68.126	171.132	160.470	389.293	341.687	Population in the NUTS-3-level-regions, in which the park is situated, persons.
917.734	585.990	727.177	392.854	547.681	300.144	1.095.706	512.819	Population in the NUTS-3-level regions covering the park and areas situated less than 25 km from the park, persons.
15	8	35	500	80	15	45	120	Estimated number of day tourists per year (in 1.000)
5	7	340	390	40	5	15	13	Estimated number of overnight tourists (guest-arrivals) per year (in 1.000)
20	15	375	900	120	20	60	133	Estimated number of visitors per year (in 1.000)
-	997	15	19.600	1.000	62	900	1.105	Number of accommodation spaces within the park
11.430	1.471	100	34.000	1.000	112	1.830	1.400	Number of accommodation spaces within 5 km from the park (including the park)
17	34	1.626	2.142	48	10	135	15	Number of guest overnight stays per year (in 1.000)
3,4	4,9	4,8	5,5	1,2	2,0	9,0	1,2	Average number of overnight stays per overnight tourists
1,5	13,0	14.139,1	4,0	-	57,5	49,5	-	Overnight stays per year per bed
0,4%	1,9%	40,5%	0,1%	-	26,8%	1,7%	-	Ratio of over-night stays to bed-night supply <5km
12	3	1	499	0	1	5	0	Beds <5 km per 1.000 locals in park NUTS-3-level
12	3	0	87	0	0	2	0	Beds <5 km per 1.000 locals <25 km
76%	50%	9%	56%	50%	75%	75%	-	Share of day visits in total visits
21	9	48	1.273	91	50	41	0	Day visits per 1.000 locals <25 km
1,9	0,1	0,4	0,7	0,4	1,7	0,4	0,4	Park area per inhabitant (km2/1.000 locals <25 km)

³¹²Smith, Dr. Melanie Kay . "Baltic Health Tourism Report." *The Tourism Observatory, for Health, Wellness and Spa*, 2014, 18. Accessed February 12, 2018. <http://wellnesseducation.pc.ut.ee/wp-content/uploads/2016/05/Baltic-Health-Tourism-Report.pdf> 18

³¹³ Brandt, Jesper, Anders Hansen, Jörg Becken, Phillip Wagner, and Marion Laube. "Parks & Benefits Baltic Protected Areas and Tourism," *Baltic Sea Region Programme 2007-2013*, accessed 25 February 2018, 9. www.baltic-ecoregion.eu/downloads/10_Perspectives_Tourism.pdf.

³¹⁴ Brandt, Jesper, Anders Hansen, Jörg Becken, Phillip Wagner, and Marion Laube. "Parks & Benefits Baltic Protected Areas and Tourism," *Baltic Sea Region Programme 2007-2013*, accessed 25 February 2018, 14.

Climate Change in the Baltic Sea Region

The projected impacts of climate change on the Baltic Sea Region during the 21st Century present a serious threat to regional security, stability, and prosperity for Germany and the other states within this region. The long-term consequences threaten the political and economic future of all states bordering the Baltic Sea.

The BSR specifically is projected to experience increased precipitation and heat waves, increasing the likelihood of both extreme droughts and severe flooding. In the north Baltic, the winter ice season has been steadily decreasing and winter snow volume is also projected to decrease, in turn reducing the volume of annual river discharges in the southern regions. Eutrophication, due in large part to agricultural runoff and poor waste management, has damaged large parts of the Sea. Additionally, sea level rise in the Baltic Sea is projected to increase between 0.6-1.1 meters by the end of the 21st Century.³¹⁵

Germany maintains a very strong relationship with all states in the BSR due to strong mutual interests in trade and the environment. The effects of more severe and unpredictable weather events in the coming decades pose a threat to German agriculture, manufacturing, transportation, and the wellbeing of the German people.

Challenges

The wide-ranging impacts of climate change over the course of the 21st Century will be felt all over the world, and the BSR is no exception. Projected increases in both air and ocean temperature, as well as sea-level rise, will adversely affect the region and the nation-states within it. These long-term effects are currently being addressed to varying degrees by individual states as well as international organizations, such as the United Nations Framework Convention on Climate Change (UNFCCC),³¹⁶ and the Baltic Marine Environment Protection Commission, otherwise known as the Helsinki Commission (HELCOM). All states bordering the Baltic Sea have signed the Paris Climate Agreement, and all states except Russia have ratified it. Currently, each individual state is responsible for implementing their own goals to ensure that global temperature rise is no greater than 2 degrees Celsius.³¹⁷ Multinational cooperation between all Baltic Sea states is essential to limit further warming and ensure that each state can adapt to changes in the Earth's climate.

Rising temperatures in the region will threaten agriculture and food production, and severe and persistent heat-waves pose a threat to local populations, especially the elderly. The 2003 European Heat Wave is just one example of the disastrous effects heat waves, amplified by climate change, can have on both ecosystems and societies.³¹⁸ Long-lasting drought can also have a disastrous effect on food production and fresh-water sources. Extreme precipitation events can inundate large swaths of land, including productive farmland as well as urban areas.

³¹⁵ HELCOM "Baltic Sea Environment Proceedings No. 137 Climate change in the Baltic Sea Area HELCOM thematic Assessment in 2013" Accessed January 31, 2018. <http://www.helcom.fi/Lists/Publications/BSEP137.pdf>.

³¹⁶ "United Nations Framework Convention on Climate Change," UNFCCC, accessed 1 February 2018. http://unfccc.int/files/essential_background/background_publications_htmlpdf/application/pdf/conveng.pdf.

³¹⁷ UNFCCC, "Paris Agreement," accessed 31 January 2018. http://unfccc.int/files/essential_background/convention/application/pdf/english_paris_agreement.pdf.

³¹⁸ Beniston, Martin, "The 2003 Heat Wave in Europe: A Shape of Things to Come? An Analysis Based on Swiss Climatological Data and Model Simulations." *Geophysical Research Letters* 31, no. 2 (January 1, 2004): L022202. <https://doi.org/10.1029/2003GL018857>.

Over-time these impacts on people, if left unabated, could lead to widespread unrest and political upheaval.³¹⁹ Each state in the BSR will be affected in different orders of magnitude, depending on how well prepared they are. Because climate change is a long-term issue, its effects will become increasingly more severe over the course of the 21st Century and beyond. Due to the sheer scale and persistence of these long-term trends, states will need to mitigate the damage as much as possible and adapt to the enduring consequences of our changing climate.

