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THE EU SHOULD MERGE ENERGY AND ENVIRONMENTAL POLICY TO ACHIEVE ENERGY INDEPENDENCE FROM RUSSIA

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I. INTRODUCTION

Recently, Russia has seen considerable time in the international policy spotlight, sending shock waves throughout the international community with its military support during the para-military led annexation of Ukraine's Crimea peninsula in March.[1] The European Union's ("EU") energy dependence on Russia has hindered its ability to effectively execute sanctions against Russia for its bold and aggressive behavior.[2] These recent events underline the serious vulnerabilities of the EU's energy policy and demonstrate how energy dependence has translated itself into both economic and political dependence.[3] The EU should merge its energy and environmental policy together by abandoning its ineffective European Union—Emissions Trading System (EU-ETS) and adopt a Carbon Tax with Reinvestment (CTR), reclaiming its autonomy and ensuring the stability of its multinational economy, while simultaneously ensuring its ability to meet and exceed its Kyoto commitments.[4]

In this article, I begin by discussing the history of Russian and European foreign relations, focusing on the energy policy dynamics and their effect on these relations. I then examine how Russia's energy policy is a key element to its foreign relations strategy. Then, the implications of the EU's dependence on Russian natural gas are discussed, examining the seemingly conflicting interests between Europe's climate and energy security goals. Finally, I demonstrate how a

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1. *See* William W. Burke-White, *Crimea and the International Legal Order,* 4 SURVIVAL: GLOBAL POLITICS AND STRATEGY 65-80 (4th ed.2014).

2. *See* Chi-Kong Chyong & Vessela Tcherneva, *Europe's vulnerability on Russian gas*, EUROPEAN COUNCIL ON FOREIGN RELATIONS 1, 6 (Mar. 17, 2015) [hereinafter Chyong & Tcherneva].

3. *See id.*

4. *EU ver-achieved first Kyoto emissions target, on track to meet 2020 objective*, EUROPEAN COMMISSION: CLIMATE CHANGE, (Oct. 9, 2013), http://ec.europa.eu/clima/news/articles/news_2013100901_en.htm. EU emissions since 1990 have declined 18%, by 2020 the EU committed to reducing emissions by 20%. *Id.*

coordinated energy and environmental policy, using a carbon tax with reinvestment, can significantly reduce built environment emissions while reducing the EU's dependence on Russia; allowing the EU to address security, economic, and environmental concerns in a synergetic manner.

A. EU Energy History and Policy

The European Coal and Steel community was created under the Treaty of Paris.[5] Since the Treaty of Paris, Europe has held that energy policy integration is fundamental to its security and cohesiveness.[6] In 1973, the community would not only enlarge with three countries joining, but would also be faced with an energy crisis due to the Arab-Israeli war.[7] The EU was heavily dependent on foreign oil sources, especially from the Middle East, and still remains heavily dependent, importing over 90% of its oil and 66% of its natural gas.[8]Against this backdrop of European cooperation in energy security, I would like to examine Europe's current challenges with Russia and present my policy solution.

First, previous European energy securities must be considered. Energy security as a foreign policy issue has long involved issues much more profound than power generation and raw materials exchange.[9] As colonial powers, Europe, and then the U.S. companies, controlled and owned energy producing areas and facilities. These firms were named "The Seven Sisters."[10] This "first" period of energy producer consumer relations has since been replaced with the formation of OPEC in the 1960s, and the reclaiming of energy assets by energy producing nations.[11] This shifting dynamic has laid the foundation for energy policy being an issue of international diplomacy, as energy assets and other natural resources become symbolic of national power and autonomy.[12]

Europe (and the rest of the world) is now in a third period (identified by economic historians that is neither colonial-dominated by resource consumers, nor nationalistic-dominated by resource producers), an era that began

> with the dissolution of the Soviet Union, the spread of liberal values such as democracy and market economy and the empowerment of liberal international institutions. The liberalization of the energy sector, particularly in the EU, entails that energy has increasingly become

5. Raphaël Metais, *Ensuring Energy Security in Europe: The EU between a Market-based and a Geopolitical Approach,* EU Diplomacy Papers 3/2013 1, 3 (2013), https://www.coleurope.eu/sites/default/files/uploads/page/edp_3_2013_metais.pdf [hereinafter *Metais*].

6. *See id.* at 4–5.

7. *The History of the European Union*, EUROPEAN UNION, https://europa.eu/european-union/about-eu/history_en (last visited Nov. 6, 2016).

8. *Energy Security Strategy*, EUROPEAN COMMISSION: ENERGY, https://ec.europa.eu/energy/en/topics/energy-strategy/energy-security-strategy (last visited Nov. 6, 2016).

9. *See id.*

10. *The Secret of the Seven Sisters*. ALJAZEERA (Apr. 26, 2013, 1:12 PM), http://www.aljazeera.com/programmes/specialseries/2013/04/201344105231487582.html.

11. *See id.*

12. *See id.*

> subject to the logic of free markets. These last years, however, producing countries have increasingly resorted to political consideration in the management of energy.13

EU Energy trends have thus been marked by a post-World War II pattern of integration and liberalization.[14] During this period of liberalization, modern day Russia was still part of the Union of Soviet Socialist Republics ("USSR"), which might have contributed to asymmetric attitudes between Europe and Russia, especially with regards to energy policy.[15] Liberalization implies that firms have autonomous control over resources, thereby creating a framework by which governments have less ability to manipulate either the consumption or production of energy resources for geopolitical purposes.[16] The EU has been much more liberal and decentralized regarding their energy policy than Russia, by allowing the development of national but independent publicly traded companies that pursue their own economic interests, not solely those of the State.[17] This is partially due to political economic tradition, but also due to Russia being a sovereign government, whereas the EU is a collaborative union of many governments.[18] I will be discussing a united policy for the EU as a single, empowered policy actor, and, therefore, will begin with a more detailed historical analysis of the EU's energy policies, beginning in 1990. Since 1990, the EU and surrounding areas have sustained an economic growth rate of roughly 2% GDP per capita.[19] Energy intensive sectors (industries that require very high energy consumption to sustain output) have grown at a slower rate than the economy overall, causing the energy sector to grow at a correspondingly slower rate.[20] Regardless, economic growth has sustained a clear growth in the aggregate energy needs of the EU.[21] This conclusion is illustrated by the steady rise in imported energy over the past 25 years.[22] The European Commission projects this reliance to increase at an alarming rate, with the EU importing over 67% of their energy supply by 2030.[23] Thus, Europe faces significant structural pressure to obtain energy security via greater leverage in securing supply abroad, create a strategy to decrease imports via better production at home, or implement policies that work towards both of these objectives.[24]

The modern era of European energy policy can be defined by the EU's

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13. Metais, *supra* note 5, at 5.
14. *See id.* at 12–14.
15. *See id.* at 18.
16. *See id.*
17. *See* NEVEN MIMKA, EMPOWERING DEVELOPMENT DELIVERING RESULTS IN THE DECADE OF SUSTAINABLE ENERGY FOR ALL, 5–6 (European Commission, ed., 2015).
18. *Id.* at 5.
19. *See* EUROPEAN COMM'N DIRECTORATE-GENERAL FOR ENERGY AND TRANSP., EUROPEAN ENERGY AND TRANSPORT: SCENARIOS ON KEY DRIVERS, 36 (2004).
20. *See id.*
21. *Id.*
22. *See id.* at 26.
23. *See id.*
24. *See id.* at 135.

commitments to lowering CO_2 emissions, which has been a defining factor in its modern energy policy approach.[25] This commitment has made several EU countries leaders in producing energy that does not emit carbon, carbon equivalents, or other environmentally detrimental emissions.[26] However, this commitment is also one of the major forces driving Europe to import energy sources.[27] An integrated approach throughout the EU is crucial to success in energy security.[28] The EU must either import less energy or demonstrate that it is capable of importing less energy if it is to achieve energy security while also strengthening its standing in international policy. Research in energy economics and foreign policy can be utilized to illustrate that this is the case.[29]

1. European Natural Gas Consumption

Collectively, the EU member states are the world's largest energy importer, importing about 55% of their energy supply.[30] The EU imports approximately 64% of its natural gas in order to reduce its carbon dioxide and greenhouse emissions.[31] These imports are not simply for convenience or price, for only a handful of European states could cope with a disruption of this supply economically.[32] The European Commission forecasts that the EU will import over 80% of its natural gas needs by 2030.[33] Russia remains one of Europe's most important natural gas suppliers, accounting for 41% of European gas imports in 2013,[34] and with several countries importing over 80% of their Natural Gas from Russia.[35] With projections of increased natural gas consumption, coupled with the decline of domestic natural gas production,[36] the EU's dependence on Russia as a supplier can only be expected to grow unless policy actions reverse this dependence.

Today, twelve EU member states depend on Gazprom, the state-run Russian

25. *See* EUROPEAN COMM'N, EUROPEAN ENERGY AND TRANSPORT: SCENARIOS ON KEY DRIVERS 12 (2015) [hereinafter *Renewable energy progress report*].

26. *Id.* "Green", "renewable" or "clean" energy" are common ways of referring generally to various technologies that can produce energy without significant environmental harm and resource depletion.

27. *Id.*

28. *See* Metais, *supra* note 5.

29. *Id.*

30. *See* EUROPEAN COMM'N, EUROSTAT STATISTICS EXPLAINED 1 (Jul. 2016), http://ec.europa.eu/eurostat/statisticsexplained/index.php/Energy_production_and_imports#Furthe_Eurostat_information [hereinafter *Eurostat Statistics Explained*].

31. *Id.*

32. *See* Chyong & Tcherneva, *supra* note 2.

33. EUROPEAN COMMISSION, European Energy and Transport: Trends to 2030 – update 2005, at 27 (2006).

34. *See Eurostat Statistics Explained, supra* note 30.

35. *See* Chyong & Tcherneva, *supra* note 2 ("[t]he Central and East European countries still import a large proportion of their natural gas from Russia: Hungary imports around 89 percent of its annual consumption from Russia; Poland imports 53 percent (2013); the Czech Republic, 99 percent; and Slovakia, 95 percent.").

36. *See* Chyong & Tcherneva, *supra* note 2.

natural gas producer, for more than half of their natural gas consumption, and in some cases, they are entirely dependent.[37] Europe's glaring dependency has been a concern for decades, but the current political crisis in Ukraine has accentuated the urgent need for Europe to diversify its energy sources, particularly in respect to natural gas.[38] As I discussed above and will explore further below, Gazprom is an example of a mechanism through which the state in an energy producing country obtains greater control of resource production to use as a foreign policy tool.

Gazprom dominates Russia's upstream (the exploration and production of natural gas) and downstream (marketing and distribution), with over $106 billion USD in revenue, even when geo political conflict begins to affect the revenue flow.[39] This significant influx of cash has given President Putin significant leverage both domestically and internationally.[40] The State Owned Enterprise ("SOE") is more than willing to participate actively in accordance with Putin's interests.[41] There are many examples of Gazprom using shutdown threats as a policy tool.[42] EU policy in the early 1990's was to help Russia increase exports;[43] however, this policy would make the EU more dependent despite its dominance of Russian gas production.[44] Gazprom has not been the most reliable partner for Europe, as Gazprom has been accused of being nontransparent about its abilities to sustain exports and commitments to improve infrastructure.[45] Despite these shortcomings, there is no reason to think Gazprom will stop growing, as it begins to seize significant development opportunities in Central Asia.[46] As the graphic below shows, the natural gas consumption of Europe implies that Gazprom and all Russian natural gas producers represent a vital piece of this discussion.

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37. *See id.*

38. *Id.*

39. *See Gazprom's net profits down sevenfold in '14 on conflict in Ukraine*, CHINA POST (Apr. 30, 2015), http://www.chinapost.com.tw/business/company-focus/2015/04/30/434792/Gazproms-net.htm.

40. *See* Quinten Parret, Whither Gazprom? The EU and Russia's gas, LA REUVUE GEOPOLITIC, (Nov. 1, 2007), http://www.diploweb.com/Whither-Gazprom-The-EU-and-Russia.html [hereinafter *Parret*].

41. *Id.*

42. Andrew Monaghan, *EU Energy Cooperation, in* EU RUSSIA CENTRE, THE EU-RUSSIA REVIEW 29 (2006).

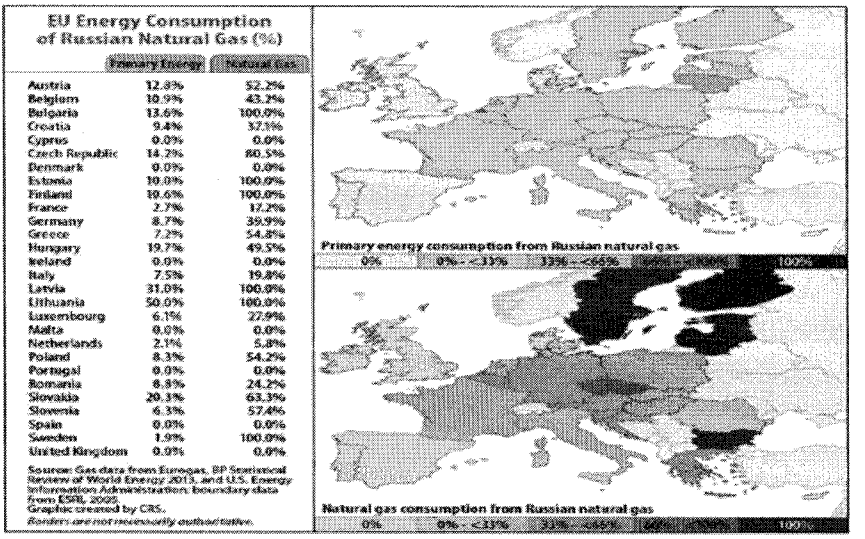
43. I participated on a European Bank for Reconstruction & Development (EBRD) project to provide Russia with over $1 billion in funding to expand natural gas exports to the EU to increase Russia's ability to earn foreign exchange following its economic collapse from 1989 to 1994. The author, who worked as a financial specialist, modeled gas exports and Russian tax collection to show the viability of the expansion and worthiness of the loan package to support the Yeltsin government.

44. Monaghan, *supra* note 42, at 29.

45. *See id.*

46. *See id.*

Figure 1: EU Dependence on Russian Natural Gas[47]



Source: CRS Graphics compiled this graphic.

Notes: For primary energy, which is the base source of energy used to produce electricity and perform other work, Russian natural gas does not comprise greater than 50% for any EU country.

The EU's reliance on Gazprom and other Russian exporters is only expected to increase, as several EU countries try to reduce emissions by shutting down coal plants and replacing them with natural gas imports.[48] Coal is one of the highest emitting energy sources per unit of energy, and in several European countries energy consumption is nearly 30% coal.[49] It should be noted that Poland, one of these coal dependent countries, is creating its own natural gas infrastructure, thus providing an example of a European power beginning to replace natural gas imports.[50] By definition, this can only come with significant investment. Thus, via Gazprom, the Russian state has retained significant control of its natural resource base, and via European reliance on natural gas, has retained significant influence over EU-Russian relations.

