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America's Energy Policy: Where Energy Consumption is Headed and Why Policy Needs to Change

Andrew Gillespie*

While energy needs continue to increase worldwide, the global community faces profound energy problems.[1] From such significant problems comes the need for an updated United States energy policy aimed at dealing with a changing global energy landscape. The vast majority of energy in the U.S. is created using fossil fuels.[2] The three principal fossil fuels—petroleum, natural gas, and coal—made up more than eighty percent of total U.S. energy consumption in 2015.[3] Mention of the word "coal" evokes an archaic image of the black rock that drove economic change during the Industrial Revolution.[4] This reputation belies the truth. Coal remains a significant fuel in the 21st century, and approximately 1 billion tons of coal produced approximately half of the United States' electricity in 2009.[5] In 2018, coal was the source of roughly 27 percent of total U.S. electricity generation.[6]

Despite these facts, other fuel sources are projected to rise in popularity and usage, alongside an increase in world energy consumption.[7] In 2017, The U.S. Energy Information Administration ("EIA") projected that world energy consumption

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*Notes Editor, K.Y. J. EQUINE, AGRI., & NAT. RES. L., 2019-2020. B.A. 2017, University of Kentucky; J.D. expected May 2020, University of Kentucky College of Law.

[1] *Global Energy Demand Rose by 2.3% in 2018, Its Fastest Pace in the Last Decade*, INT'L ENERGY AGENCY (Mar. 26, 2019), https://www.iea.org/newsroom/news/2019/march/global-energy-demand-rose-by-23-in-2018-its-fastest-pace-in-the-last-decade.html [https://perma.cc/9JMM-K6WR].

[2] *U.S. Energy Facts Explained*, U.S. ENERGY INFO. ADMIN., https://www.eia.gov/energyexplained/?page=us_energy_home [https://perma.cc/89PE-J35J] (last updated August 28, 2019).

[3] *Fossil Fuels Still Dominate U.S. Energy Consumption Despite Recent Market Share Decline,* U.S. ENERGY INFO. ADMIN. (July 1, 2016), https://www.eia.gov/todayinenergy/detail.php?id=26912 [https://perma.cc/UF66-YSKB].

[4] *Why We Still Mine Coal*, NAT'L PUB. RADIO, INC., (Apr. 8, 2010, 3:57 PM), https://www.npr.org/templates/story/sotry/php?storyId=125694190 [https://perma.cc/5E3C-BP5C].

[5] *Id.*

[6] *Coal Explained*, U.S. ENERGY INFO. ADMIN., https://www.eia.gov/energyexplained/index.php?page=coal_use [https://perma.cc/U68K-RP4E] (last updated May 9, 2019).

[7] *See* U.S. ENERGY INFO. ADMIN., INTERNATIONAL ENERGY OUTLOOK 2017, at 20 (2017), https://www.eia.gov/outlooks/ieo/pdf/0484(2017).pdf [https://perma.cc/M3JE-84WS] ("Although renewable energy and nuclear power are the world's fastest growing forms of energy, fossil fuels are expected to meet much of the world's energy demand.").

will increase by twenty-eight percent through 2040.[8] With the increase in world energy consumption and projected growth in the use of renewable energy sources worldwide, some countries are actually expected to increase their use of coal and other fossil fuels.[9] "Clean coal," which refers to a "variety of technologies that reduce the emission of pollutants, through treatment or processing of the coal, changing the way it is burned, or sequestering the pollutants," should allow for even more future coal consumption.[10] The economic prospects of advanced coal technologies that possess higher efficiency, in combination with the lower cost of techniques to capture carbon emissions, should shape the energy policy of the U.S. for years to come.[11]

Notwithstanding coal production more than doubling over the past sixty years, a moderate decline in U.S. coal output began in 2009.[12] Despite this moderate decline, in 2018, the EIA projected that the U.S.'s coal consumption will remain more or less constant in the future.[13] Other parties, including the Trump administration and American banks, remain hopeful that coal can make a resurgence within the U.S.[14] As a result of increased coal exports in 2017, the U.S. experienced a slight reverse in the long decline in U.S. coal production.[15] Importantly, fossil fuels, along with nuclear energy, are projected to supply about eighty-three percent of net global energy consumption by 2040.[16] Although worldwide coal consumption is projected to remain near its current level through 2040, China is projected to decline in its coal usage, while India is projected to increase its coal usage, and the U.S. is projected to

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[8] *Id.*

[9] *Id.*

[10] NAT'L PUB. RADIO, INC., *supra* note 4.

[11] Mark Perry, *The Future of Coal, The Economic Prospects of Advanced Coal Technologies Have Never Seemed so Promising*, U.S. NEWS (Apr. 27, 2017, 8:00 AM), https://www.usnews.com/opinion/economic-intelligence/articles/2017-04-27/the-future-of-coal-technology-is-promising [https://perma.cc/C7JC-AY3Y].

[12] Charles D. Kolstad, *What Is Killing the US Coal Industry?*, STANFORD INST. FOR ECON. POL'Y RES. (Mar. 2017), https://siepr.stanford.edu/research/publications/what-killing-us-coal-industry [https://perma.cc/SQB7-JAX6].