Mitigation

Mitigating the effects of climate change involves reducing Anthropogenic GHG emissions while increasing GHG sinks in order for the projected changes in the Earth's climate to be less severe.³²⁰ The European Commission has outlined a shared goal for all member states to reduce GHG emissions within the EU by 40% of 1990 levels by the year 2030.³²¹ This is an ambitious, yet attainable goal, and Germany has been taking the lead every step of the way. Currently Germany is setting their goals based on the 1.5 degrees Celsius increase limit set by the Paris Agreement. Germany has taken concrete measures to reduce GHG emissions in the energy, agriculture, forestry, and transportation sectors to attain this goal.³²² The German Federal Government has taken an active role in improving environmental protection and regulation laws, which have been a stated objective in the Basic Law since 1994.³²³ Yet despite advancements in renewable energy and reducing GHG emissions by about 23% between 1990 and 2012,³²⁴ Germany continues to rely on fossil fuels for about 80% of its energy consumption and remains the second largest emitter of GHG emissions among the Baltic Sea states.³²⁵ Germany must reduce its dependence on fossil fuels in order to further its reduction of GHG emissions. Fortunately, Germany overall provides an ideal role model for all EU member states to reduce their GHG emissions and to do so attainably.

The broader goal of reducing GHG emissions as a means to mitigate the consequences of climate change can be achieved through attaining specific outlined goals. The European Commission 2030 Climate and Energy Framework outlines several specific and attainable measures to reduce GHG emissions. This pre-existing framework can be utilized by the states in the BSR as an overarching guideline for increasing cooperation. The Framework has been approved by all EU

³¹⁹IPCC, 2014: Summary for policymakers. In: Climate Change 2014: Impacts, Adaptation, and Vulnerability. Part A: Global and Sectoral Aspects. Contribution of Working Group II to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change [Field, C.B., V.R. Barros, D.J. Dokken, K.J. Mach, M.D. Mastrandrea, T.E. Bilir, M. Chatterjee, K.L. Ebi, Y.O. Estrada, R.C. Genova, B. Girma, E.S. Kissel, A.N. Levy, S. MacCracken, P.R. Mastrandrea, and L.L.White (eds.)]. Cambridge University Press, Cambridge, United Kingdom and New York, NY, USA IPCC, 2014: Summary for Policymakers. In: Climate Change 2014: Mitigation of Climate Change. Contribution of Working Group III to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change [Edenhofer, O., R. Pichs-Madruga, Y. Sokona, E. Farahani, S. Kadner, K. Seyboth, A. Adler, I. Baum, S. Brunner, P. Eickemeier, B. Kriemann, J. Savolainen, S. Schlömer, C. von Stechow, T. Zwickel and J.C. Minx (eds.)]. Cambridge University Press, Cambridge, United Kingdom and New York, NY, USA.

³²⁰ IPCC, 2014: Summary for Policymakers. In: Climate Change 2014: Mitigation of Climate Change. Contribution of Working Group III to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change [Edenhofer, O., R. Pichs-Madruga, Y. Sokona, E. Farahani, S. Kadner, K. Seyboth, A. Adler, I. Baum, S. Brunner, P. Eickemeier, B. Kriemann, J. Savolainen, S. Schlömer, C. von Stechow, T. Zwickel and J.C. Minx (eds.)]. Cambridge University Press, Cambridge, United Kingdom and New York, NY, USA.

³²¹ European Commission, "2030 Climate & Energy Framework," European Commission, November 23, 2016. https://ec.europa.eu/clima/policies/strategies/2030_en.

³²²"What Does the Paris Agreement Mean for Climate Protection in Germany?" NewClimate Institute (blog), February 23, 2016.

<https://newclimate.org/2016/02/23/what-does-the-paris-agreement-mean-for-climate-protection-in-germany/>.

³²³ Facts about Germany, "A Pioneer in Climate Policy," January 26, 2016. <https://www.tatsachen-ueber-deutschland.de/en/categories/environment-climate/pioneer-climate-policy>.

³²⁴ UNFCCC, "Summary of GHG Emissions for Germany," accessed 31 January 2018.

https://unfccc.int/files/ghg_emissions_data/application/pdf/deu_ghg_profile.pdf.

³²⁵ "Germany's Energy Consumption and Power Mix in Charts." *Clean Energy Wire*, June 17, 2015.

<https://www.cleanenergywire.org/factsheets/germanys-energy-consumption-and-power-mix-charts>.

member states in the region and already sets out specific objectives for mitigating climate change by creating tangible goals to reduce GHG emissions by 40% of 1990 levels by 2030.

The majority of states in the BSR have made significant progress towards the goals outlined by the EU Commission on Climate Action. Between 1990 and 2012, Poland,³²⁶ Denmark,³²⁷ Finland,³²⁸ Sweden,³²⁹ Lithuania,³³⁰ Estonia,³³¹ and Latvia³³² have all reduced their GHG emissions by at least 30% when including Land Use, Land Use Change, and Forestry (LULUCF). LULUCF refers to human activities that change carbon sinks, including agricultural and forestry practices, which can both increase or decrease GHG emissions. However two states, Poland and Lithuania, have actually seen their emissions increase between the years 2000 and 2012. This is concerning as it decreases the long-term progress made since 1990 and undermines the current EU-wide goal and hampers some of the positive progress made. Because of this, Germany as well as the other Baltic Sea states should work with both Poland and Lithuania to help them take steps to achieve this goal.

GHG Emissions with LULUCF By Country 1990-2012 (Gg)

Country	Russia*	Germany	Poland**	Denmark	Finland	Sweden	Lithuania	Estonia	Latvia
1990 levels	3,532,352.5	1,223,530.7	556,906.7	75,303.3	56,653.9	34,027.3	44,427.8	30,637	6,346.4
2000 levels	1,649,026	1,016,399.5	365,503.6	73,189.7	50,016.3	26,058.7	10,245.5	21,817.9	-4,096.8
2012 levels	1,755,135	935,595.5	367,413.3	52,280.9	35,113.1	22,192.2	13,546.1	9,802.3	-1,320.9
% Change 1990-2012	-50.3%	-23.5%	-34%	-30.6%	-38%	-34.8%	-69.5%	-68%	--
% Change 2000-2012	+6.4%	-8%	+0.5%	-28.6%	-29.8	-14.8%	+32.2%	-55.1%	-67.8%

*1990 levels prior to collapse of USSR

**Poland start year 1988 as opposed to 1990 for all others

The other exception to this trend in the BSR is Russia, which is the single largest emitter of GHG emissions within the BSR. In the 2010 Copenhagen Accord, Russia pledged to reduce its GHG emissions between 15-20% of 1990 levels by the year 2020.³³³ However, this pledge is misleading because 1990 GHG levels accounted for all republics within the USSR, not Russia specifically. The subsequent collapse of the USSR resulted in a sharp decrease of emissions from

³²⁶ UNFCCC, "Summary of GHG Emissions for Poland," accessed 31 January 2018.

https://unfccc.int/files/ghg_emissions_data/application/pdf/pol_ghg_profile.pdf.

³²⁷ UNFCCC, "Summary of GHG Emissions for Denmark," accessed 31 January 2018.

https://unfccc.int/files/ghg_emissions_data/application/pdf/dnk_ghg_profile.pdf.