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47. MICHAEL RATNER ET AL., CONG. RESEARCH. SERV., R42405, EUROPE'S ENERGY SECURITY: OPTIONS AND CHALLENGES TO NATURAL GAS SUPPLY DIVERSIFICATION 10 (2013).

48. *See* Chyong & Tcherneva, *supra* note 2 ("In addition to the member states already dependent on Russian gas, in a few others, coal consumption dominates the energy mix. If European climate policy is effective in driving these member states to reduce CO2 emissions by diversifying away from coal consumption, then their exposure to natural gas supply security will grow: gas is likely to be the next fuel of choice because of its relative competitiveness when compared to other low-carbon energy sources (renewables, coal with carbon capture and storage, nuclear and so on). This could apply to Estonia, Poland, Czech Republic, and Bulgaria.")

49. *See id.*

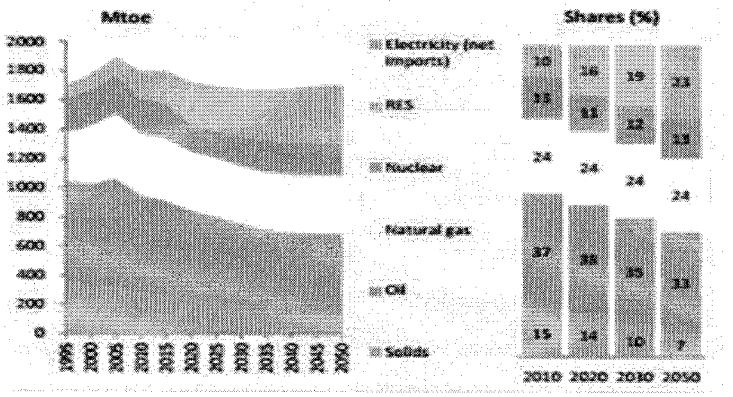
50. *See id.*

2. EU Energy Production

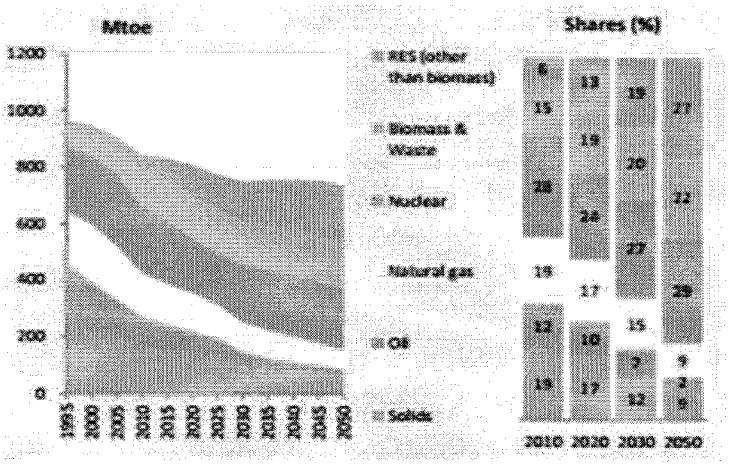
As shown in Figure 2, the EU expects to reduce fuel and gas based production significantly, due to better climate policy and advancements in clean technology.[51]

Figure 2: European Energy production and consumption, historical and projected to 2030[52]

Primary Energy Supply



Primary Energy Production



51. *See* P. CAPROS ET AL., EU ENERGY, TRANSPORT AND GHG EMISSIONS TRENDS TO 2050, at 49 (ed. European Commission 2013) [hereinafter *Emissions Trends*].

52. *See id.*

This commitment to advancement in clean technology is demonstrated by the projections, as renewable energy sources are the only energy sources projected to continue to grow.[53] Concerns about Nuclear energy in the wake of Fukushima have dampened prospects for growth in Nuclear energy production.[54] Increased security protocols and a united European effort will need to be established if nuclear energy is going to play a role in Europe's future.[55] The previous figure shows that traditional sources of (carbon) energy with high levels of emissions are still a large part of the total energy-mix (supply and demand for energy), so the EU still must find a way to continue to increase investment rates in clean energy.[56] Despite major advancements in clean energy, natural gas (both local and imported) will be crucial to European energy demand without significant shifts in policy.[57]

The EU is a leader in the field of clean energy.[58] The EU has excelled at producing clean energy and cutting emissions, producing 39% of the world's clean energy.[59] While impressive, the growth in this industry is starting to taper out in Europe, with key countries falling below the global average.[60] Therefore, the EU has a strong incentive to consider trade policies that will keep its energy intensive industries competitive.[61] Europe has already begun to attempt to consider these trade policies, but these considerations have been met with fierce opposition.[62] The EU's ability to raise revenue from carbon energy taxes, in order to pay for its clean energy programs, is uncertain under current policy.

The European Commission has been transparent in its energy production projections, under which production that occurs in Europe is expected to slowly decrease, with production from high emissions sources shrinking more rapidly than green energy sources.[63] Reliance on energy imports, including natural gas and oil imports from Russia will continue to increase as European oil and natural gas fields face natural production decline.[64] Therefore, while Europe exhibits unique strengths as an energy producer, there are significant concerns about energy security that I believe are directly related to its environmental policy resulting in a complicated foreign policy and relationship with Russia, given Russia's oversized

53. *See id.*

54. *See id.* at 11, 18–19.

55. *See id.* at 11, 18-19, 45.

56. *See id.* at 49.

57. *See id.*

58. *Id.*

59. *See BP Statistical Review of World Energy June 2016,* at 39, BP, bp.com/statisticalreview#BPstats (last visited Dec. 8, 2016) [hereinafter BP].

60. *See id. at* 5.

61. *See* Frédéric Branger & Philippe Quirion, *Would border carbon adjustments prevent carbon leakage and heavy industry competitiveness losses? Insights from a meta-analysis of recent economic studies,* 99 Ecological Economics 10 (2014).

62. *See* Scott Barrett, *Rethinking Climate Change Governance and its Relationship to the World Trading System,* 20 THE WORLD ECONOMY 1863, 1864 (2011).

63. *See Emissions Trends, supra* note 51, at 17.

64. *See id.*

importance as a provider of oil and natural gas to the EU.[65] These concerns are significant and involve the fundamental structural dynamics of the modern EU.

3. Russian "Energy Diplomacy"

There are significant concerns about infrastructure and cooperation, but the fact remains that Russia has over twenty times the gas reserves that the EU does.[66] Geography has forced Europe and Russia to cooperate for the better part of the last century, dating long before Russia was considered a capitalist democracy.[67] The structure of these exports hasn't changed much; one expert notes that "[e]ver since Soviet times, Russian gas production has been relying on three large gas condensate fields at Urengoy, Yamburg and Medvezhe, in North-Western Siberia."[68] Whereas the structure of most energy relationships can shift rapidly, the way natural gas is exported implies a slow evolution in its export stats.[69] While the EU continues its heavy investment in clean energy, despite the lackluster reaction from the rest of the world,[70] it faces increased challenges in securing natural gas, a vital part of its energy mix.[71] Unlike oil, which is fungible in the international marketplace and can easily be shipped by tanker from one location to another, most of the EU's gas imports are by pipeline, making them non-fungible, because they cannot easily move the pipeline to replace them.[72] Thus, if there is a problem with the supplier, it is difficult to quickly source natural gas from another region. Approximately half of all the natural gas that Russia ships to the EU goes through the Ukraine via pipeline.[73] Threatening to terminate or alter gas exports as a method of coercing various actors, termed the "tap weapon",[74] is a serious issue for the EU. Russia has twice leveraged its vast natural gas resources as a diplomatic weapon, shutting off gas to Ukraine amid trade disputes in 2006 and again in 2009 during the winter months, months where natural gas consumption is highest due to its use as a heating fuel and storage is declining.[75] On each

65. *See* Chyong & Tcherneva, *supra* note 2.

66. *See* Metais, *supra* note 5, at 7.

67. Kenneth Rapoza, *Russia Welcomes Capitalism . . . Again*, FORBES (Apr. 18, 2011, 08:24 PM), http://www.forbes.com/sites/kenrapoza/2011/04/18/russia-welcomes-capitalism-again/#318e45ae1318.

68. *See Parret*, *supra* note 40, at 6.

69. *See id.* at 5.

70. *See Worldwide Electricity Production from Renewable Energy Sources Online Database*, EUROBSERV'ER, http://observer.cartajouronline.com/Interface_Standard/cart@jour.phtml?NOM_PROJET=barosig&NOM_USER=&Langue=Langue2&Login=OK&Pass=OK.

71. *Id.*

72. *See* BP, *supra* note 59, *at* 28.

73. *See* Maria Galluci, *Europe Unprepared if Russia Cuts Off Natural Gas Exports to EU this Summer, Analysts Say*, IBT (Jul. 7, 2014, 9:30 PM), http://www.ibtimes.com/europe-unprepared-if-russia-cuts-natural-gas-exports-eu-summer-analysts-say-1643986.

74. *See* Bertil Nygren, *Putin's Use of Natural Gas to Reintegrate the CIS Region*, 55 PROBLEMS OF POST COMMUNISM 3, 4 (2008).

75. *See* Mert Bilgrin, *Geopolitics of European natural gas demand: Supplies from Russia, Caspian and the Middle East*, 37 ENERGY POLICY 4482 (2009) [hereinafter *Bilgrin*].

occasion, Europe inevitably suffered the downstream consequences.[76] Rather than act to become energy independent from Russia, Europe has merely proposed alternate pipelines to bring the same Russian gas to the EU.[77]

The relationship between the EU and Russia is not a simple issue for the Kremlin to deal with either. Russia's exports of natural gas ($73 billion USD) and oil ($283 billion USD) are a non-trivial asset, making up 68% of Russia's total export revenues in 2013.[78] The relationship between the EU and Russia is not a simple issue for the Kremlin to deal with either. Russia's exports of natural gas ($73 billion USD) and oil ($283 billion USD) are a non-trivial asset, making up 68% of Russia's total export revenues in 2013.[79] Natural gas imports could represent a major point of policy leverage if Europe could find alternatives, even if those alternatives came at a significant cost. Recent occurrences in Crimea serve to amplify the urgency of moving away from energy dependence on Russia,[80] which can only be accomplished by diversifying European energy sources and moving towards renewable energy.[81] The EU has expressed desires for a better integrated energy investment strategy, and is already a leader in renewable energy.[82] I believe Europe is poised to make great strides in energy security. Below I expand upon this relationship in depth.

a. Gas, the USSR, and Reagan

Despite deep tensions dating all the way back to the cold war, geographic proximity has made Russia a natural energy trading partner with the EU in terms of exporting natural gas. This set the stage for a complicated energy relationship between Russia and the EU. The EU and Russia's natural gas based economic relationship dates back to the early cold war, a significant twenty first century example being the 1964 "friendship" gas pipeline from the USSR to West Germany.[83] A significant amount of the infrastructure still used today to export gas to the EU from Russia dates back to some of the original pipelines built during the Soviet era in Russia.[84] These pipelines were created back in the early 80s,

76. *Id.*

77. *See Emissions Trends, supra* note 51, at 6.

78. *See* Alexander Metelitsa, *Oil and natural gas sales accounted for 68% of Russia's total export revenues in 2013,* US ENERGY INFORMATION ADMINISTRATION, http://www.eia.gov/todayinenergy/detail.cfm?id=17231.

79. *See* Alexander Metelitsa, *Oil and natural gas sales accounted for 68% of Russia's total export revenues*
in 2013, U.S. Energy Information Administration (Oct. 3, 2016, 9:30 AM), http://www.eia.gov/todayinenergy/detail.cfm?id=17231.

80. *See* Chyong & Techerneya, *supra* note 2; *see also* Bilgrin, *supra* note 75.

81. *See* Chyong & Techerneya, *supra* note 2.

82. *See* BP, *supra* note 59, at 5.

83. *See* Peter Rutland, *Russia as an Energy Superpower,* 13 NEW POLITICAL ECONOMY 203, 205 (2008).

84. *See* Vasily Astrov, *Current State and Prospects of the Russian Energy Sector,* 363 THE VIENNA INST. FOR INT'L ECON. STUD.: RESEARCH REPORTS 1, 17 (2010).

despite protests from the Reagan administration that caused tensions between all 3 actors.[85]

Natural gas is a more diplomatically complicated good to trade than other assets, as the transfer infrastructure for this good (pipelines) are stagnant, capital intensive, and exclusive to the good itself, unlike the transfer infrastructure for most other goods, which returns to the origin source (ships, planes, and trains).[86] It is therefore difficult to replace partners (for both producers and consumers).[87] Reagan explicitly mentioned the possibility of Soviet "blackmail", using threats to gas supply as a reason not to build the pipelines as proposed,[88] similar to the tap weapon. The EU and Russia both felt the Reagan administration was imposing national U.S. interests and legal precedents in a territory that did not belong to them.[89] Experts suggested trying to create a true regional consensus at the time, while the U.S. wanted to pursue a harder line with the then USSR.[90] What emerged was a solution somewhere in between, as the USSR became a complicated Russian democracy with the state still playing a large role in the energy market.[91]

b. Post-Soviet Russia

Following the collapse of the USSR, and the creation of Russia under President Yeltsin, Yeltsin proceeded to privatize as much of Russian industry as possible.[92] This was done by issuing vouchers and distributing them to 144 million people.[93] By the end of 1994 Russia had managed to transfer ownership of seventy percent of large and medium-sized companies and ninety percent of small companies.[94] Gazprom was never privatized, although some shares were sold on domestic and international markets to place a value on the firm.[95] However, control of energy supplies never experienced real independence from the state, under and after Yeltsin, and Gazprom emerged as the state supported giant and foreign policy tool in the wake of the dissolution of the USSR.[96] Gazprom joined several SOEs in providing energy infrastructure for cheap or free to struggling parts of the Russian economy in exchange for tax breaks, causing them to act more like a state

85. Harold Maier, *Interest Balancing and Extraterritorial Jurisdiction*, 31 AM. J. OF COMP. LAW 579, 580–81 (1983).

86. *See* Metais, *supra* note 5, at 6.

87. *See id.*

88. Maier, *supra* note 85, at 580.

89. *See id.* at 579–80.

90. *See id.*

91. *See id.* 486–86.

92. *Economic Reform in the 1990s, in* RUSSIA: A COUNTRY STUDY (Glen Curtis, ed., 1996), http://countrystudies.us/russia/.