³²⁸ UNFCCC, "Summary of GHG Emissions for Finland," accessed 31 January 2018.

https://unfccc.int/files/ghg_emissions_data/application/pdf/fin_ghg_profile.pdf.

³²⁹ UNFCCC, "Summary of GHG Emissions for Sweden," accessed 31 January 2018.

https://unfccc.int/files/ghg_emissions_data/application/pdf/swe_ghg_profile.pdf.

³³⁰ UNFCCC, "Summary of GHG Emissions for Lithuania," accessed 31 January 2018.

https://unfccc.int/files/ghg_emissions_data/application/pdf/ltu_ghg_profile.pdf.

³³¹ UNFCCC, "Summary of GHG Emissions for Estonia," accessed 31 January 2018.

http://uat.unfccc.int/files/ghg_emissions_data/application/pdf/est_ghg_profile.pdf.

³³² UNFCCC, "Summary of GHG Emissions for Latvia," accessed 31 January 2018.

https://unfccc.int/files/ghg_emissions_data/application/pdf/lva_ghg_profile.pdf.

³³³ UNFCCC, "Russia, Copenhagen Accord," accessed 1 February 2018.

https://unfccc.int/files/meetings/cop_15/copenhagen_accord/application/pdf/russiaacphaccord_app1.pdf.

Russia, and has exaggerated Russia's emissions reductions in the following decades. Between 1990 and 2012 Russia appears to have reduced its GHG emissions by about 34%, yet this is offset by the 6.4% increase in emissions between 2000-2012.³³⁴ This is especially alarming because Russia is projected to continue to increase its emissions until 2030.³³⁵ Russia has indicated that its long-term goal is to reduce GHG emissions by at least 50% of 1990 levels by 2050, however there is currently no national document confirming this goal.³³⁶ Therefore it should be a priority for Germany and the international community to urge Russia to officially establish a national framework towards attaining a reduction of emissions by at least 50% of 1990 levels by 2050.

Russia's failure to ratify the Paris Agreement is yet another serious impediment to Russia decreasing its GHG emissions. The Paris Agreement has been ratified by all other states of the BSR, and although it has signed the Agreement, Russia is not yet legally bound to the Agreement until it is ratified by the Russian Duma.³³⁷ Ratifying the Paris Agreement would show Russia's neighbors, and the world, that it is serious about mitigating climate change, and would also increase mutual responsibility, goals, and cooperation with its neighbors. Germany and the other Baltic Sea states should therefore strongly advocate that Russia ratify the Paris Agreement. This measure would help improve relations amongst the BSR by fostering a mutual obligation and commitment between the various states to cooperate together towards the common goals outlined in the agreement.

One way to encourage Russia to ratify the Paris Agreement is to provide increased funding for Russian projects within the Interreg Baltic Sea Region Programme 2014-2020. Interreg projects with Russian partners are not limited by the existing EU sanctions regime. Currently Russian partners in 15 Interreg projects are calling for €2.9 million.³³⁸ These projects are mostly related to increasing capacity for innovation and managing natural resources, mostly in the St. Petersburg and Kaliningrad regions. Increasing Interreg funding for Russian partners from the existing amount could be provided as a way to incentivize Russia into ratifying the Paris Agreement.

Adaptation

Mitigation policies have yet to have any impact on climate change or its projected consequences during the 21st Century because annual GHG emissions continue to increase. This is already leading to drastic and irreversible changes to the Earth's climate, and the only viable pathway forward is for countries to prepare for these long-term changes³³⁹ through serious adaptation

³³⁴ UNFCCC, "Summary of GHG Emissions for Russian Federation," accessed 31 January 2018. https://unfccc.int/files/ghg_emissions_data/application/pdf/rus_ghg_profile.pdf.

³³⁵ Climate Action Tracker, "Climate Action Tracker Russian Federation," November 6, 2017, accessed 20 January 2018. <http://climateactiontracker.org/countries/russianfederation.html>.

³³⁶ "Climate Change Solutions: Frontline Perspectives from Around the Globe," *Yale Center for Environmental Law & Policy*, September 2014, accessed 31 January 2018.

³³⁷ Climate Action Tracker, "Climate Action Tracker Russian Federation," November 6, 2017, accessed 20 January 2018.

³³⁸ "Financing Agreement signed: Russian participation in Baltic Sea cooperation now on solid grounds." Interreg Baltic Sea Region, accessed February 2018. <http://www.interreg-baltic.eu/news-detail/news/financing-agreement-signed-russian-participation-in-baltic-sea-cooperation-now-on-solid-grounds.html>

³³⁹ IPCC, 2014: Summary for policymakers. In: *Climate Change 2014: Impacts, Adaptation, and Vulnerability. Part A: Global and Sectoral Aspects. Contribution of Working Group II to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change* [Field, C.B., V.R. Barros, D.J. Dokken, K.J. Mach, M.D. Mastrandrea, T.E. Bilir, M. Chatterjee, K.L. Ebi, Y.O. Estrada, R.C. Genova, B. Girma, E.S. Kissel, A.N. Levy, S. MacCracken, P.R. Mastrandrea, and L.L. White (eds.)]. Cambridge University Press, Cambridge, United Kingdom and New York, NY, USA, 1-32.

measures. The Intergovernmental Panel on Climate Change (IPCC) views adaptation as the “process of adjustment to actual or expected climate and its effects. In human systems, adaptation seeks to moderate or avoid harm or exploit beneficial opportunities. In some natural systems, human intervention may facilitate adjustment to expected climate and its effects.”³⁴⁰

Within the BSR, adaptation measures should continue to be made towards the expected effects of regional temperature rise, which will lead to decreased snowpack, reduced river flows, increased chance of extreme heatwaves and droughts, as well as increased precipitation and increased likelihood of extreme flooding, and a projected sea-level rise between .6 metres and 1.1 metres during the 21st Century.³⁴¹ These projected changes in the Baltic Sea will affect all states in the region, and thus it is in each state’s common interest to work together to adapt in order to better prepare themselves for this eventuality.

Germany should urge the European Investment Bank to create a regional focus on the BSR so that all states surrounding the Baltic Sea are prepared and equipped to respond to the diverse array of threats climate change presents. Efforts should be made for an EIB regional loan program for the BSR to provide loans and opportunities for the states in the region to adapt to the threats of projected sea-level rise in the Baltic Sea.