93. See *id.*

94. See *id.*

95. See *id.*

96. *See* Daniel Treisman, *After Yeltsin Comes... Yeltsin,* 117 FOREIGN POL'Y 74, 76, 78–79 (1999–2000).

institution and less like a private enterprise.[97] These chaotic early years helped Gazprom establish deep ties in the Russian state.[98] This sort of practice is common in economies based on natural resources: Russia is far from alone in using SOEs to manage natural resources, as a way of centralizing investments in infrastructure and controlling energy exports for more effective diplomacy.[99]

When the USSR fell, there was a broad attempt to construct a stable democracy and embrace values that were considered foreign: democracy and capitalism.[100] This implementation in Russia and in other countries has been a definitive trend for the modern context of energy and foreign policy.[101] Of course, theory and implementation offer all sorts of difficulties. Countries attempting to transition to capitalist societies are often plagued with difficulties related to erasing cultural norms and controlling corruption, a post-soviet Russia was no exemption.[102] The balancing act between Russian values and a new system of democracy and capitalism, set to the aforementioned wealth of natural gas, created the problematic context of the current relationship between Russia and the EU, which is dissected below.

c. Putin's Russia

Current Russian President Vladimir Putin has initiated a reawakening of a sort of expansive, even imperialist, foreign policy by Russia, beginning with the controversial article "Russia at the Turn of the Millennium."[103] This article is often pointed to as the beginning of the post-Yeltsin era in which Russia is cast as a united and patriotic global force.[104] In this article, Putin implores Russia to rally around diverse concepts, from traditional Russian values to making Statism work within market mechanisms.[105] He distances himself from what at the time was recent Russian history, attacking the practicality of communism in no uncertain terms.[106] Regardless, Putin uses this work to set the stage for a much more aggressive, nationalistic approach to Russian foreign policy.

Putin has continued to pursue a united and powerful Russia. His presidency has overseen significant economic and social progress in Russia, which he attributes to his policies.[107] However, this growth was actually attained because

97. *See id.* at 78.

98. *See id.*

99. Metais, *supra* note 5, at 12.

100. *See id.* at 5.

101. *See id.*

102. *See* Treisman, *supra* note 96, at 58.

103. *See* Vladmir Putin, Russia at the Turn of the Millennium, *Nezavisimaia gazeta* (Dec. 30, 1999), http://pages.uoregon.edu/kimball/Putin.htm.

104. *See id.*

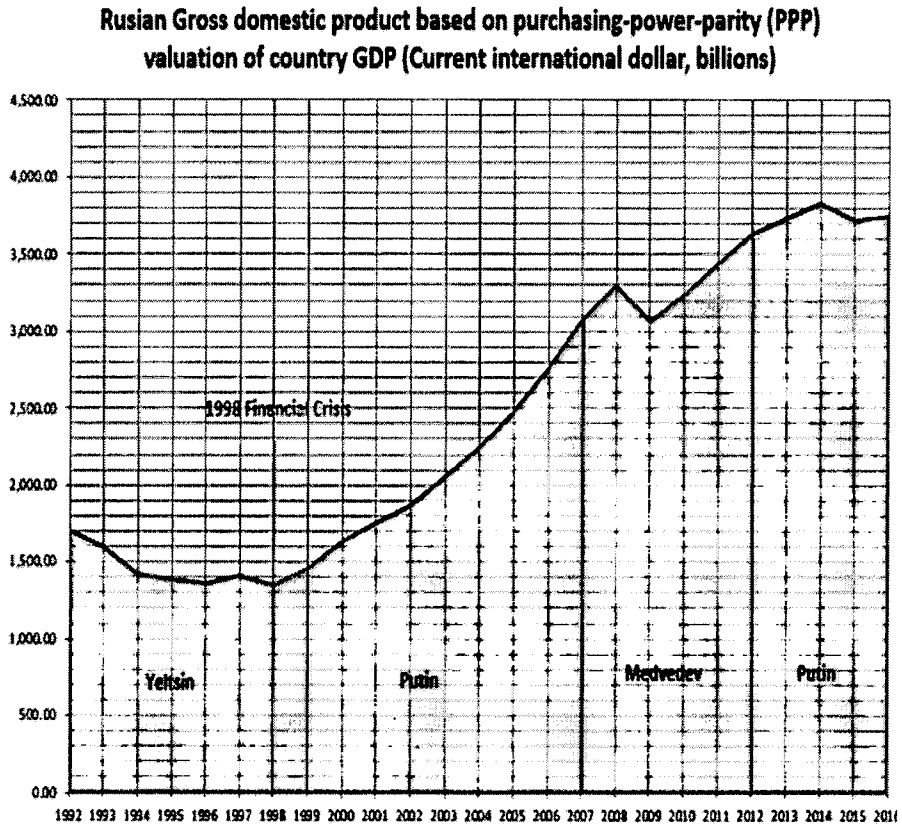
105. *See id.*

106. *See id.*

107. *See* Anders Åslund, *Russia's Economic Transformation under Putin*, 45 EURASIAN GEOGRAPHY AND ECONOMICS 6, 397–420 (2004).

of the rapid and sustained increase in the price of oil from 1998 to 2008 and its rapid recovery following the recession of 2008.[108]

Figure 3: Russian GDP 1992-2016[109]

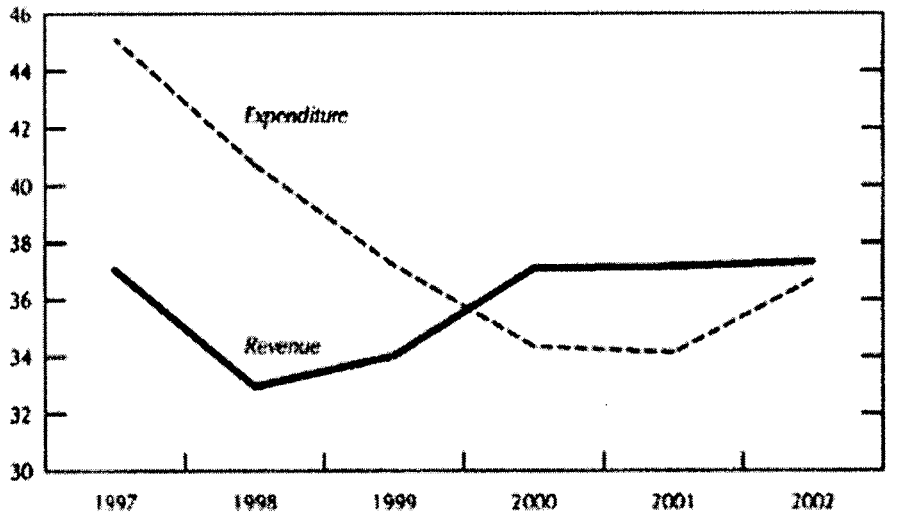


The default on debt followed by a rapid rise in oil prices helped reduce inflation and allow stability to return to the Russian economy as demonstrated in Figure 4 and Table 1.

108. *See id.* at 397–99.

109. Figure 3 was created by the author with information from INTERNATIONAL MONETARY FUND, imf.org (last visited Dec. 28, 2016).

Figure 4: Russian Government Revenue and Expenditure (Percent of GDP)[110]



Following the devaluation of 1998 the Russian government moved from deficit to budget surplus as shown in Table 1.

Table 1: Russia Key Monetary Indicators[111]

	1997	1998	1999	2000	2001	2002
			(Percent)			
GDP growth	1.4	5.3	6.3	10.0	5.0	4.3
Inflation (end of period)	11.0	84.5	36.6	20.1	18.6	15.1
Monetary growth[1]						
Target		2230	1826	2125	2734	2428
Outcome		20	57	62	40	32
International reserves (Billions of U.S. dollars)	17.8	10.9	12.4	27.9	34.5	47.8

Sources: Russian authorities; and IMF staff estimates.

[1]M2 from the Central Bank of Russia's "Basic Guidelines of State Integrated Monetary Policy" for relevant years.

110. *See Russia Rebounds*, INTERNATIONAL MONETARY FUND, (David Owen & David O. Robinson eds.), *available at* http://www.imf.org/external/pubs/nft/2003/russia/ (last visited Dec. 28, 2016).

111. *Id.*

Once President, Putin swiftly started implementing various reforms mentioned in his controversial article, building on the need for reform highlighted by the 1998 financial crisis and the political inertia toward sweeping reform that had already been established.[112] Many of the first and most important reforms were fiscal: Putin started by making large cuts in government expenditures deemed wasteful.[113] He also instituted highly praised tax reforms, including a flat tax and lower corporate taxes, which while controversial on a global scale appealed well to the context of corruption and excessive bureaucracy.[114] This tax reform included large taxes on natural resource companies, a move that could be interpreted as a strategy to weaken the independence to Russian oligarchs, ensuring more *de facto* political power stayed in the Kremlin.[115]

The economic and fiscal benefits of Putin's well implemented and opportunistic reforms has major political effects; major businessmen and corrupt officials that were well situated before reform lost significant political clout to the state.[116] Putin impressively managed to liberalize key sectors while increasing the power of the state.[117] However, it must be pointed out that the restructuring of key monopolies is not complete.[118] Putin's reforms, while substantial, seem to place a focus on keeping the state deeply involved in the management of natural resources, keeping these resources available as a foreign policy weapon.[119] This appears to correspond to Putin's philosophy as expressed in his writings that preceded his presidency.[120]

As detailed above, many of Putin's reforms have inarguable positive effects. Increased solidarity and support for Putin carries with it serious geopolitical implications, especially for energy security. Putin's history in the KGB and souring relationships between NATO and Russia at the time of his inauguration caused the relationship between Russia and the EU to become even more tense than before.[121] The distrust (or at least suspicion) between Putin and the EU, as detailed in the following section, was exacerbated by various economic and even military events.

Russia using its energy wealth to coerce its trading partners is neither simple nor objectively beneficial for long-term Russian interests, especially those of the Russian people. The effectiveness of natural resource control as a coercive force depends on the price of the resource.[122] In Russia's case, poor infrastructure

112. *See* Åslund, *supra* note 107.
113. *See id.* at 402.
114. *See id.* at 400, 404.
115. *See id.* at 400.
116. *See id.* at 401–02.
117. *See id.*
118. *See* Rutland, *supra* note 83, at 205.
119. *See generally* Harley Balzer, *The Putin Thesis and Russian Energy Policy*, 21 POST-SOVIET AFFAIRS 210 (2005).
120. *See id.*
121. *See* Rutland, *supra* note 83, at 204.
122. *See* Metais, *supra* note 5, at 20.

has limited Europe's faith in the reliability of Russian natural gas exports, as well as significantly damaging the potential economic benefits of these exports for all parties involved.[123] Regardless of this and other factors, as detailed below, Russia has shown itself willing to make the necessary sacrifices to use natural gas as a coercive policy tool to force Europe to not interfere with Russian interests, including political expansion that does not comply with international law.[124] Once this fact has been established, the proposed policy for European energy security will be deeply relevant to the context of European-Russian relations.

II. PUTIN AND IMPLEMENTATIONS OF RUSSIAN ENERGY DIPLOMACY

Vladimir Putin has made incredible strides in uniting Russian interests and various power players as detailed above. It has been detailed how deeply the administration's strategy of control is based on natural resource control.[125] Several important large players in Russian politics have been moved around with the intention of centralizing the management of natural resources.[126] This is indicative of how important natural resources are to Putin's governing style. How this relates to his way of relating with Europe is detailed below.

A. Russian Energy Superpower

Russia's principle upper hand in all negotiations is that the EU is involved in lies within its control of valuable natural resources, principally natural gas.[127] Russia is the world's leading natural gas producer, controls the export paths of many other large producers, and is highly ranked for several other energy commodities.[128] While other exports may be threatened in diplomatic breakdowns at some point, this work on European Energy Security will focus on natural gas, as it has been historically Russia's diplomatic weapon of choice.[129] Managing this resource has been difficult due to what political scientists and economists call the "resource curse", wherein managing single commodity can result in high corruption and mismanagement due to the relative value of the exported good.[130] Russia has also had to work at managing currency appreciation resulting from its resource endowment (known to some as "Dutch disease").[131]

Without observable examples of the aggressive aspects of Putin's philosophy, it might be argued that the defensive rhetoric of Putin was mostly to unite Russians and gain votes rather than to demonstrate his real intentions. Experience and data, however, do not support this interpretation, but show that Russia is at least willing to try and use its energy endowment to push various

123. *See* Astrov, *supra* note 84, at 17–18.
124. *See id.*
125. *See id.*
126. *See generally* Balzer, *supra* note 119, at 211.
127. Nygren, *supra* note 74, at 13.
128. *See* Rutland, *supra* note 83, at 203.
129. Nygren, *supra* note 74, at 5.
130. *See* Rutland, *supra* note 83, at 205–06.
131. *See* Rutland, *supra* note 83, at 206.

foreign policy agendas.[132] The tap weapon has been relevant since the 1990s, but has proven a much more serious threat under Putin.[133] While there are other nations that export gas in the region, pipelines that flow to Europe are almost always built through Russia, so they do not constitute alternative options in the case of a gas shutdown.[134] Two examples of Russia's willingness to use this strategy stand out in recent history: the conflicts and ensuing gas cut offs to Ukraine in 2006 and 2009.[135] These examples highlighted energy security as a need, something explicitly acknowledged by the European Commission.[136]

1. The Ukrainian Gas Crisis in 2006

Putin appointed a former Gazprom executive as ambassador to Ukraine in 2001, highlighting the deeply connected nature of Ukrainian-Russian relations and natural gas.[137] This could have solidified a very smooth relationship with the Ukrainian state, if the Ukrainian state had survived the "Orange Revolution" 3 years later.[138] Due to this peaceful government shift, Putin found himself negotiating with a new government that was more closely aligned with democracy and the EU.[139] Gazprom made plans to replace subsidized pricing given to previous governments in favor of "market prices", as well as calling in debts and accusing Naftogaz, the Ukrainian national natural gas company, of taking gas that should have ended up in Europe.[140] Negotiations over new pricing went sour in 2005.[141] Ukraine threatened to take gas destined for Europe, which resulted in a complex agreement involving Gazprom, Ukrainian Authorities, the EU, Turkmenistan, and some other central Asian countries.[142]

The foremost result was much higher gas revenue and a strengthened bargaining position for Russia.[143] The compromise was widely criticized by Ukrainians.[144] Russia also retained a significant amount of control over the natural gas transmission.[145] Ukrainian gas consumption now originated from a diverse set of sources, much of the exported gas still flowed through Russian territory.[146]

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132. *See* Nygren, *supra* note 74.
133. *See id.* at 5.
134. *See id.* at 13.
135. *See id.* at 5–6.
136. Metais, *supra* note 5, at 4.
137. Nygren, *supra* note 74, at 5.
138. *See id.* at 6.
139. *Id.* at 6.
140. *See Ukraine takes extra Russian gas*, BBC NEWS (Jan. 24, 2016, 11:36GMT), http://news.bbc.co.uk/2/hi/europe/4642684.stm.
141. *See* Nygren, *supra* note 74, at 6.
142. *Id.* at 6.
143. *See* SIMON PIRANI ET AL., THE RUSSO-UKRAINIAN GAS DISPUTE OF JANUARY 2009: A COMPREHENSIVE ASSESSMENT 9 (2009).
144. Nygren, *supra* note 74, at 6.
145. *See id.*
146. *Id.* at 6.