EIB Climate Change Funding and Loans

Currently, the EIB employs several different measures for funding and loan opportunities for climate change projects.³⁴² One measure is carbon pricing, based on a cost-benefit analysis of carbon emissions for economic value versus the natural impacts and variability. This is thoroughly explained in the Economic Appraisal of Investment Projects at the EIB.³⁴³ The EIB’s Financial tools for funding climate projects also include equity funds and layered risk funds such as the Green for Growth Fund, the European Energy Efficiency Fund, and the Global Energy Efficiency and Renewable Energy Fund. Green Bonds, which are tax exempt and used for lending, are also used by the EIB as a means to encourage investors to focus on sustainable investments. The Climate Awareness Bond (CAB) is a specific Green Bond whose proceeds are saved for EIB lending projects for renewable energy and energy efficiency.³⁴⁴

The EIB has three lending requirements for adaptation projects. First, the project must have a context of climate vulnerability, and must consider both the impacts as well as climate variability-related risks. Second, it must include a statement of purpose or intent to address or improve climate resilience to differentiate between adaptation to current and future climate change and normal good practice. Finally, the project must be linked to a context of climate vulnerability, which could include socio-economic or ecological vulnerability, and must

³⁴⁰ IPCC, 2014: Summary for policymakers. In: Climate Change 2014: Impacts, Adaptation, and Vulnerability. Part A: Global and Sectoral Aspects. Contribution of Working Group II to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change [Field, C.B., V.R. Barros, D.J. Dokken, K.J. Mach, M.D. Mastrandrea, T.E. Bilir, M. Chatterjee, K.L. Ebi, Y.O. Estrada, R.C. Genova, B. Girma, E.S. Kissel, A.N. Levy, S. MacCracken, P.R. Mastrandrea, and L.L. White (eds.)]. Cambridge University Press, Cambridge, United Kingdom and New York, NY, USA, 5.

³⁴¹ HELCOM “Baltic Sea Environment Proceedings No. 137 Climate change in the Baltic Sea Area HELCOM thematic Assessment in 2013.” 28-37. Accessed January 31, 2018. <http://www.helcom.fi/Lists/Publications/BSEP137.pdf>.

³⁴² EIB, “EIB Climate Strategy,” accessed 31 January 2018. http://www.eib.org/attachments/strategies/eib_climate_strategy_en.pdf.

³⁴³ EIB, “Economic Appraisal of Investment Projects at the EIB.” pp. 24-27, accessed 19 February 2018.

http://www.eib.org/attachments/thematic/economic_appraisal_of_investment_projects_en.pdf.

³⁴⁴ EIB, “EIB Climate Strategy,” accessed 31 January 2018.

contribute directly to climate resilience.³⁴⁵ If a climate adaptation project is to receive any funding by the EIB, it must include these three lending requirements in order to be eligible.

Potential EIB Project area for the BSR

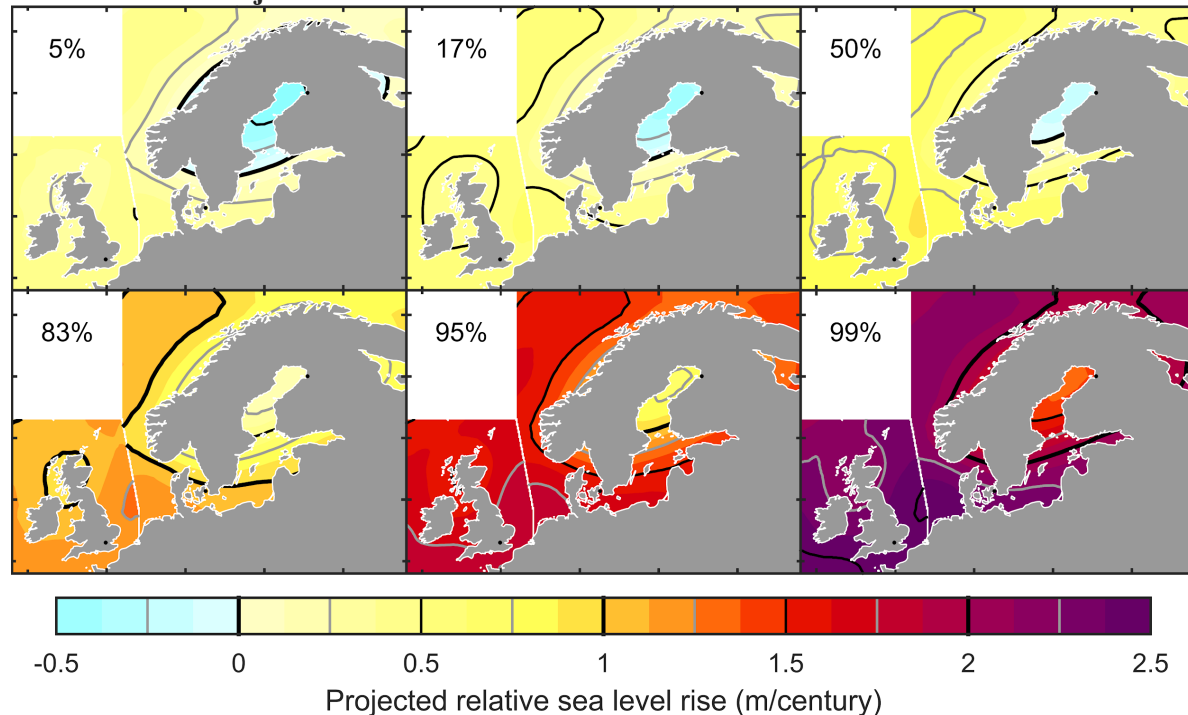


Figure 4: Projected Sea-level rise by 2100 based on Representative Concentration Pathway (RCP) 8.5, using six uncertainty Percentiles, with 50% median projection considered the best estimate.³⁴⁶

Sea-level Rise

Currently the regions of the Baltic Sea that are most vulnerable to sea-level rise are low-lying coasts. In Estonia, beaches are shrinking due to increases in storm frequency and storm surges. In Kaliningrad, beaches have been steadily eroding, and bay areas have seen erosion from 5-40 meters. Lithuanian beaches are slowly disappearing due to greater storms surges. Coastal retreat in Poland by storm surges are also causing dune erosion.³⁴⁷ Denmark is especially concerned with coastal erosion and flooding due to greater storm surges as a result of sea-level rise. Denmark has set forth a comprehensive strategy for sea-level rise adaptation.³⁴⁸ For coastal erosion of beaches regular sand nourishment is an effective and necessary countermeasure. Another countermeasure to coastal erosion and flooding is to reinforce sand dunes and dikes. This is relatively easy construction-wise and is feasible for individual landowners as well. Dike reinforcement must take into account the lifetime of individual dikes and whether or not reconstruction of dikes is a better means to counter coastal erosion and greater storm surges than

³⁴⁵ EIB, "EIB Climate Action, List of Eligible Sectors and Eligibility Criteria," accessed 31 January 2018. http://www.eib.org/attachments/strategies/climate_action_lending_eligibility_list_en.pdf.

³⁴⁶ Grinsted, Aslak, Svetlana Jevrejeva, Riccardo Riva, and Dorthe Dahl-Jensen, "Sea Level Rise Projections for Northern Europe under RCP8.5," *Climate Research*, Vol 64: 15-23, 2015, accessed 20 February 2018. http://www.int-res.com/articles/cr_oa/c064p015.pdf.

³⁴⁷ HELCOM "Baltic Sea Environment Proceedings No. 137 Climate change in the Baltic Sea Area HELCOM thematic Assessment in 2013." 48 Accessed January 31, 2018. <http://www.helcom.fi/Lists/Publications/BSEP137.pdf>.

³⁴⁸ UNFCCC, "Danish Strategy for Adaptation to a Changing Climate," accessed 21 February 2018.

<http://www4.unfccc.int/nap/Documents%20NAP/Adaptation%20Strategies%20and%20Plans/Danish%20Strategy%20for%20Adaptation%20to%20a%20changing%20Climate.pdf>.

a return to natural ocean barriers like sand dunes.³⁴⁹ Denmark's strategies towards sea-level rise can be implemented and adopted by other states in BSR whose coastlines are especially at risk.

Adopting these strategies for other states in the BSR requires funding. The EIB can provide loans for coastal sea-level rise adaptation measures so that the most vulnerable states in the region, like the low-lying coastal regions of Estonia, Lithuania, and Poland, have available access to resources. A BSR Sea-level adaptation project would specifically entail increased sand dune replenishment from coastal erosion, reinforcement of dikes and other coastal barriers in urban areas, and ensure strict construction requirements for projected sea-level rise and storm surge by the end of the 21st Century. This kind of project would fulfill all of the EIB lending requirements listed above and would provide the resources these vulnerable states need in order to safeguard their future.

Combatting Baltic Eutrophication

Beyond the looming risks of climate change, eutrophication further threatens the structure and function of the Baltic Sea's delicate marine ecosystem. The Baltic Sea is particularly susceptible to eutrophication due to its variable salinity amongst the Sea's sub-basins, limited water exchange between the North Sea and Skagerrak strait, and vertical stratification of the water masses.³⁵⁰ The unique geographic features of the Baltic Sea mean that once pollutants are introduced into the environment, they are either trapped in the sea basin, or take several decades to be diluted.³⁵¹

Human caused eutrophication has been an area of concern since 1974, when the members of HELCOM first assembled to address the growing threat of eutrophication.³⁵² Large-scale eutrophication results in "murky water owing to blooms of planktonic algae, mats of macroalgae at shores, reduced distribution of benthic habitats... and oxygen depletion resulting in the death of benthic animals and fish."³⁵³ Protecting and improving biodiversity of the Baltic Sea ensures that fishermen have healthy fish to catch, that Baltic shores remain clean and beautiful, and that the complex systems of life along the Baltic coast are preserved and kept in balance.

Nitrogen and phosphorus are the main nutrients causing eutrophication in the Baltic Sea. Although these are naturally occurring nutrients, they are being placed into the environment in artificially large amounts due to a variety of human activities, including transportation, combustion of hydrocarbons, human waste water, and agricultural runoff.³⁵⁴ While there have been efforts to try and mitigate this runoff, the presence of large meat-producing farms along the

³⁴⁹ UNFCCC, "Danish Strategy for Adaptation to a Changing Climate," accessed 21 February 2018.

³⁵⁰ HELCOM. *Eutrophication in the Baltic Sea - An integrated thematic assessment of the effects of nutrient enrichment and eutrophication in the Baltic Sea region*, 2009, Balt. Sea Environ. Proc. No. 115B, 8.

³⁵¹ HELCOM. *Eutrophication in the Baltic Sea - An integrated thematic assessment of the effects of nutrient enrichment and eutrophication in the Baltic Sea region*, 2009, Balt. Sea Environ. Proc. No. 115B, 10.

³⁵² HELCOM. *HELCOM Baltic Sea Action Plan*, 15 November 2007, Extraordinary Ministerial Meeting of the Helsinki Commission.

³⁵³ HELCOM. *Eutrophication in the Baltic Sea - An integrated thematic assessment of the effects of nutrient enrichment and eutrophication in the Baltic Sea region*, 2009, Balt. Sea Environ. Proc. No. 115B, 11.

³⁵⁴ Bartnicki, Jerzy, and Anna Benedictow. "Contributions of Emissions from Different Countries and Sectors to Atmospheric Nitrogen Input to the Baltic Sea Basin and Its Sub-Basins." Technical Report. EMEP/MSC-W Report for HELCOM. Oslo, Sweden: Meteorological Synthesizing Centre-West (MSC-W), January 2017.

Baltic Sea,³⁵⁵ in combination with high levels of artificial fertilizer used in plant-producing farms, plus unequal enforcement of established regulations to treat human waste water, all contribute to the continued eutrophication of the Baltic Sea. Each of these activities either releases pollutants into the atmosphere, or pollutes groundwater sources with phosphorus and nitrogen, both of which eventually make their way to the Baltic Sea.

Countries along the Baltic Sea have previously pledged to help mitigate eutrophication, as seen with the Baltic Sea Action Plan (BSAP), which include the goal of reducing the amount of phosphorus and nitrogen released in the Baltic Sea. HELCOM's vision for a Baltic Sea unaffected by eutrophication and in good environmental status include reaching the following objectives:

- Concentrations of nutrients close to natural levels,
- Clear water,
- Natural levels of algal blooms,
- Natural distribution and occurrence of plants and animals,
- Natural oxygen levels in the water.³⁵⁶

Obstacles in Preventing Eutrophication

One of the largest present challenges towards reaching BSAP goals and truly mitigating eutrophication is connecting polluters with resources and technology to abate phosphorus and nitrogen output. There are a variety of technologies that can reduce the amount of nutrients lost to waterways, however not all countries have access to necessary funding for these projects, and often times the largest polluters and industries are unwilling or unable to pay for the necessary modifications. The modifications necessary to implement these changes are costly, which disincentives countries from willingly making these environmentally focused changes.

While most Russian land does not border the Baltic, it is still a significant polluter of phosphorus and nitrogen into the Baltic Sea. Due to the current political climate, and its lack of EU membership, Russia does not have access to the same multilateral financial resources as other former Soviet countries along the Baltic Sea. Furthermore, the Russian government's regional target program for agriculture in Kaliningrad has "no direct support for environmental measures or investments" though measures such as the utilization of livestock waste could be within the parameters of the agricultural investment initiative.³⁵⁷

Belarus is another major contributor to Baltic Sea nutrient pollution, though it is neither in HELCOM nor an EU member. This means that while Belarus' pollutants end up in the Baltic Sea,³⁵⁸ it is difficult for any governmental body to demand better ecological practices without entering a bilateral or multilateral agreement directly with Belarus. Other EU countries also contribute to Baltic Sea nutrient pollution,³⁵⁹ but they are subject to EU regulations and initiatives. If Germany can make mitigating eutrophication of the Baltic Sea one of the EU's

³⁵⁵ Andersson, Kim, Maria Osbeck, Aliaksandr Pakhomau, Lubov Hertman, Kestutis Navickas, and Mikhail Ponomarev. "Pig Production in the Neman/Nemunas River Basin: A Study on Transboundary Measures, Institutional Capacity, Bio-Security and Local Development." Research. Stockholm, Sweden: Stockholm Environment Institute, December 1, 2013. <http://www.jstor.org/stable/resrep00535>.