Exacerbating this effect, Ukraine was not permitted to negotiate with these new partners directly.[147] While this dispute arose from a set of basic economic disputes spurred by political context, the important effects on the EU of gas shutdowns showed the world that Russia owned a significant policy bargaining chip that it was willing to use.[148] While being able to avoid shocks to supply, various different conflicts and disagreements continued to sprout between Russia and its gas trading partners.[149] Against the backdrop of a complex Russian "victory" in 2006, and uncertainties still plaguing Eastern Europe, the next conflict began to form.[150]

2. Gas Shut Off in 2009

The 2009 Gas shut off occurred over issues similar to the previous crisis.[151] Prices, taxes, and other financial disputes built upon new factors like internal conflicts between various politicians and gas producers in Kiev.[152] Both of these disputes affected not just Ukraine, but also the EU at large.[153] A key difference between 2006 and 2009 was that the 2009 dispute was much more severe, resulting in a total supply shutoff to Ukraine, including gas that was intended for the EU.[154] Some countries experienced economic crises, with certain Balkan states even experiencing what EU officials termed a "humanitarian emergency[.]"[155] This pulled the EU into the conflict. Ukraine had explicitly requested European involvement in settling the dispute.[156]

An extensive agreement on prices and gas delivery was signed at the tipping point of the global financial crisis in October 2008.[157] However, debt obligations of Naftogaz detailed in this agreement were not met (according to Gazprom) and the dispute escalated rapidly.[158] After repeated warnings about not reaching an agreement, Putin oversaw the cutting of gas supplies on January 1, 2009.[159] As mentioned above, the effects were widespread and powerful, despite the crises only lasting three weeks.[160]

The agreement that ended the dispute was not completely one sided, suggesting that despite Russia's advantageous position, Putin either did not believe

147. *See* PIRANI ET AL., *supra* note 143, at 9.

148. *See* Metais, *supra* note 5, at 7.

149. *See* Nygren, *supra* note 74, at 6.

150. *See id.*

151. *See Ukraine asks EU to take part in settlement of Ukrainian-Russian gas dispute,* INTERFAX-UKRAINE, (Jan. 1, 2009), http://en.interfax.com.ua/news/general/4213.html.

152. *See* PIRANI ET AL., *supra* note 143, at 10, 12.

153. Metais, *supra* note 5, at 7.

154. PIRANI ET AL., *supra* note 143, at 22.

155. *Id.* at 4.

156. *See Ukraine asks EU to take part in settlement of Ukrainian-Russian gas dispute,* INTERFAX-UKRAINE (Jan.1, 2009), http://en.interfax.com.ua/news/general/4213.html.

157. *See* PIRANI ET AL., *supra* note 143, at 15.

158. *Id.* at 16.

159. *Id.* at 19.

160. *Id.* at 63.

Russia held all the power in negotiations with Ukraine or he felt it necessary to give Ukraine certain concessions.[161] The deal aims to establish ten years of gas provision and establishes prices below what Europe pays for gas just for Ukraine.[162] That said, Putin clearly flexed the foreign clout granted to him from being in control of Gazprom.[163] Gazprom was the only Russia to Ukraine exporter, and Naftogaz faces large financial burdens under strict repayment terms.[164] The Ukranian President at the time, Viktor Yushchenko, was himself a critic of the deal, even though he decided to respect it (he had no other choice).[165] Because of the need for natural gas by other countries, particularly for heating (during winter months) and production of electricity, this gives Russia, and especially Putin, coercive power through the "tap weapon."

3. Crimea and Energy Policy in the 2014 Land Disputes

By way of the annexation of Crimea and ongoing pursuit of sovereignty in disputed regions, Russia is not blatantly violating international law, but exploiting a tension within the post-World War II international order between self-determination and acquisition of territory.[166] This is not unlike actions taken by the United States to expand its influence.[167] However, the precedent being exploited may destabilize other parts of the world, and it does constitute a stretch in policy by Russia claiming to protect individual rights by annexing territory.[168] Much of the Crimean population, while living under the Ukrainian government, is Russian speaking and identify ethnically as Russian.[169] Crimeans see this identity as having political significance, voting in March of 2014 to become a Russian territory and leave Ukrainian rule.[170]

Putin took advantage of this vote, lining military up at the Ukrainian border and likely supporting pro-Russian paramilitary groups while denying any direct involvement currently.[171] While defending the referendum, Putin subtly insisted on his right to defend "Millions of Russians and Russian-speaking people."[172] Russia has stopped gas transmission over financial disputes,[173] so it is

161. *See id.* at 26–28.

162. *Id.* at 26.

163. *See* PIRANI ET AL., *supra* note 143, at 26–30.

164. *Id.*

165. *Id.* at 30.

166. *See* William W. Burke-White, *Crimea and the International Legal Order, Faculty Scholarship Paper 1360*, PENN LAW: LEGAL SCHOLARSHIP REPOSITORY (2014), http://scholarship.law.upenn.edu/faculty_scholarship/1360.

167. *Id.* at 1.

168. *Id.* at 1–3.

169. *Ukraine's sharp divisions*, BBC NEWS (Apr. 23, 2014), http://www.bbc.com/news/world-europe-26387353.

170. Burke-White, *supra* note 166, at 1-3.

171. Burke-White, *supra* note 166, at 5.

172. Burke-White, *supra* note 166, at 4.

173. *See generally* PASQUALE DE MICCO, CHANGING PIPELINES, SHIFTING STRATEGIES: GAS IN SOUTH-EASTERN EUROPE, AND THE IMPLICATIONS FOR UKRAINE 4–21 (2015).

hard to think that the tap weapon is off the table in this dispute. While certain arguments can be made in favor of a Russian Crimea, the EU should not be crippled by energy security needs in attempting to be a force for neutrality and international law in this dispute.

The EU would be unable to stop importing Russian natural gas tomorrow, unless it arrives at a comprehensive new energy and environmental plan. However, continued dependence on Russian natural gas leaves the EU exposed to Russia's tap weapon for its political and economic goals under President Putin.[174] Given recent events,[175] this would be problematic not just for the energy policy of the EU, but for regional sovereignty. The recent Russian attempts to annex Crimea have actually contributed to European solidarity at a time when economic crisis has pushed EU member states apart on various issues.[176] However, it is relevant to note that public perception in Europe is that the EU has acted weak in the face of Russian aggression.[177] It has been suggested Putin and his actions might be what the EU needs to unite politically.[178]

Not only were sanctions against Russia imposed following the downing of Malaysia flight 17 in the ongoing paramilitary conflict in Ukraine, but the EU has also begun to implement strategies to cut its reliance on Russian energy exports.[179] This proves that the EU is fully aware of the threat that Russia can pose with the tap weapon. If there were reason to believe Russia was rather limited in using gas exports to coerce foreign governments, the EU's reaction to Crimea would center on diplomatic relations and military involvement. The inclusion of energy as a part of the European response to Russian aggression proves that European energy security is a foreign policy and global security issue, not just an economic one.

4. Alternate Proposed Energy Routes

Despite the fact that, as mentioned above, the EU has publicly called enhancing energy security a priority,[180] an economically weakened Eurozone is objectively on the path to greater, not lesser, dependence on Russia,[181] as I will show in this and the following sections. Greece has recently reversed its policy and allowed for more pipeline construction through its territory from Russia, and Gazprom has claimed to reach a deal with several other European energy

174. *Id.* at 20.

175. For example, Russia annexing the Crimea. *See generally* Burke-White, *supra* note 166.

176. Tatia Dolidze, *EU Sanctions Policy towards Russia: The Sanctioner-Sanctionee's Game of Thrones* 4–5 (CEPS, Working Paper No. 402, 2015), https://www.ceps.eu/system/files/WD%20402%20TD%20Sanctions.pdf.

177. Matthias Matthijs & R. Daniel Kelemen, *How to Save the European Union From Irrelevance,* 94 FOREIGN AFFAIRS (2015), https://www.foreignaffairs.com/articles/europe/europe-reborn.

178. *Id.*

179. *Id.*

180. *See* discussion *infra* Section II(A)(1-3).

181. L. MANTZOS, ET AL., EUROPEAN ENERGY AND TRANSPORT SCENARIOS ON KEY DRIVERS 33 (J. Chessire ed., 2004).

companies to start exporting more natural gas.[182] The Greek (and Turkish) pipelines may double in capacity, according to Gazprom, all while the EU has stated the need for energy security.[183] Additionally, the EU has even filed an anti-monopoly claim against Gazprom.[184]

As a result, the EU has struggled to send a unified message to Russia and Putin regarding energy dependence, by being involved in alternate gas routes around Ukraine while also criticizing and imposing sanctions on Russia for annexing Crimea. [185] This project and similar projects have been sharply criticized for granting Russia increased influence via more gas exports.[186] While certain new projects can improve efficiency, there are no proposed pipeline changes that will drastically cut European consumption of natural gas, nor give the EU better supply control.[187] The two major pipeline projects that have been proposed, Balticonnector and Gas Interconnection Poland-Lithuania, aim to diversify sources and protect security, but neither project clearly demonstrates a way to decrease Russian imports dramatically.[188]

III. EU'S ENVIRONMENTAL POLICY AND ENERGY CONSUMPTION

Since 1990, the EU and surrounding area has sustained a significant economic growth rate of roughly 2% GDP per capita.[189] Energy intensive sectors (industries that require very high energy consumption to sustain output)[190] have grown somewhat slower than the economy over all, causing the overall energy sector to grow much slower.[191] Regardless, this economic growth has sustained a clear growth in the energy needs of the EU, illustrated by the steady rise in imported energy over the past two and a half decades.[192] The European Commission projects this reliance to increase at an alarming rate, given reasonable assumptions, with the EU importing over 67% of their energy supply by 2030.[193] Thus, Europe faces significant structural pressure to obtain energy security via greater leverage in securing supply abroad, create a strategy to decrease imports via better

182. *See* Nektaria Stamouli & James Marson, *Greece to Sign Russian Gas Pipeline Deal,* WALL STREET JOURNAL (June 15, 2015 8:54am), http://www.wsj.com/articles/greece-to-sign-russian-gas-pipeline-deal-1434631581.

183. *Id.*

184. *Id.*

185. *Id.*; Roxana Ioana Banciu, *South Stream Project and the Ukrainian Factor*, 15 ROMANIAN J. EUR. AFF. 55 (2015).

186. Roxana Ioana Banciu, *supra* note 185, at 57.

187. Chyong & Techerneya, *supra* note 2.

188. Chyong & Techerneya, *supra* note 2.

189. MANTZOS ET AL., *supra* note 181, at 33.

190. *Industrial Overview*, CENTER FOR CLIMATE & ENERGY SOLUTIONS, http://www.c2es.org/energy/use/industrial.

191. MANTZOS ET AL., *supra* note 181, at 34.

192. *Id.* at 40.

193. *Id.*

production at home, or implement policies that work towards both of these objectives.[194]

The EU's commitment to lowering $C0_2$ emissions has been a major defining factor in its modern policy approach.[195] This commitment has made several EU countries leaders in producing green energy,[196] but is also one of the major forces driving Europe to import energy sources.[197] A unified approach has already been laid out as crucial to success in energy security for the EU.[198] The EU must now either import less energy or at least demonstrate it is capable of importing less energy if it is to achieve energy security and strengthen its bargaining power in international policy. The EU's current policies (most important of which is the European Union Emissions Trading System, or EU-ETS)[199] cannot achieve this goal, and stand to exacerbate the problem of reliance on imported energy.

A. EU-ETS

The "phase one" implementation of the EU-ETS in 2005 was described as a "learning-by-doing" pilot program, limited in its scope.[200] "Phase two" implementation of the program takes into account policy lessons learned, attracting more participating nations, and increased the proportion of emissions auctioned off rather than granted freely.[201] Eight years into the program, the EU-ETS has been successful in establishing a vibrant market for emissions permits, with an increasing trading volume propped up by involvement from several private market players.[202] It would certainly be an exaggeration to say that the EU-ETS was not a political accomplishment, and unlike Kyoto, the EU-ETS represents an active international climate policy.[203]

Despite the limited success in the above areas, the EU-ETS has been tangled by economic deficiencies and plagued by unrealized environmental goals.[204] While embraced by environmentalists and climatologists at its inception, many of the EU-ETS original proponents have lost faith and have even called for either sweeping reform or scraping of the program.[205] According to UBS

194. *See generally id.*

195. *See Eurostat Statistics Explained, supra* note 30, at 1–2.

196. "Green energy" is a common way of referring generally to various technologies that can produce energy without significant environmental harm. *See Green Energy*, CAMBRIDGE DICTIONARY, http://dictionary.cambridge.org/us/dictionary/english/green-energy.

197. EUROSTAT, *supra* note 30, at 2.

198. *See generally* Metais, *supra* note 5.

199. *See* discussion *infra* Section III(A).

200. *See Emissions Trends*, *supra* note 51, at 19.

201. EU ETS HANDBOOK, EUROPEAN COMMISSION 18–20, http://ec.europa.eu/clima/publications/docs/ets_handbook_en.pdf.

202. *Id.* at 34.

203. *See Renewable energy progress report*, *supra* note 25.

204. *See generally Anna* Petherick, *Holding Out Hope*, 3 NATURE CLIMATE CHANGE 534, 534 (2013).

205. *See generally id.*

Investment Research, the EU-ETS has cost $287 billion USD through 2011 and had almost zero impact on the overall volume of emissions in the EU.[206] This was the result of an over-allocation of allowances, which was further exacerbated by the 2008 financial crisis, and ultimately led to a collapse in prices on the carbon market.[207] The third phase of the EU-ETS, running from 2013 to 2020, aims to reduce greenhouse gases by 20% compared to the EU's 1990 emission levels.[208] This target falls a long way short of what environmentalists suggest to avoid dangerous climate change.[209]

Excess Provision of Permits

The principal failure of the EU-ETS can be drawn back to the implementers succumbing to industry pressure and freely allocating too many permits.[210] Even sometime after implementation, the EU-ETS system auctions off only 40% of the allowances that the policy distributes.[211] This over-allocation of emissions permits exceed what was necessary for the industry to adapt to difficult economic times,[212] As in the various stages of program implementation, the yearly emission limits of the system were set higher than the emissions in previous periods, even periods before the financial crisis of 2008 which lowered general emission levels.[213] This did not just ease cost on high emitters, but ruined the plans of low emitters that wished to sell their allowances; from 2008 – 2014, allowances prices dropped by over 500%.[214]

This will leave irreversible damage to the prospects of clean innovation, as industrial actors in both the energy and finance industry may consider these allowances a risky asset, due to their price history. The EU also ruined a chance to attract clean energy capital, including investments and human capital in the form of "green jobs."[215] This phenomenon of professionals that have the capacity to contribute to reduced emissions leaving the EU has been called "green job leakage", and as a policy brief by the industry group "Carbon Market Watch" explains,

> The European industry is therefore at risk of falling behind in deploying low-carbon technologies compared to their competitors abroad.

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206. VINCENT GILLES ET AL., UBS INVESTMENT RESEARCH: EUROPEAN EMISSIONS TRADING SCHEME (2003), http://www.unepfi.org/fileadmin/documents/materiality1/emissions_trading_eu_ubs_2004.pdf.

207. *Id.*

208. *Renewable energy progress report, supra* note 25, at 5.

209. CARLO JAEGER & MICHAEL OPPENHEIMER, EMISSIONS PATHWAYS TO AVOID DANGEROUS CLIMATE CHANGE — A TRANS-ATLANTIC VIEW 2 (2005).

210. CARBON MARKET WATCH, WHAT'S NEEDED TO FIX THE EU'S CARBON MARKET RECOMMENDATIONS FOR THE MARKET STABILITY RESERVE AND FUTURE ETS REFORM PROPOSALS 2–3 (2014).

211. *Renewable energy progress report, supra* note 25, at 3.

212. CARBON MARKET WATCH, *supra* note 210, at 2.

213. *Id.* at 3.

214. *Id.* at 3.

215. *See id* at 7.

> Currently the most efficient cement production occurs in Asia, particularly in India and China. In the steel sector, the European installations often perform worse than the global average.[216]

These failures are particularly important in their nature. Since the allocation of permits has been dependent on market dynamics, the EU-ETS has failed to yield benefit certainty, one of the main advantages that a Cap and Trade program boasts.[217] According to the UBS report, over allocation could lead to price increases across the EU as companies fail to sell their permits for their projected price in the context of price collapses.[218] The data analysis done by Carbon Market Watch clearly shows that the European Commission's Market Stability reserve (created in 2014) will not be enough to get the EU back on track.[219] The plan of the European commission to "backlog" allowances, slowly reducing the number of auction allowances over the next few years below the original amount planned, is only a temporary fix, as the current plan will allow the allowances to return to the market in several years.[220]

B. The Energy Security Flaws Imbedded in Current EU Climate Policy

I have discussed above the issues, both theoretical and observed in history, with the EU's dependence on natural gas from Russia. Natural gas usage emits less carbon per unit of energy generated, so any policy that demands lower emissions, but doesn't build new supply, is intuitively likely to increase this reliance.[221] More in depth research confirms this, and more; the UBS report concludes that European demand for natural gas will continue to increase under current conditions, and that this increase in demand is directly related to the EU-ETS.[222] The demand is projected to increase even further if the EU-ETS fixes its weakness as a climate policy by ending the over auctioning and granting of allowances.[223] This increase in demand will almost certainly result in price increases, with the final price being passed to consumers'.[224] This will incentivize some natural gas extractors to return to Europe, but most of the increased demand will be met by increased imports,[225] which will increase dependence on Russia and further dilute the EU's policy leverage. Thus, the EU-ETS is not a system that can meet its ambitious environmental goals while increasing energy independence. By its nature, it can only do one or the other.

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216. *Id.*

217. *See generally* Robert Hahn & Robert Stavins, *The Effect of Allowance Allocations on Cap-and-Trade System Performance*, 54 J. L. & ECON. S267, S269-71 (2011) [hereinafter Hahn & Stavins].

218. VINCENT GILLES ET AL., *supra* note 206, at 17.

219. CARBON MARKET WATCH, *supra* note 210, at 6.

220. *Id.*

221. Sarah Zielinski, *Natural Gas Really Is Better Than Coal*, SMITHSONIAN.COM (2014), http://www.smithsonianmag.com/science-nature/natural-gas-really-better-coal-180949739/?no-ist.

222. VINCENT GILLES ET AL., *supra* note 206, at 9.

223. CARBON MARKET WATCH, *supra* note 210, at 6.

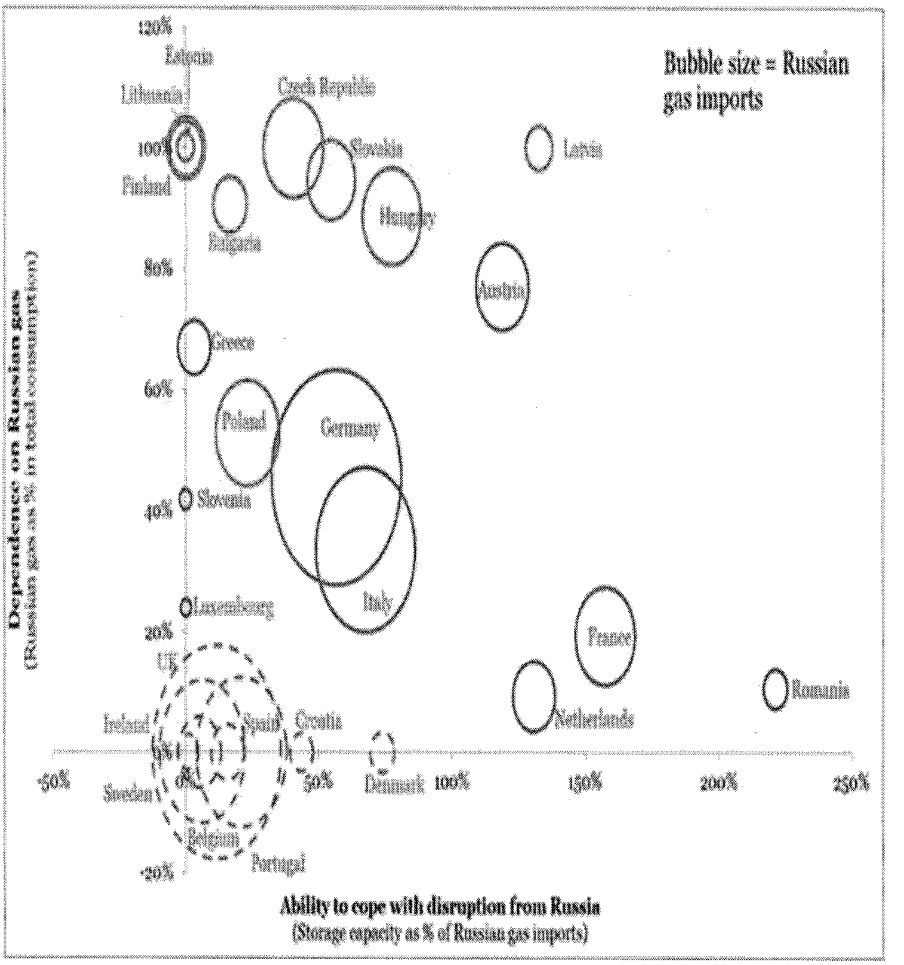
224. VINCENT GILLES ET AL., *supra* note 206, at 12; CARBON MARKET WATCH, *supra* note 210, at 7.

225. VINCENT GILLES ET AL., *supra* note 206, at 93.

1. Need for Cohesive Energy and Environmental Policy across the EU

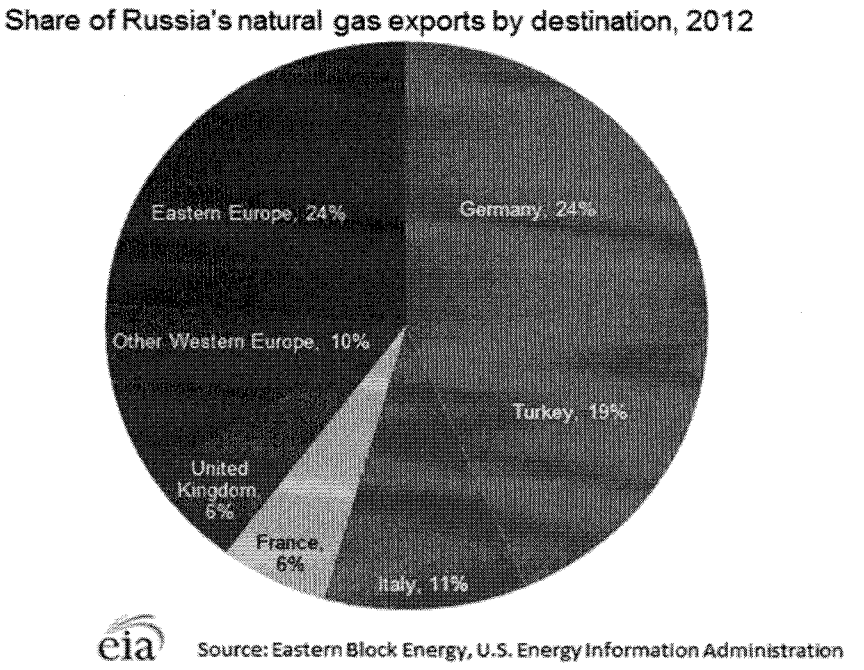
The EU is surprisingly dependent on Russia for natural gas used to heat homes and produce electricity.[226]

Figure 5: EU Natural Gas Vulnerability by Country[227]



226. Chyong & Tcherneva, *supra* note 2, at 1–2.
227. *Id.* at 2.

Figure 6: Russian Natural Gas Destination[228]



The EU's dependence on natural gas is high, as Figure 5 demonstrates.[229] President Reagan correctly foresaw that dependence on natural gas pipelines and the gas they would provide would indeed limit Europe's policy options, unless Europeans would be willing to be left out literally in the cold.[230] Certain countries in the EU would suffer both deeply and immediately in the event of a gas shut off (as happened in 2009), while some countries have developed the capacity to adjust to slowdowns (between gas storage and alternative power supplies, including coal).[231] This is problematic because Russia could effectively increase divisiveness within the EU, rendering the entire Union less effective at negotiating on an international

228. *Russia*, U.S. ENERGY INFO. ADMIN. (updated Jul. 28 2015), https://www.eia.gov/beta/international/analysis_includes/countries_long/Russia/russia.pdf.

229. *Id.*

230. Jeffrey Shapiro, *Reagan administration warned Russian pipeline through Ukraine would weaken West*, WASHINGTON TIMES (Mar. 5, 2015), http://www.washingtontimes.com/news/2014/mar/5/reagan-administration-warned-russian-pipeline-thro/.

231. Adam Withnall, *Putin's gas threat: What happens if Russia cuts the gas to Europe?*, INDEPENDENT (Feb. 27, 2015), http://www.independent.co.uk/news/world/europe/putins-gas-threat-what-happens-if-russia-cuts-the-gas-to-europe-10074294.html.

level. This is a diplomatic reason that the EU needs to lower its natural gas consumption.

The Treaty of Lisbon states that EU measures "shall not affect a Member State's right to determine the conditions for exploiting its energy resources, its choice between different energy sources and the general structure of its energy supply, without prejudice to Article 192(2) (c),"[232] while Article 194 reads:

> 1. In the context of the establishment and functioning of the internal market and with regard for the need to preserve and improve the environment, Union policy on energy shall aim, in a spirit of solidarity between Member States, to: (a) ensure the functioning of the energy market; (b) ensure security of energy supply in the Union; (c) Promote energy efficiency and energy Saving and the development of new and renewable forms of energy; and (d) promote the interconnection of energy networks.[233]

This creates an inherent tension between state autonomy over energy policy and grid integration within the union, which could be exploited by Russia due to uneven economic effects in the event of a gas shut off.

Thus it is prudent, in attempting to stay true to the EU's original intentions and in making better energy, environmental, and foreign policy, for the EU to pursue a policy that can be both flexible and unified. Even allies abroad such as the U.S. have joined the chorus of expert and policy maker voices calling for a pooling of resources to create a united and cohesive strategy.[234] Not only does a unified strategy increase the bargaining power of the EU (the entire union threatening to sanction Russian gas would carry significant diplomatic weight chip with Russia), but the entire EU energy grid becomes more efficient, as a unified strategy allows companies to deal with the same regulations and standards across borders and compete on a larger level.[235] These are just two of many interrelated advantages of an integrated strategy in the EU.[236]

Over 70% of the EU's energy imports are unstable because of unstable geopolitical situations and profound threats of nationalization, wherein a local government seizes control of natural resource assets to use as a foreign policy tool.[237] A lack of a united, integrated European strategy is severely limiting on the amount of weight states within the EU bring to the bargaining table.[238] Because of asymmetrical energy needs, economic conditions, and various social factors,

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232. Consolidated Version of the Treaty on the Functioning of the European Union art. 194, 2012, 2012/C 326/01 [hereinafter TFEU]; *see also The Lisbon Treaty and Sustainable Energy*, INFORSE.ORG, http://www.inforse.org/europe/eu_table_lisbon.htm (last visited Dec. 18, 2016).

233. *Id.*

234. Matthijs & Kelemen, *supra* note 177.

235. Rafael Leal-Arcas & Andrew Filis, *Conceptualizing EU Energy Security Through an EU Constitutional Law Perspective*, 36 FORDHAM INT. L.J. 1225, 1258 (2013).

236. *Id.*

237. Metais, *supra* note 5, at 20.

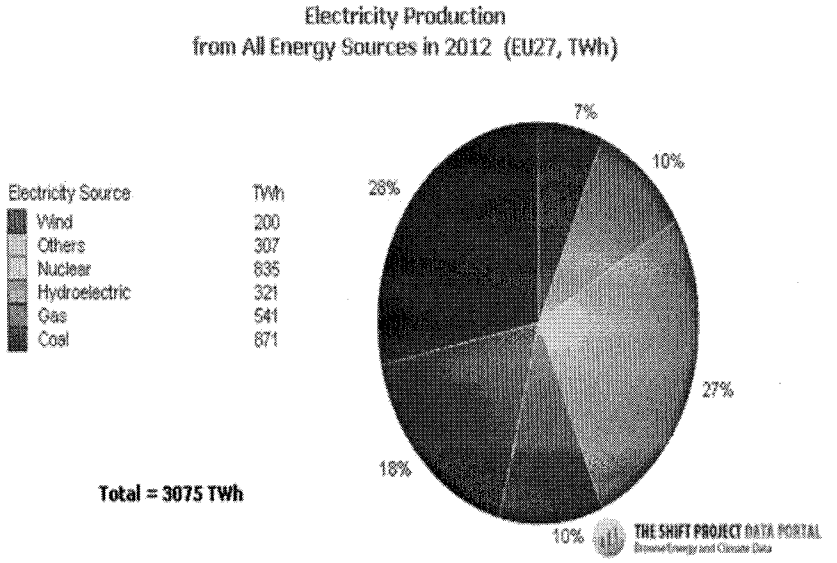
238. Metais, *supra* note 5, at 21.

different countries in the EU have dealt with Russia differently, severely hurting the EU's overall ability to bargain.[239] A united policy could reverse that.

2. Potential Alternatives

As established previously, the EU is in need of alternatives to Russian natural gas, ideally coming from a unified approach as shown in Figure 6.[240]

Figure 7: EU Electricity Production from All Sources[241]



The EU is a global leader in clean energy and has a diverse set of options in exploring substitutes for Russian natural gas.[242] Current alternatives exist, but at high price points and high risk.[243] Many alternate importers are either very far or in areas that are politically unstable (much more so than Russia).[244] The EU does

239. Metais, *supra* note 5, at 22.

240. *Breakdown of Electricity Generation by Energy Source*, THE SHIFT PROJECT DATA PORTAL, http://www.tsp-data-portal.org/Breakdown-of-Electricity-Generation-by-Energy-Source#tspQvChart.

241. *Id.*

242. Cassie Werber, *The world's biggest polluter is now the global leader in renewable-energy spending*, QUARTZ (Mar. 18, 2016), http://www.tsp-data-portal.org/Breakdown-of-Electricity-Generation-by-Energy-Source#tspQvChart.