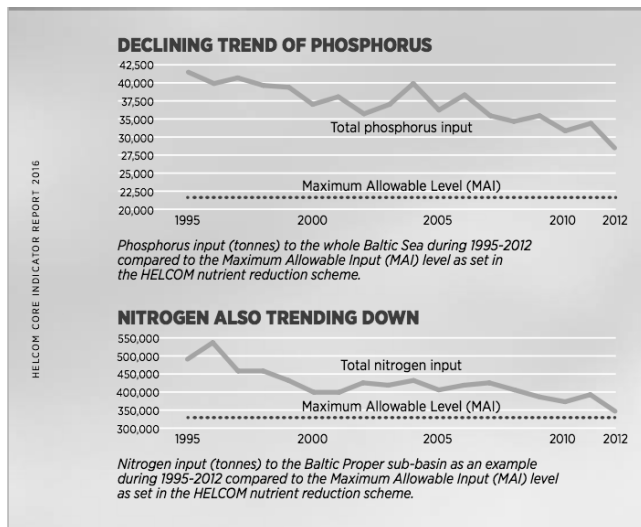
³⁵⁶ HELCOM. *HELCOM Baltic Sea Action Plan*, 15 November 2007, Extraordinary Ministerial Meeting of the Helsinki Commission, 7.

³⁵⁷ Andersson, Kim. "Pig Production in the Neman/Nemunas River Basin: A Study on Transboundary Measures, Institutional Capacity, Bio-Security and Local Development." Stockholm, Sweden: Stockholm Environment Institute, December 1, 2013.

³⁵⁸ Andersson, Kim. "Pig Production in the Neman/Nemunas River Basin: A Study on Transboundary Measures, Institutional Capacity, Bio-Security and Local Development." Stockholm, Sweden: Stockholm Environment Institute, December 1, 2013, 4.

³⁵⁹ HELCOM, "Updated Fifth Baltic Sea Pollution Load Compilation (PLC-5.5)," Baltic Sea Environment Proceedings No. 145, 2015, 18.

regional initiatives, this would be a huge step towards making other member states aware of their impact on this delicate sea's ecosystem.



Based on data from 1997-2003, HELCOM calculated ‘maximum allowable nutrient input (tonnes)’ and ‘needed reductions’ for each sub-region within the Baltic Sea, hoping to minimise nutrient output to “about 21,700 tonnes of phosphorus and 792,200 tonnes of nitrogen”³⁶⁰ to reach good environmental status, a burden that “shall be fairly shared by all Baltic Sea countries.”³⁶¹ Ultimately the goal was to reach these targets by 2021, and while both nitrogen and phosphorus output have decreased over the past ten years, the 2017 HELCOM report shows that the Baltic Sea countries will not hit the Maximum Allowable Inputs (MAI) within the desired time-frame without radical action at the national level.³⁶²

Clearly national actions are not adequately meeting the established criteria for nutrient abatement, indicating that there is ample room for trans-Baltic assistance and cooperation to meet the impending 2021 deadline. Furthermore, because HELCOM has adopted the United Nations’ 2030 Agenda for Sustainable Development Goals,³⁶³ the Commission is committed to longer-term goals which will take high levels of cooperation to accomplish. Germany has repeatedly demonstrated its support for mitigating climate change and supporting a healthy Baltic Sea. As a multilaterally engaged actor, it has previously recognized the value in international cooperation, especially in the context of human-caused environmental disasters, which would be the result of continued Baltic eutrophication.

Human Waste Nutrient Pollution

Agriculture and human waste water are two of the primary nutrient polluting sectors in the BSR.³⁶⁴ Wastewater treatment plants (WWTPs) are designed to eradicate harmful substances from households, enterprises, and urban runoff, and often strive to remove nutrients, pollutants, heavy metals and microorganisms.³⁶⁵ However, the extent to which each WWTP successfully abates these substances varies greatly, especially when it comes to abating nutrients, with some plants removing less than 30% of nutrients from incoming water.³⁶⁶ HELCOM requires at least 70-80% of nitrogen and 90% of phosphorus be removed from wastewater at WWTPs that service

³⁶⁰ HELCOM. *Updated Fifth Baltic Sea Pollution Load Compilation (PLC-5.5)*, Baltic Sea Environment Proceedings No. 145, 2015, 6.
³⁶¹ HELCOM. *HELCOM Baltic Sea Action Plan*, 15 November 2007, Extraordinary Ministerial Meeting of the Helsinki Commission, 8.
³⁶² HELCOM. *Measuring progress for the same targets HELCOM and UN Sustainable Development Goals*, 20 February 2017, 8.
³⁶³ HELCOM. *Measuring progress for the same targets HELCOM and UN Sustainable Development Goals*, 20 February 2017, 2.
³⁶⁴ Hautakangas, Sami, Markku Ollikainen, Kari Aarnos, and Pirjo Rantanen. “Nutrient Abatement Potential and Abatement Costs of Waste Water Treatment Plants in the Baltic Sea Region.” *Springer on Behalf of Royal Swedish Academy of Sciences* 43, no. 3 (April 2014): 352–60.
³⁶⁵ Hautakangas, Sami, Markku Ollikainen, Kari Aarnos, and Pirjo Rantanen. “Nutrient Abatement Potential and Abatement Costs of Waste Water Treatment Plants in the Baltic Sea Region.” *Springer on Behalf of Royal Swedish Academy of Sciences* 43, no. 3 (April 2014): 352–60.
³⁶⁶ Hautakangas, Sami, Markku Ollikainen, Kari Aarnos, and Pirjo Rantanen. “Nutrient Abatement Potential and Abatement Costs of Waste Water Treatment Plants in the Baltic Sea Region.” *Springer on Behalf of Royal Swedish Academy of Sciences* 43, no. 3 (April 2014): 352–60.

100,000 or more person equivalents,³⁶⁷ though rural areas have much lower abatement quotas. Unfortunately, countries have failed to completely satisfy this requirement, and phosphorus and nitrogen are polluting the Baltic Sea at higher levels than BSAP mandates.

Table 2 Estimates of current nutrient loads and reduction rates of existing WWTPs in the Baltic Sea countries and the proportion of the population not connected to the sewage treatment system in the Baltic Sea littoral countries

Country	Nitrogen		Phosphorus		Non-connected population (%) ^a
	Load (t a ⁻¹)	Abatement (%)	Load (t a ⁻¹)	Abatement (%)	
Denmark	2800	92	330	94	11
Estonia	1700	61	230	69	30
Finland	9700	60	110	97	20
Germany	1800	86	56	97	6
Latvia	2700	34	270	63	30
Lithuania	3500	65	360	75	43
Poland	66 000	49	8500	59	41
Russia	10 000	61	1300	74	50
Sweden	11 000	67	170	97	8
Total	110 000	61	11 000	75	–

^a Source COWI (2007). Individual values do not necessarily sum up to total due to rounding

Figure 5. Reduction of nutrient loads, 2007³⁶⁸

Cities and Larger Municipalities

Large cities and municipalities have the challenges associated with larger populations which produce both more trash and more wastewater. WWTPs which process 100,000 person loads or more in Germany and Denmark abate both phosphorus and nitrogen at high levels, while WWTPs in Finland and Sweden successfully abate phosphorus, yet fail to reach the 70% reduction rate of nitrogen desired. WWTPs in the Baltic Republics, along with Poland and Russia, still need to make significant improvements to their current wastewater treatment facilities to reach the appropriate targets. The primary issue in these areas is inefficient, out-of-date, Soviet-era equipment that has not been properly maintained, leading to massive inefficiencies.

Poland is a major contributor to the overall nitrogen and phosphorus loads released via wastewater into the Baltic Sea, and therefore has the greatest abatement potential. Germany should encourage Polish and EU investment in programs to bring large Polish WWTPs up to date with the best available technology for city waste management treatment systems which abate phosphorus and nitrogen at higher levels. Russia has expressed interest in these types of programs, and has given funding for the BEST initiative, indicating that this is a good place for collaboration moving forward.³⁶⁹

³⁶⁷ HELCOM. *Measuring progress for the same targets HELCOM and UN Sustainable Development Goals*, 20 February 2017, 14.

³⁶⁸ Hautakangas, Sami, Markku Ollikainen, Kari Aarnos, and Pirjo Rantanen. "Nutrient Abatement Potential and Abatement Costs of Waste Water

Treatment Plants in the Baltic Sea Region," Springer on Behalf of Royal Swedish Academy of Sciences 43, no. 3 (April 2014): 352–60.

³⁶⁹ "Better Efficiency for Industrial Sewage Treatment," Interreg Baltic Sea Region: Projects, October 2017, accessed January 2018. <http://projects.interreg-baltic.eu/projects/best-119.html>

Best Practices Highlights

Better Efficiency for Industrial Sewage Treatment (BEST)

Funded: October 2017 - September 2020 through Interreg³⁷⁰

Led by the Environment Center of the City of Helsinki, BEST seeks to slow eutrophication of the Baltic Sea by engaging municipalities and water utilities in achieving the nitrogen and phosphorus abatement goals established by HELCOM. A “Green List” will be created of cities and water utilities that are successfully abating nutrients, various waste treatment systems will be scientifically reviewed, while training and seminars will be organized in conjunction with the new collecting of wastewater data.³⁷¹

Rural Communities

The communities listed as ‘not-connected population’ are households not currently connected to any official wastewater treatment facility, and are primarily found in rural areas. Sometimes considered scattered settlements, these households are often difficult to access and in remote locations that make connecting them to a larger water treatment plant impractical. Human waste from rural areas is a large contributor to the ongoing eutrophication crisis facing the Baltic Sea, as their waste is not effectively treated, thereby allowing excess nutrients to leech into the groundwater and eventually into the sea.³⁷² Instead, they use septic tanks or simple separation tanks, which run a high risk of groundwater pollution, and do not abate nitrogen or phosphorus.³⁷³ This problem is particularly acute in this region, as many BSRs have large rural populations who are continuing to pollute the Baltic Sea through improperly treated human waste.

The EU has taken notice of this issue, specifically through the EU Water Framework Directive (2000/60/EC) and through its support of Interreg projects which target these regions. Several technologies have been developed to address the issue of rural waste, but the approach and technology must be appropriate for community needs, geography, and the amount that individuals are willing to invest, as these methodologies are not inexpensive. Potential options include holding tanks, where wastewater is held until it can be transported to and processed by a WWTP, septic tanks coupled with biofilters or aerobic systems which further abate nutrient pollutants, package plants, the most expensive option which are prefabricated waste treatment plants which “uses physical and biological processes to reduce contaminants in wastewater”³⁷⁴ including nitrogen and phosphorus.

Germany should encourage the establishment of a permanent fund within the EU to continue projects projects such as Village Waters and make better rural waste treatment systems affordable and accessible in order to increase phosphorus and nitrogen abatement from rural wastewater. Again, Poland is a major concern, as 14.7 million inhabitants live in rural areas and a mere 35.3% of that population is connected to a municipal WWTP, further compounding Poland’s issues concerning nutrient abatement.³⁷⁵ Germany should therefore focus its efforts within the EU towards aiding and encouraging the Polish government to update and renew its

³⁷⁰ “Better Efficiency for Industrial Sewage Treatment,” Interreg Baltic Sea Region: Projects, October 2017, accessed January 2018.

³⁷¹ City of Helsinki. “Project BEST (Better Efficiency for Sewage Treatment) - Summary,” *John Nurminen Foundation*, April 2015, accessed February 2018. <http://www.johnnurmisensaatio.fi/wp-content/uploads/sites/9/2014/07/Project-BEST-summary.pdf>

³⁷² Vorne, Virpi, and Frans Silvenius. “A Survey of Available Wastewater Treatment Technologies for Sparsely Populated Areas,” User’s Manual. Natural Resources Institute Finland (Luke), 2017.

³⁷³ HELCOM, “The Fifth Baltic Sea Pollution Load Compilation (PLC-5),” Baltic Sea Environment Proceedings No. 128, 2011

³⁷⁴ Vorne, Virpi, and Frans Silvenius. “A Survey of Available Wastewater Treatment Technologies for Sparsely Populated Areas,” User’s Manual. Natural Resources Institute Finland (Luke), 2017.

³⁷⁵ Vorne, Virpi, and Frans Silvenius. “A Survey of Available Wastewater Treatment Technologies for Sparsely Populated Areas,” User’s Manual. Natural Resources Institute Finland (Luke), 2017.

rural waste management. Russian rural homes and summer cottages are equally culpable, and Germany should continue to back Interreg programs which allow Russian investment and participation, especially those which focus on nutrient abatement from WWTPs.

Best Practices Highlights

Village Waters

Funded: March 2016 - February 2019 through Interreg

Village Waters seeks to provide resources to villages, rural homeowners, municipal authorities, and policymakers in the Baltic Sea Region to find effective wastewater treatment and equipment at affordable prices for homes that cannot be connected to a larger municipal wastewater treatment center. This program helps offset the initial costs of installing these new systems and ensures that the systems are the ‘best fit’ for the environment, usage, and needs of the homes and/or community. They provide:

- Comprehensive workshops;
- Expert support and advice;
- Community outreach and education;
- Publications of data and best practices discovered.