243. Vessela Tcherneva, Chi Kong Chyong, & Louisa Slavkova, *Europe's alternatives to Russian Gas*, EUROPEAN COUNCIL ON FOREIGN RELATIONS (Apr. 9, 2015), http://www.ecfr.eu/article/commentary_europes_alternatives_to_russian_gas311666.

244. *Id.*

have a commission in charge of governing energy partners and making changes, but this commission would be empowered by more alternatives.[245]

a. LNG (liquefied natural gas)

Natural gas that is exported in liquid form, rather than gas form, is known as liquefied natural gas (LNG).[246] LNG is exported by a wide variety of countries in North America, the Middle East, Australia, and East Africa.[247] LNG is more costly to import though: it must be cooled, packed and shipped, and then re-vaporized.[248] A large port in the EU, that was costly to build, has essentially gone unused due to a lack of liquefaction plants.[249] Also worth noting, global demand, especially in Asia, makes shipping LNG to Europe less profitable, and until prices rise sufficiently in Europe, be it due to Russian cut-offs or a determination to be less dependent on Russia, there is little chance LNG will replace Russian natural gas anytime soon.[250] So although LNG is a very viable but expensive option, it would require significant investments in producing countries to take advantage of this particular alternative, but the U.S. just might be willing to make those investments.[251] Regardless, the EU has been strongly encouraged to pursue more LNG consumption.[252] Shale Gas faces similar issues.[253]

b. Coal

The EU's pursuit of leaving coal and similarly "dirty" (high emissions) forms of energy has directly lead to increased reliance on imports in an important way.[254] Coal has been looked down upon politically in the EU as it is a dirty form of energy.[255] It is also somewhat scarce, with only Poland containing significant reserves.[256] That said, coal has not completely faded away as a viable source of energy for some parts of Europe, as Estonia, Poland, Czech Republic, and Bulgaria all have Coal as a majority source for energy.[257] Since Europe has ambitious climate goals in the long-term, Coal is only going to play a small role in Europe's energy future, but with the right investments in CCS and similar technologies

245. *Id.*

246. *Id.*

247. *Id.*

248. Frank Dohmen &Alexander Jung, *Cold Turkey: How Germany Could End Russian Gas Dependency*, SPIEGEL ONLINE (May 6, 2014), http://www.spiegel.de/international/business/german-alternatives-to-russian-gas-numerous-but-pricey-a-967682.html.

249. *Id.*

250. *Id.*

251. Patti Domm, *U.S. exports of LNG mark a turning point in the market*, CNBC (Feb. 25, 2016), http://www.cnbc.com/2016/02/25/us-exports-of-liquified-natural-gas-mark-a-turning-point-in-the-energy-market.html.

252. Chyong & Tcherneva, *supra* note 2.

253. Dohmen & Jung, *supra* note 248.

254. *See Eurostat Statistics Explained, supra* note 30.

255. *Id.*

256. *Id.*

257. Chyong & Tcherneva, *supra* note 2.

could help bridge a gap between an energy mix oriented toward Russian gas and one that is far less dependent.

c. Nuclear

Nuclear energy is a controversial subject in Europe due to security concerns about nuclear energy post-Fukushima, a disaster involving nuclear energy in Japan.[258] That said, the EU still produces about 30% of its energy using nuclear plants.[259] Because of this, nuclear is part of EU's energy future plans already, as the EC has detailed out the best countries where nuclear can be expanded.[260] Russian aggression may be the key variable in convincing Europe to expand its nuclear capacity and make serious investments, especially because some of the nations where nuclear is viewed as a potential new alternative are toward the east side of Europe, near the Russian border.[261]

Perhaps the biggest challenge for nuclear advocates in Europe is the fact that two of the largest economies in the entire EU are split on the nuclear issue.[262] France already produces 75% of its energy from nuclear sources, and may be expanding.[263] The country is finding ways to recycle nuclear fuel into more energy and plans to continue exporting this power.[264] This is occurring while Germany's political inertia runs the opposite direction, as generation capacity has angled sharply downward.[265] Political support is almost nil, with strong wind and coal sectors for power generation and great public fear surrounding nuclear plants.[266] As recently stated, energy policy will work best when integrated across borders. That is not to say some per country flexibility to manage idiosyncrasies cannot exist, but it stands to reason that some of this gap will have to be bridged between these two major powers if the EU will be approaching energy holistically. At the very least, low nuclear countries like Germany should show they are willing to invest in alternatives like nuclear to decrease Russian willingness to use the tap weapon.

d. Green Energy

The EU is a global leader in producing clean or green energy.[267] Because of the region's ambitious climate goals, it is sensible to view clean energy as one

258. *Emissions Trends*, *supra* note 51, at 11.

259. *Id.* at 47.

260. *Id.* at 24.

261. *Id.*

262. *Nuclear Power in France*, WORLD NUCLEAR ASSOCIATION (July 2016), http://www.world-nuclear.org/info/Country-Profiles/Countries-A-F/France/; *Nuclear Power in Germany*, WORLD NUCLEAR ASSOCIATION (Oct. 2016), http://www.world-nuclear.org/info/Country-Profiles/Countries-G-N/Germany/.

263. *Nuclear Power in France*, *supra* note 262.

264. *Id.*

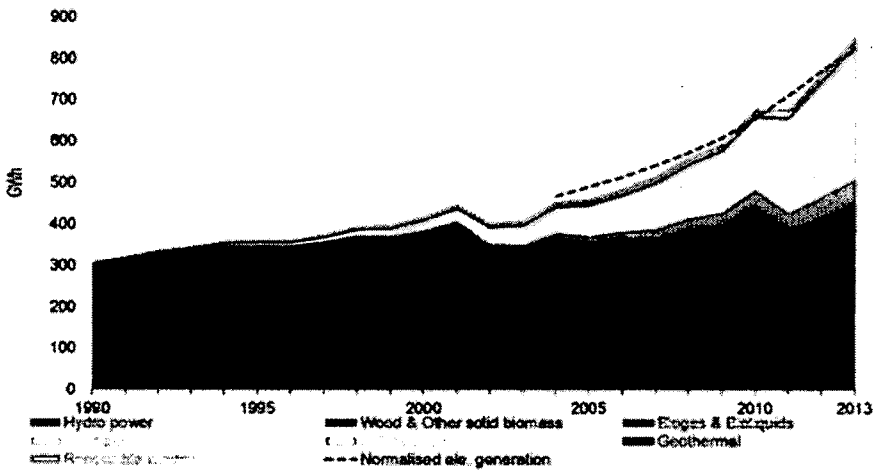
265. *Nuclear Power in Germany*, WORLD NUCLEAR ASSOCIATION (Oct. 2016), http://www.world-nuclear.org/info/Country-Profiles/Countries-G-N/Germany/.

266. *Id.*

267. BP, *supra* note 59, at 39.

of the most attractive alternatives to Russian natural gas. If capacity could be dramatically increased even further, the EU could successfully dilute Russian influence via the tap weapon, while increasing scale production (and most likely efficiency) in the clean energy sector. The biggest challenge with most renewable energy resources is not just cost and capacity, but availability, as the sun and wind do not tend to shine or blow when power is needed.[268] According to the EC, there are good reasons for caution and optimism in using renewable energy to increase generation capacity in Europe.[269] As an example, if solar power can only be relied on six hours a day or 25% of a day, then four times the capacity needs to be built to provide the same level of supply as a carbon fueled or nuclear fueled power plant.[270] Additionally, production capacity of renewable power has increased rapidly, as shown in Figure 7.[271]

Figure 8: EU Renewables[272]



Source: Eurostat

A recent EC report concluded that, "[a]lready today, 26% of the EU's power is generated from renewables. About 10% of the total EU electricity is sourced from variable renewable electricity (such as wind and solar)."[273] Much of the optimism is in the heating sector using biomass driven methods and other similar innovations.[274]

268. *Id.*
269. Renewable Energy Progress Report, COM (2015) 293 final, at 16 (Jun. 15, 2015).
270. *Id.* at 3.
271. *Id.* at 8.
272. *Id.*
273. *Id.* at 3.
274. *Id.* at 3.

IV. CARBON TAX

My proposal is a modified version of the traditional carbon tax. In this section, before detailing my proposal, I review what a carbon tax is, setting the stage for its utility in replacing the EU-ETS, before showing how my unique approach to carbon taxation is an even more viable alternative. The carbon tax is the most popular alternative to a Cap and Trade scheme.[275] There have been a multitude of proposals that range in size, scope, and structure, disproving the myth that the Carbon Tax is an inflexible policy mechanism.[276] Carbon taxes (of various types) have been implemented in parts of Canada, Australia, Chile, Ireland, and several other countries.[277] The political viability of the Carbon Tax was limited by the very word "tax" in the general history of the policy, yet as the real costs of any effective climate policy become clearer, the carbon tax has returned to the forefront of political discussion.[278] This is because the policy has a set of distinct advantages.

A. What is a Carbon Tax?

The Carbon Tax is a tax that is imposed per some amount of carbon emissions by some entity (for instance a power plant, company, or vehicle) and often times per Metric ton of Carbon Dioxide equivalent ($MtCO^2_e$).[279] The tax has also been used to isolate and discourage a particular form of consumption, such as fuel or particular forms of energy.[280] The Carbon Tax is an extremely straightforward policy, taxing Carbon emissions, wherein economists have even tried to approximate the marginal societal damage of each $MtCO^2_e$ emitted, with the intention of creating a carbon tax that directly compensates society for emissions.[281]

1. Advantages

The primary advantage of the Carbon Tax, especially when contrasted to Cap and Trade, is the price stability or "cost certainty" provided by the tax.[282] Having a predetermined schedule for exactly how much emissions will cost makes integration with other policies simpler.[283] Cost certainty allows businesses to

275. Phil Levy, *The Carbon Tax/Cap-and-Trade Royal Rumble,* FOREIGN POLICY (May 13, 2009), http://foreignpolicy.com/2009/05/13/the-carbon-taxcap-and-trade-royal-rumble/.

276. Gilbert E. Metcalf, *Designing a Carbon Tax to Reduce U.S. Greenhouse Gas Emissions* (Nat'l Bureau of Econ. Research, Working Paper No. 14375, 2008), http://www.nber.org/papers/w14375.

277. *Where Carbon is Taxed,* CARBON TAX CENTER, http://www.carbontax.org/services/where-carbon-is taxed/.

278. Metcalf, *supra* note 276, at 3.

279. *Id.* at 4.

280. *Where Carbon is Taxed, supra* note 277.

281. Roberta Mann, *To Tax or Note To Tax Carbon – Is That The Question?,* 24 NAT. RES. & ENV'T 44, 44 (2009).

282. *Id.*

283. *Id.* at 45.

better allocate resources, ensuring cost fluctuations do not become a significant unexpected cost to high emitting firms nor a loss of expected revenue from allowance sales, as was experienced during the allowance price crashes experienced by Europe.[284] Thus the Carbon Tax, a form of "explicit pricing", inspires market confidence, as the costs and benefits are understood by industries with significant emissions.[285] This constancy allows companies, households, and various other actors to adjust spending and investments to carbon prices, and may even increase the political viability of maintaining an implemented climate policy without compromises.[286]

Another comparative advantage of a Carbon Tax is the ability to create an explicit price that attempts to quantify agreed upon negative externalities.[287] While in a Cap and Trade scheme, allowance prices reflect fluctuating short-term market realities, these prices may or may not capture the true value of the negative externalities caused in the long term.[288] In fact, if the cost of these negative externalities does not fluctuate over time, fluctuating allowance prices imply a miss-pricing of carbon emissions as the price dips under and soars over the determined societal cost.[289]

The simple fact that the Carbon Tax is a tax carries with it a certain advantage of ease in implementation and flexibility, allowing revenue to pass through and be redirected by an administrative institution that is already in place and prepared to implement a tax.[290] The tax structure can be adjusted to counteract regressive or otherwise negative effects of the program before the program is implemented or even while the program is in effect, more rapidly than in a Cap and Trade scheme.[291] The Carbon Tax as a policy is not a panacea, as real world experiences are starting to show.[292] I explore disadvantages in the following section.

2. Disadvantages

The majority of carbon tax proposals lack the benefit certainty touted by the advocates of Cap and Trade schemes.[293] This concern is beyond theoretical. As an empirical example, researchers examined a relatively early carbon tax policy implemented in Norway and found that the tax was successful in reducing

284. VINCENT GILLES ET AL., *supra* note 206, at 17.

285. *Climate and Carbon Aligning Prices and Policies,* ORGANIZATION FOR ECONOMIC CO-OPERATION AND DEVELOPMENT 4-5 (Oct. 2013), http://www.oecd-ilibrary.org/environment-and-sustainable-development/climate-and-carbon_5k3z11hjg6r7-en [hereinafter OECD].

286. Metcalf, *supra* note 276, at 21.

287. *Id.*

288. *Id.* at 27.

289. *Id.*

290. *Id.* at 24.

291. *See generally id.*

292. Annegrete Bruvoll & Bodil Merethe Larsen, *Greenhouse gas emissions in Norway: Do carbon taxes work?* ENERGY POLICY (2004); Fredrik NG Andersson & Peter Karpestam, *The Australian Carbon Tax: A Step in the Right Direction but Not Enough,* CARBON MANAGEMENT (2012).

293. *See* Hahn & Stavins, *supra* note 217, at S269.

emissions, but not as much as originally hoped.[294] There have been similar results more recently in Australia.[295] The final environmental benefits obtained by a traditional carbon tax are highly dependent on complex factors, such as elasticity of demand, external market fluctuations, and adjustment mechanisms available to firms and households.[296]

Another disadvantage of the Carbon Tax that is commonly mentioned is the regressive effects, as lower income households spend a greater portion of their income on goods associated with high emissions, like energy and fuel.[297] These effects are present in cap and trade proposals as well,[298] but are less certain due to carbon price fluctuations. Any carbon tax proposal that will equitably benefit society should take regressive effects into account and use tax revenue or other methods to counteract these effects.[299] Indonesia is just one example that this is a very effective and implementable aspect of a carbon policy framework.[300]

3. Modern Variations in Implementation

Necessity has dictated the traditional carbon tax be adjusted to various social and economic realities. Since there is no carbon tax scheme as multinational as the EU-ETS, I cover several examples of implemented carbon taxes here. This is by no means a comprehensive review of the literature, but is a discussion intended to show how experience has been reflected in the nuances of my policy proposal. Carbon taxes are rarely fixed, but rather tend to increase marginally over time at a pre-specified rate, allowing households and companies to slowly adjust to the rate and corresponding price increases.[301] Rates have also fluctuated and exemptions been granted and revoked according to the economic and political climate.[302] Reinvestment of the tax revenue is another crucial factor that varies significantly between schemes[303]

Norway has one of the oldest and highest taxes on carbon emissions, and can attribute some of its environmental successes to this tax.[304] The Norwegian tax features "extensive exemptions and differentiation of tax rates" by emissions source, which is a less than optimal policy driven by political and economic realities.[305] While this scheme represents one of the most aggressive national climate policies to date, a good analysis of the policy concludes with the recommendation that countries attempting to implement a similar policy create "a

294. Bruvoll & Larsen, *supra* note 292.
295. Andersson & Karpestam, *supra* note 292.
296. OECD, *supra* note 285, at 28.
297. *Id.* at 41.
298. *See* Hahn & Stavins, *supra* note 217, at S269–71.
299. OECD, *supra* note 285, at 42.
300. *Id.*
301. *Id.* at 11.
302. *Id.* at 11.
303. *Id.* at 11, 14.
304. Bruvoll & Larsen, *supra* note 292, at 1.
305. *Id.* at 5.

more broad based, cost efficient tax, which is uniform for all sources and greenhouse gases."[306] Australia marks a much less successful example of a carbon tax.[307] After implementation of an aggressive tax in a toxic political climate, the tax was repealed.[308] It has been argued that the price was not high enough, and that there was not enough financial support being given to clean energy technologies.[309]

The Canadian province of British Colombia is one of the great carbon tax success stories.[310] The original plan was politically controversial, but its implementation was perfectly executed and the policy is still one of the highest and most successful in the world today.[311] The tax is roughly revenue neutral, enabled by massive cuts that correspond to the tax.[312] This proper reinvestment and political fortitude to maintain a constant and predictable tax schedule has contributed greatly to the longevity of the policy.[313] It should be noted that the cuts made are mostly realistic because of the ease of changing the energy supply in British Colombia as opposed to other parts of the world; British Colombia contains an abundance of hydroelectric energy.[314] This implies that other countries implementing a similar plan may need to invest more in alternative forms of energy.