Figure 5. ³⁷⁶

Agricultural Waste Nutrient Pollution

Animal excrement

Livestock manure is a major source of ammonia nitrogen emissions from the BSR into the Baltic Sea, “which through atmospheric deposition results in airborne eutrophication and accounts for a major portion of the nitrogen entering the Baltic Sea”³⁷⁷. The ammonia and nitrogen lost from livestock production poses threats to ecological stability and human health in the region, as these nutrients form secondary particulate matter which are harmful to human health.³⁷⁸ Oftentimes manure is spread onto fields that are non-productive crop wise, leading to over-fertilization of this land,³⁷⁹ resulting in the increased leakage of nutrients into rivers, streams, groundwater, and eventually the Baltic Sea.

Mineral Fertilizers

To meet growing agricultural demands, EU crop-growing farmers have used mineral fertilizers to enhance the production of their crops. In 2015, EU-28 agriculture used 11.4 million tons of nitrogen fertilizer, and 1.1 million tons of phosphorus fertilizer.³⁸⁰ Nitrogen fertilizer is produced using natural gas, and phosphorus fertilizer is mined outside of the EU, and is therefore subject to high transportation costs.³⁸¹ Both fertilizers are susceptible to volatile oil market prices, creating instability for farmers, and are culpable for increased amounts of nutrients causing eutrophication in the Baltic Sea.

³⁷⁶ “VillageWaters Project,” VillageWaters, Interreg, March 2016, accessed January 2018. <https://www.villagewaters.eu/>

³⁷⁷ “Reducing nitrogen loss from livestock production by promoting the use of slurry acidification techniques in the Baltic Sea Region,” Interreg Baltic Sea Region: Projects, March 2016, accessed February 2018. <http://projects.interreg-baltic.eu/projects/baltic-slurry-acidi-34.html>

³⁷⁸ “Reducing nitrogen loss from livestock production by promoting the use of slurry acidification techniques in the Baltic Sea Region,” Interreg Baltic Sea Region: Projects, March 2016, accessed February 2018.

³⁷⁹ Andersson, Kim. “Pig Production in the Neman/Nemunas River Basin: A Study on Transboundary Measures, Institutional Capacity, Bio-Security and Local Development.” Stockholm, Sweden: Stockholm Environment Institute, December 1, 2013, 18-19.

³⁸⁰ “Agri-environmental indicator - mineral fertilizer consumption.” Eurostat: Statistics Explained. 20 December 2017, accessed February 2018. http://ec.europa.eu/eurostat/statistics-explained/index.php/Agri-environmental_indicator_-_mineral_fertiliser_consumption

³⁸¹ “Agri-environmental indicator - mineral fertilizer consumption.” Eurostat: Statistics Explained. 20 December 2017, accessed February 2018.

Russia ended subsidies to aid in the purchase of mineral fertilizers in 2013,³⁸² thereby promoting the usage of alternative fertilizers such as those produced from animal waste. The European Union's direct payment policy continues to support the purchase and application of mineral fertilizers,³⁸³ further perpetuating the spread of mineral fertilizers which contribute to the Baltic Sea's ongoing eutrophication. Germany, as a major agricultural hub and source of power within the EU, should support and promote projects within the EU which seek to end this practice of subsidising mineral fertilizers, instead focusing these funds on connecting phosphorus and nitrogen producers (livestock farms) with phosphorus and nitrogen consumers (crop farmers). This practice will simultaneously reduce the amount of animal waste that over-fertilizes fields while simultaneously decreasing the amount of mineral fertilizers needed to produce sufficient crop yields, and thus decrease the amount of phosphorus and nitrogen currently attributed to agricultural runoff. Utilization of and investment in new technologies, such as the Danish Slurry Acidification Technology (SAT), will help the BSR to safely transform manure into fertilizer, reducing the ammonia and nitrogen pollutants released into the Baltic Sea.³⁸⁴

Conclusion

Germany should aid and assist other states on a variety of topics, including infrastructure promotion, climate change support, and eutrophication mitigation measures to increase stability and security, reduce tensions, and improve cooperation between the Baltic Sea states. While these issues may not appear as pressing as the looming threat of Russian aggression, ecological and economic instability within the region will have long term consequences that cannot be undone. Climate change and eutrophication will work in tandem to destroy the unique beauty of the Baltic Sea. Only through comprehensive multilateral cooperation can the BSR adequately respond to the challenges that these ecological issues will present over the next few decades. By investing in Baltic tourism, infrastructure, and progressive environmentally sound technologies, Germany can demonstrate its confidence in the region and highlights its interest in the BSR's success. Furthermore, by adhering to GHG and nutrient output guidelines, Germany can serve as a better leader for the region, and truly live up to its reputation as a country that cares deeply about the ecologic future of our planet.

³⁸² Andersson, Kim. "Pig Production in the Neman/Nemunas River Basin: A Study on Transboundary Measures, Institutional Capacity, Bio-Security and Local Development." Stockholm, Sweden: Stockholm Environment Institute, December 1, 2013, 25.

³⁸³ Andersson, Kim. "Pig Production in the Neman/Nemunas River Basin: A Study on Transboundary Measures, Institutional Capacity, Bio-Security and Local Development." Stockholm, Sweden: Stockholm Environment Institute, December 1, 2013, 27.

³⁸⁴ "Reducing nitrogen loss from livestock production by promoting the use of slurry acidification techniques in the Baltic Sea Region." *Interreg Baltic Sea Region: Projects*, March 2016. Accessed February 2018.

Recommendations

Fund

- Promote Rail Baltica and help finance its completion
- Continue to fund and support Interreg, ensure that the projects are focused on responding to the ecological threats facing the region
- Encourage the European Investment Bank (EIB) to create a regional focus fund which responds to climate change's costs, including those regarding the mitigation of eutrophication

Enforce Pre-existing or Future Regulations

- Enforce total allowable catches for Baltic fishing
- Use the EU Climate & Energy Framework of reducing GHG Emissions in the EU member states by 40% of 1990 levels by 2030³⁸⁵ as a means to increase Environmental cooperation within the BSR.
- Encourage Russia to take concrete measures to achieve its long term goal of reducing GHG emissions by at least 50% below 1990 levels by 2050.³⁸⁶
- Develop and enforce better standards for measuring nutrient outputs from WWTPs and agricultural waste sites

Develop

- Create a unified brand for Baltic Tourism
- Establish and subsidize Baltic-wide programs that connect farmers' manure with crop farmers

³⁸⁵ European Commission, "2030 Climate & Energy Framework," European Commission, November 23, 2016. https://ec.europa.eu/clima/policies/strategies/2030_en.

³⁸⁶ "Climate Change Solutions: Frontline Perspectives from Around the Globe," *Yale Center for Environmental Law & Policy*, September 2014, accessed 31 January 2018. <http://climateobserver.org/wp-content/uploads/2014/09/Yale.pdf>

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