V. THE CARBON TAX WITH REINVESTMENT (CTR)

Europe seems poised to continue to seek out natural gas providers[315] and continue to work with the EU-ETS as a regional climate strategy.[316] It is my belief that the EU would be better served by implementing a policy strategy that maximizes benefit and cost certainty while ensuring greater energy independence. This strategy would involve adopting a Carbon Tax with Reinvestment (CTR).[317] The CTR policy presents the best opportunity for Europe to become less dependent on Russian energy without crippling its own economy, thereby taking away a major policy weapon Russia currently holds. If the EU can levy a tax per ton of emissions of carbon dioxide and channel the revenue to building new infrastructure for energy production, emissions would dramatically decline while eliminating the need for Russian natural gas within a period of 6-10 years.[318]

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306. *Id.* at 23.

307. *Where Carbon is Taxed*, *supra* note 277.

308. *Id.*

309. *See* Andersson & Kerpestam, *supra* note 292.

310. *British Columbia / Canada*, CARBON TAX CENTER, http://www.carbontax.org/where-carbon-is-taxed/british-columbia/ (last visited Dec. 18, 2016).

311. *Id.*

312. *Id.*

313. *Id.*

314. *Id.*

315. *See Emissions Trends*, *supra* note 51.

316. EU ETS HANDBOOK, *supra* note 201.

317. Stephen Sewalk, *Project Financing an Energy Revolution in the USA*, 3 ENGINEERING PROJECT ORG. J. 141, 142 (2013) [hereinafter *Project Financing an Energy Revolution in the USA*].

318. Stephen Sewalk, *Europe Should Dump Cap-and-Trade in Favor of Carbon Tax with*

One of the principal questions of any carbon tax, as earlier discussed, is how the revenue ought to be used by the government collecting the tax.[319] The model under which the CTR reinvests revenue directly addresses energy independence and carbon emissions at once, rather than attempting to balance the policy objectives as competing ends.[320] Other practical policy benefits abound: the revenue is invested in infrastructure, thus creating significant economic stimulus, and since the tax is straightforward and contains a broad revenue base, modeling its effects can be done with a much higher degree of certainty than other policies.[321]

A. Summary of the Design

The Carbon Tax with Reinvestment is a tax that immediately reinvests carbon tax revenue in clean energy plants, with the intention of rebuilding a country's energy supply away from emitting sources.[322] The tax is simple, powerful, and flexible. It can be implemented at a relatively low rate, at roughly $\$5/MtCO_2e$, escalating on a predictable, linear basis over time.[323] Reinvestment is flexible to new technology, but the economic data implies that even without significant technological advancements, such a tax could pay for a complete restructuring of the energy infrastructure in many different economic circumstances.[324]

By quickly and efficiently reinvesting revenues, this policy is a strategy that could create benefit and cost certainty; both the tax and revenue reinvestments are implemented on a predictable schedule.[325] As discussed above, there is a "pick your poison" trade off of corresponding disadvantages in the cap and trade and carbon tax debate.[326] Cap and Trade provides benefit certainty via a set cap on emissions, and the carbon tax provides cost certainty via a set cost per unit of emissions. As I have presented in the in the sections above, when discussing real world implementation of each policy, it is abundantly clear that policy intention, when not coupled with practical economic plans, can be overcome by politicians thereby invalidating both benefit certainty in cap and trade and cost certainty in the carbon tax.[327] The CTR problematically ensures both cost and benefit certainty by adhering to a straightforward yet flexible tax and reinvestment schedule that conforms to existing data on energy needs.[328]

Reinvestment to Reduce Global Emissions 5 WASH. & LEE J. ENERGY, CLIMATE, & ENV'T 355, 405 (2014) [hereinafter Sewalk].

319. *Id.* at 390.
320. *Id.* at 403–04.
321. *Id.* at 408.
322. *Id.* at 392–93.
323. *Id.*
324. Sewalk, *supra* note 318, at 392–93.
325. *Id.* at 412.
326. *See generally* Hahn & Stavins, *supra* note 217; *see* Metcalf, *supra* note 276.
327. *See* discussion *infra* Sections II–III.
328. *See* Sewalk, *supra* note 318.

B. Why All Consumers are in the Tax Base

The primary reason for the breadth of the tax base in the CTR is to minimize the negative economic impacts of the policy, while producing enough revenue to rebuild the required entire energy infrastructure.[329] The wider the tax base is, the more cost effective any carbon tax or cap and trade system will be.[330] That said, since narrow tax plans cannot isolate particular activities related to emissions and make them particularly expensive, traditional proposals with a wide base may fail to reduce emissions.[331] The CTR relies on changing the power supply from "dirty" power to "clean" power, this substitution rather than dissuasion as the primary mechanism for changing the relationship between emissions and consumption, since energy sources with high emissions rates are replaced by sources with low to no emissions.[332] This substitution is "built in" to the policy, rather than relying on a subjective dynamic.[333]

The principal justification for the wide tax base is a generalized and systemic interpretation of the "polluter pays" principle.[334] The origins of this concept in formal documentation can be traced back to Principle 16 of the Rio Declaration on Environment and Development, stating that the "polluter, should, in principle, bear the cost of pollution, with due regard to the public interest and without distorting international trade and investment."[335] A broad interpretation of this principle allows consumers to be held accountable for their systemic contributions to pollution.[336]

Upstream taxation is likely to be passed on to consumers regardless of the policy.[337] Keeping the base broad will have a similar effect on the general economy but will give upstream producers less incentive to combat the tax politically and seek exemptions due to the automatically shared burden with consumers.[338] Producers do not have to "pass" the cost to consumers via price hikes but directly share the tax burden across the production stream.[339] Thus, the wide tax base is especially effective in the context of this policy.

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329. *Id.* at 391–92.

330. Hahn & Stavins, *supra* note 217, at S269–71.

331. *Id.*

332. *Project Financing an Energy Revolution in the USA*, *supra* note 317 ("substitution rather than discussion as the primary mechanism for changing the relationship between emissions and consumption.").

333. *Id.*

334. *Id.*

335. U.N. Conference on Environment & Development, *Rio Declaration on Environment and Development*, Principle 16, U.N. Doc A/CONF.151/26/Rev.1 (Vol. I) (Aug. 12, 1992).

336. David Pearce & R. Kerry Turner, *Packaging waste and the polluter pays principle: a taxation solution,* 35 ENVT'L PLAN. & MGMT 5 (1992).

337. *See* Hahn & Stavins, *supra* note 217, at S269–71.

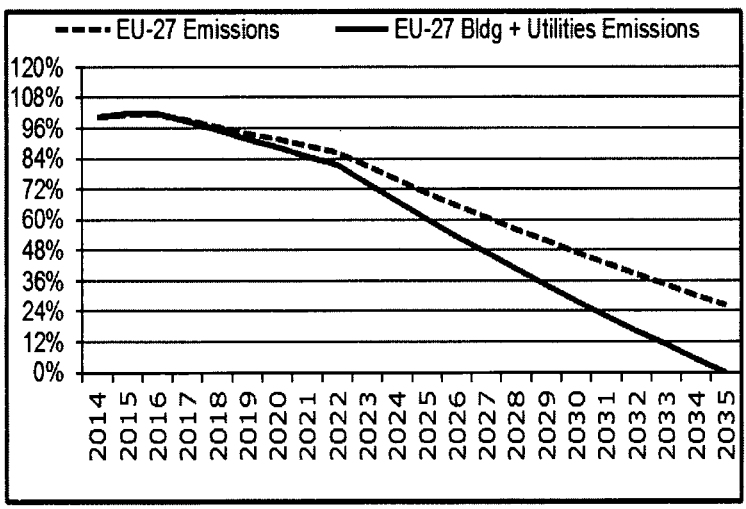
338. Sewalk, *supra* note 318, at 391–92.

339. *Id.* at 391–92.

C. Revenue Creation and Reinvestment

As enumerated in the original work on this policy proposal, tax revenue is collected and immediately invested in creating clean energy plants.[340] These plants are an optimized mix of Solar, Wind, Geothermal, and Nuclear.[341] In the original proposal, the tax is implemented at the modest rate of $5 USD per $MtCO_2e$ and escalates by $5 per ton each year, a linear form that makes adjustment by economic actors particularly easy and allows the tax to rise to $50 per ton within ten years.[342] At reasonable economic growth assumptions and with no assumed technological progress in the clean energy sector, the tax revenue peaks at 1.84% of GDP for the EU.[343] The following figures are taken from this proposal and show the implications for energy production and the economy at large.

Figure 9: Rapidly Declining EU Emissions with a CTR In-Place[344]



340. *Id.* at 393.

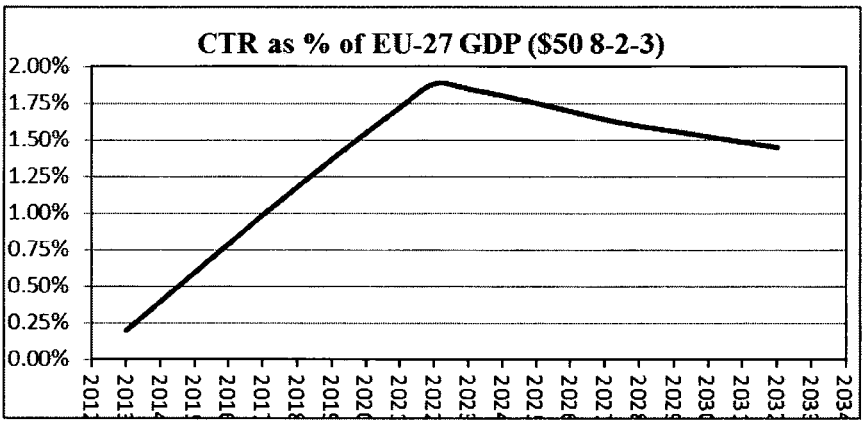
341. *Id.* at 393.

342. *Id.* at 393–94.

343. The United States was modeled as well, with the tax revenue peaking at 2.49% of GDP.

344. Figure 8 created by author calculates the emissions as clean power plants are built thereby displacing power plants that emit carbon. Note that the emissions from buildings and utilities/industry decline rapidly reaching 0 around the year 2035 as fossil fuel plants are displaced by nuclear, solar, wind and deep geothermal power plants, among others. However, remaining auto, truck, bus and airplane emissions would require a shift from fossil fuels to batteries, fuel cells and bio-diesel to continue declining.

Figure 10: Estimated Revenues from CTR as a percentage of the EU-27 GDP (2013-2032)[345]



While this original proposal uses current data to predict time and cost of building out a new energy infrastructure, there is no reason the energy portfolio could not be changed to reflect technological advancements in a particular form of energy or changing energy needs in a particular context.[346]

Flexibility in Reinvestment

There is a deep variety of options when it comes to returning carbon tax revenue equally to all payees, many of which are simply oriented towards discouraging carbon energy use and encouraging thrifty energy use.[347] The achievement of revenue neutrality or mitigation of negative effects may become subjective, and doesn't present any straightforward benefits, i.e. the reduction of actual emissions proactively.[348] The CTR is specifically designed to reinvest in a format that creates guaranteed benefits directly addressing the sectors (energy and transportation) that carbon policies are meant to reform.[349] The energy and transportation sectors offer a specific opportunity, because the rate of negative outputs (carbon emissions), are subject to technological changes.[350] This means that reinvestment into various new energy plants can be optimized by energy generated per unit of emissions, and shifted toward energy sources that become less emissions intensive over time due to technological change.[351] This is a

345. Revenues are calculated at $5/ton of GHG emissions in year 1, rising by $5/ton each year until the carbon tax rate reaches $50/ton in year 10. All goods and services, domestic and imported, are taxed based on emissions intensity. Sewalk, *supra* note 319, at 393–94.

346. *Id.* at 383.

347. *See* Metcalf, *supra* note 276.

348. Sewalk, *supra* note 318, at 12.

349. *Project Financing an Energy Revolution in the USA, supra* note 317, at 15.

350. *Id.* at 18.

351. *Id.*

particular advantage in the context of Europe, where as stated earlier countries have very different energy sectors.

D. The CTR's Legality Under International Trade Agreements

Another non-trivial issue is the legality of the CTR and similar policies under the World Trade Organization (WTO) policies. As discussed above, carbon leakage is an issue that both traditional carbon tax and cap and trade schemes face.[352] To deal with carbon leakage, many policymakers have begun to consider a border tariff dictated by carbon emission rates in the source country.[353] This concept is referred to in the literature as the "border carbon adjustment" (BCA).[354] BCAs are a specialized form of the Border Tax Adjustment (BTA), an established policy norm.[355]

The CTR features a BCA that is an easily implemented policy aspect.[356] Since various entities are taxed at a fixed, linearly increasing rate, the BCA is calculated the same way.[357] To achieve the benefits the CTR touts, this aspect is a vital part of the policy scheme.[358] I discuss the overall economic impacts of BCAs below, but first want to address the legality of such measures under the WTO. Most BCAs have come under scrutiny for being potential cases of "green protectionism", which is essentially protectionist trade measures being masqueraded as climate policy.[359] Environmental and trade groups agree that green protectionism sets a dangerous precedent and must be avoided.[360] Fortunately for the proposal, the BCAs that work best with the CTR have been extensively assessed for WTO comparability, and do not pose a serious threat of being challenged in the WTO.[361] This is because straightforward domestic policies can be easily reflected in such a BCA.[362]

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352. *See* discussion *infra* Section IV.

353. Emil Dimantchev, *To make European climate policy work, we need to put a carbon price on imports*, ENERGY POST (Mar. 5, 2015), http://www.energypost.eu/make-european-climate-policy-work-need-put-carbon-price-imports/.

354. Frédéric Branger & Philippe Quirion, *Would border carbon adjustments prevent carbon leakage and*
heavy industry competitiveness losses? Insights from a meta-analysis of recent economic studies 1 (CIRED,
Working Paper No. 52, 2013).

355. Madanmohan Ghosh, et al., *Border tax adjustments in the climate policy context: CO2 versus broad based GHG emission targeting,* 34 ENERGY ECON. S154 (2012).

356. Stephen Sewalk, *A Carbon Tax with Reinvestment is WTO Compatible,* 25 FORDHAM ENVT'L L. REV. 338, 356 (2014).

357. *Id.* at 381.

358. *Id.* at 387.

359. *Green Protectionism, 5th WTO Ministerial Conference, Cancún, WWF Briefing Series*, WORLD WILDLIFE FOUNDATION, https://www.wto.org/english/forums_e/ngo_e/wwf_greenprotec_e.pdf.

360. *Id.*

361. *See* Sewalk, *A Carbon Tax with Reinvestment is WTO Compatible*, *supra* note 356, at 356–57.

362. Sewalk, *supra* note 318, at 357.

E. The CTR Can and Should Replace the EU-ETS Immediately

The EU is stuck between a rock and a hard place, as deep dependence on Russian natural gas has coincided with a collapsing Cap and Trade scheme. As extensively detailed above, the CTR is a fantastic policy option for improving the relationship between the climate and the international economy.[363] The EU-ETS is fraught with difficulties, including profit mechanisms I failed to mention and complicated implementation risks.[364] Below, I go into detail on the benefits of such a policy to the EU, including novel insights into the ability to create energy independence for the region and the geopolitical ramifications of that achievement.

A CTR is very straightforward, and rapidly reduces carbon emissions.[365] The generation of new energy sources shown above allows the EU to gain natural gas independence from Russia within six to ten years.[366] As previously discussed, the CTR would provide both the principles of benefit certainty by replacing energy sources with high production of carbon emissions, and cost certainty through fixed prices on carbon emissions.[367] This is of special benefit to Europe because of its booming clean energy sector and lack of current bargaining power with Russia. While CTR proposals have focused on various countries in the past, modern geopolitics dictates a special urgency for a. CTR in the EU.[368]

The Carbon Tax with Reinvestment would directly target all carbon consumers, or citizens, through a strategy that focuses on the end consumer, by taxing consumption.[369] All goods and services in Europe, as well as imported goods and services, would carry a tax based on the carbon intensity of a particular product.[370] By holding every person responsible for his or her carbon footprint and establishing a predetermined price on carbon emissions, this tax would secure the principle of cost certainty. The EU-ETS, while currently deeply flawed, showed a political willingness in the EU to accept policies that impose higher costs on various forms of consumption[371] Thus, while a widely applied tax is normally politically difficult to implement, the CTR will make costs resulting from climate policy more predictable, thereby becoming perhaps more politically desirable than the current scenario of costs which rise unpredictably.

In addition, and the most important characteristic of this scheme, the revenue from taxation would be funneled into building new infrastructure for clean and inexpensive energy production, thus providing the principle of benefit certainty. Wind, geothermal, nuclear and solar facilities among others would replace existing power plant infrastructure, while industry, buildings and homes could replace

363. *See* discussion *infra* Section V, A-D.
364. *See* VINCENT GILLES ET AL., *supra* note 206.
365. Sewalk, *A Carbon Tax with Reinvestment is WTO Compatible*, *supra* 356, at 379.
366. *See id.*
367. *Project Financing an Energy Revolution in the USA*, *supra* note 317, at 18.
368. Sewalk, *A Carbon Tax with Reinvestment is WTO Compatible*, *supra* note 356, at 356–58..
369. *Id.*
370. *Id.* at 378.
371. VINCENT GILLES ET AL., *supra* note 206, at 17.

natural gas for heating with clean electric power, thus, further reducing natural gas dependence.[372] As mentioned earlier, the EU is a leader in clean energy technology and production.[373] The simple projections already completed on the EU's implementation of a CTR[374] are thus very conservative, and the powerful conclusions reached in this paper may actually be understating potential benefits in the long run.

In this particular proposal, independence from Russian natural gas is considered an immediate priority. As such, in order to rapidly achieve progress in terms of independence from Russian natural gas and in efforts to lead the world in reducing emissions, the tax rate start would be $50 per ton of CO_2.[375] Any and all revenues collected would be funneled into the rapid deployment of various kinds of clean energy power plants. As earlier stated, the CTR is inherently flexible, and adjustments to reinvestment strategy could be made as Russia becomes a better international cooperative force and as the EU's priorities change, since the simple threat of climate trade policy can effectively change the behavior of national governments relatively quickly.[376] These adjustments are far beyond the scope of this work, which aims to look at the economic and political implications of a simple proposal.

1. Advantages Over Current Approaches (Cost and Benefit Certainty)

As detailed above, carbon tax proposals are generally considered to lack "benefit certainty", as no direct restraints are imposed, but carbon is simply made more expensive to emit.[377] The CTR is a powerful policy tool because it manages to capture both benefit and cost certainty.[378] It can be demonstrated that reinvestment of tax revenue can be used to build out energy infrastructure to decrease and almost eliminate carbon emissions resulting from the sector. This creates the unique advantage of capturing both cost and benefit certainty, which not only makes the CTR a great environmental policy tool but, as detailed in this paper, a powerful foreign policy driver.

2. Economic Sustainability and Stimulus

In addition to the simplicity of an overarching carbon tax with no exceptions, and reinvestment in the future's "green" energy, the CTR boasts several other advantages. Citizens will reap the economic benefits of cheaper energy by utilizing energy that runs from new and more efficient infrastructure. Utility providers will not have to bear the burden of funding new infrastructure, as this will be financed by the tax itself. Additionally, the investment in new

372. *See e.g.,* Sewalk, *A Carbon Tax with Reinvestment is WTO Compatible*, *supra* note 356, at 359.

373. BP, *supra* note 59, at 39.

374. *Project Financing an Energy Revolution in the USA*, *supra* note 317, at 16.

375. *Id.* at 16.

376. *See generally* Barrett, *supra* note 62.

377. *See* Sewalk, *A Carbon Tax with Reinvestment is WTO Compatible*, *supra* note 356, at 376.

378. *See Project Financing an Energy Revolution in the USA*, *supra* note 317.

infrastructure will actually create new jobs, estimated at over 600,000 jobs for construction and over 2.5 million direct, indirect, and induced jobs for the EU.[379] The tax could be easily implemented by utilizing preexisting tax administration and monitoring techniques under the European Commission.[380] Lastly, a Border Tax Adjustment (BTA) could be incorporated within the CTR framework, evening the playing field between domestic producers who are faced with constraints on their GHG emissions and foreign competitors who have no such restrictions.

3. Increased Energy Independence – Exploiting a Hidden Point of Leverage

The inescapable fact is that EU reliance on Russia for energy makes Europe weak. However, this relationship is defined by mutual dependence, thus presenting an opportunity for European leverage. According to the U.S. Energy Information Administration, trade in oil and natural gas earns Russia 70% of its $515 billion USD in annual export revenue and accounts for 52% of the federal budget.[381] Underlining mutual dependence, according to Gazprom, about three-fourths of natural gas exports in 2013 went to Western Europe.[382] Thus, while cutting back on Russian natural gas would seriously increase European autonomy and augment its ability to execute more meaningful sanctions, dependence could seriously threaten the menace of a Russian natural gas power. Elaborated in President Putin's thesis as vital to the nation's economic development, this natural resource power would be diminished as Russia would have no other viable export market.[383]

Initially, the EU should increase U.S. coal imports, as the U.S. has the capacity to rapidly increase coal exports to the EU and would serve as a reliable resource.[384] This would immediately impact Russian natural gas exports, consequently undermining Putin's ability to wield natural gas as a diplomatic weapon. With the tax in place and all revenues being deployed to build new alternative and nuclear power facilities, the EU could become independent from Russia with regards to natural gas within six years (2021) as shown in the figure below.

379. *Project Financing an Energy Revolution in the USA*, *supra* note 317, at 21.

380. *Id.* at 14.

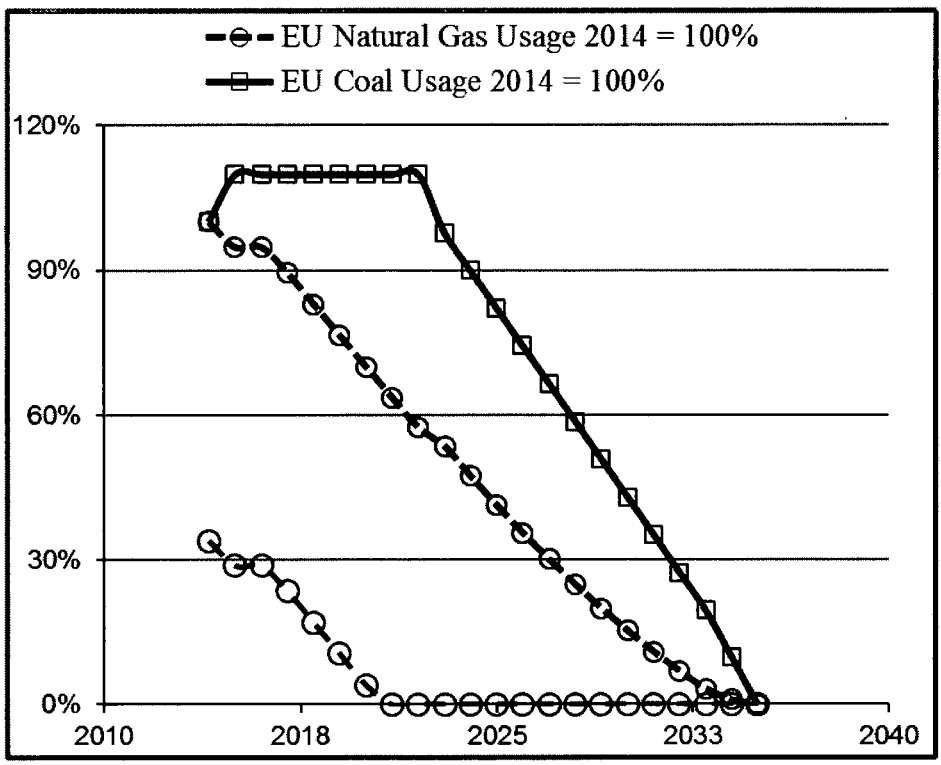
381. Dennis Silverman, *US EIA Data on Russian Natural Gas and Oil*, SOUTHERN CALIFORNIA ENERGY (Mar. 8, 2014), http://sites.uci.edu/energyobserver/2014/03/08/us-eia-data-on-russian-natural-gas-and-oil/.

382. Zuzanna Nowak, Jakub Godzimirski, & Jaroslaw Cwiek-Karpowicz, *Russia's Grand Gas Strategy – the power to dominate Europe?*, ENERGY POST, (Mar. 25, 2015), http://www.energypost.eu/russias-grand-gas-strategy-power-dominate-europe/.

383. *Id.*

384. *See Project Financing an Energy Revolution in the USA*, *supra* note 317.

Figure 11: EU Natural Gas and Coal Usage and Russian Imports under CTR[385]



With the CTR in place, the EU would experience a rapid and sharp decline in emissions and resulting decline in energy imports. By 2021 the EU could be independent of Russian natural gas leaving President Putin an unenviable situation to negotiate with the Chinese to sell natural gas. This policy could very well force Russia to limit its military modernization and focus its energies on modernizing and diversifying the Russian economy.

4. Flexibility

One of the key strengths of this policy is the fact that there is stable revenue creation to reinvest in energy sources. While more programmatic policy approaches may be difficult to adjust to changing realities (like the EU-ETS

385. The author, using the model he developed for his dissertation, modeled the EU-27 adopting the CTR and temporarily increasing coal imports from the U.S.. The result is that coal consumption increases by 10% for a period of approximately 7 years, while clean energy infrastructure is built in the EU. The result is an initial and then continuous decline in Russian gas imports until the early 2020's when Russian gas imports stop.

program) this policy has no predetermined rules for the massive amounts of tax revenue created. To ensure energy and environmental security the EU should adopt the CTR while temporarily increasing coal imports from the U.S., a reliable supplier.[386] Thereby undermining Putin's ability to use natural gas as a weapon. That said, the EU could adjust reinvestments of tax revenue according to Russia's actions to achieve various goals.

Once this policy is adopted there would be a rapid, sustained decline in emissions with a corresponding increase in energy security and independence. Naturally, environmentalists may sharply oppose increased coal consumption, even when temporary. Regardless, coal plants mark the fastest way to become independent of Russian natural gas. Thus this piece of the proposal can be viewed as a potential policy "stick" that can be held as an option contingent upon Russia's actions. Perhaps of greater importance, it would only be temporary and require the refurbishment of existing plants not the construction of new ones. And the result of this policy would still see EU emissions collapse as well as Russian natural gas imports collapse. If the EU stops importing Russian natural gas within seven years and China is not so inclined to import, Russia would be faced with the fact that it needs to reform its economy rather than continue to rely on energy exports.

VI. CONCLUSION

As this paper concludes, Russia has again proven their unreliability as an exporter and their willingness to use the tap weapon.[387] The EU needs to establish that it can create alternatives to Russian natural gas. It is likely that Russia would be compelled to establish security of exports if the tap weapon could be rendered ineffective by alternate options. The CTR creates serious reinvestment prospects, and if Russia did somehow show a commitment not to use the tap weapon, the revenue from the CTR could be reinvested in much needed Russian natural gas infrastructure. Thus, this policy, while providing important benefits to Europe, is something that could benefit the entire region.

The EU's current climate mitigation strategy hobbles the EU from pursuing an independent foreign policy, specifically in respect to implementing a meaningful response to Russia's brazen actions in Ukraine.[388] Particularly alarming is that this reliance is projected to increase,[389] emphasizing the urgency of a new policy. By adopting a new energy and climate strategy, the EU could rapidly achieve energy independence from Russia (six years), no longer need coal or natural gas within twenty years and reduce its emissions upwards of 70% in those same twenty years. Furthermore, this would deprive Russia of its

386. *See Project Financing an Energy Revolution in the USA*, *supra* note 317.

387. Nataliya Vasilyeva, *Russia halts gas supply to Ukraine amid pricing dispute,* ASSOCIATED PRESS (Jul. 1, 2015), http://www.pennenergy.com/articles/pennenergy/2015/06/russia-halts-gas-supply-to-ukraine-amid-pricingdispute.html?cmpid=EnlDailyPetroJuly22015&eid=288685009&bid=1110822&cmpid=EnlWeeklyPetroJuly32015.

388. *Id.*

389. Chyong & Tcherneva, *supra* note 2.

geopolitical energy weapon, postpone the impact of a carbon tax as it is project financed, and would stimulate the EU economy significantly by creating a large influx of jobs thereby reducing the unemployment from 11.9% to under 10%.[390]

390. *See Project Financing an Energy Revolution in the USA*, *supra* note 317.