[13] *EIA Projects that U.S. Coal Demand Will Remain Flat for Several Decades*, U.S. ENERGY INFO. ADMIN. (Mar. 30, 2018), https://www.eia.gov/todayinenergy/detail.php?id=35572# [https://perma.cc/9QLH-45ZC].

[14] *See* Patrick McCully, *Trump's New Coal Policy is Dangerous*, THE HILL (Aug. 29, 2018, 10:20 AM), https://thehill.com/blogs/congress-blog/energy-environment/404140-trumps-new-coal-policy-is-dangerous [https://perma.cc/LY7U-MBF2].

[15] *Id.*

[16] *See* U.S. ENERGY INFO. ADMIN., *supra* note 7, at 19–20.

remain near its current coal consumption level or slightly below.[17] Despite a steady, albeit slight, projected decrease in coal usage by China from 2015 to 2040, the country is projected to remain the world's largest coal user by a wide margin.[18] With extensive coal and fossil fuel usage still predicted for the future, U.S. energy policy should shift its focus from domestic coal production to a gradual focus on coal exports.

With the proper use of clean coal technologies, carbon capture, and energy exports in conjunction with the projected worldwide energy use, the U.S. can look to the future of energy with alternative, and ultimately better, energy policies. This Note explains why the shift in U.S. coal production serves as a backdrop for a new regulatory energy policy in which the U.S. is a prominent exporter of energy, especially of underutilized domestic fossil fuels. Part I discusses the history and current state of U.S. energy policy, focusing not only on domestic policies but also on energy policies concerning global energy consumption. Part II explores possible uses of coal and other fossil fuel deposits found in the U.S., including domestic consumption, clean energy, and energy export, which form a basis for future policy considerations. Finally, Part III argues how alternate energy policies and regulatory schemes could ensure that the U.S. remains a leader in international energy markets and could reverse the decline in fossil fuels felt throughout the United States.

I. EXAMINING PAST AND PRESENT U.S. ENERGY POLICY

Because of steady fossil fuel production and use, energy policy in the U.S. did not historically possess any degree of urgency compared to the current energy climate in which energy consumption needs rise while fossil fuel reserves decline.[19] From 1971 to 2013, fossil fuels generated about two-thirds of the world's total electricity.[20] Despite a historic reliance on fossil fuels for total

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[17] *Id.* at 63–64.

[18] *Id.*

[19] William R. Childs, *Energy Policy and the Long Transition in America*, THE OHIO STATE UNIVERSITY (2011), https://origins.osu.edu/article/energy-policy-and-long-transition-america [https://perma.cc/YM5P-49KK].

[20] ORG. FOR ECON. COOPERATION & DEV., FACTBOOK 2015-2016: ECONOMIC, ENVIRONMENTAL AND SOCIAL STATISTICS 102 (2016), https://www.oecd-ilibrary.org/docserver/factbook-2015-en.pdf?expires=1572731040&id=id&accname=guest&checksum=C8D73E3BAE44365DC4603F94A99B624B [https://perma.cc/WY8M-E2TF].

electricity, "the share of electricity production from fossil fuels has gradually fallen from [seventy-four percent] in 1971 to [sixty-seven percent] in 2013."[21]

Although concern over U.S. energy supply and U.S. energy policy is not unheard of, significant price increases and a worldwide energy crisis did not occur until the 1973 Arab Oil Embargo.[22] In 1950, the U.S. produced fifty-two percent of the world's crude oil.[23] Shockingly, by 1997, that number fell to ten percent.[24] As a result of the 1973 Arab Oil Embargo, and the crisis it created, President Ford signed the Energy Policy and Conservation Act, which had the effect of protracting oil price controls, establishing automobile fuel economy standards, and authorizing the creation of an emergency oil reserve.[25]

While the 1973 Oil Embargo and other oil-related issues do not directly impact the discussion of coal or its history in the U.S., the oil crisis and its long-lasting effects did have other indirect energy sector consequences. After the regulation of energy following the oil crisis, President Reagan substantially deregulated the energy sector allowing an alternative energy market to be created organically and to allow domestic oil production to increase.[26] Reagan's free-market approach differed considerably from the previous regulatory schemes and instead sought to treat energy as any other free-market economy with little restriction.[27] The Reagan Administration's free-market approach had the goal of naturally creating an alternative energy market, but this period actually "discouraged energy efficiency and the use of alternative fuels" due to the fact that no energy crisis occurred and there was no rush to accomplish energy independence.[28]

After the deregulation of the Reagan Era, the Clinton Administration sought to impose its own energy policy by focusing on regulations; the Clinton Administration had a comprehensive

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[21] *Id.*

[22] ENERGY INFO. ADMIN., 25TH ANNIVERSARY OF THE 1973 OIL EMBARGO (1998), https://digital.library.unt.edu/ark:/67531/metadc708001/m2/1/high_res_d/663603.pdf [https://perma.cc/N3TE-7VPX].

[23] *Id.*

[24] *Id.*

[25] *Our History,* OFF. OF FOSSIL ENERGY, https://www.energy.gov/fe/about-us/our-history [https://perma.cc/SZ67-YSSD].

[26] Maya Kaplan, *Denmark's Achievement of Energy Independence: What the United States Can Learn*, 18 CARDOZO J. INT'L & COMP. L. 723, 735–36 (2010).

[27] *Id.*

[28] *Id.*

and well-intended energy policy, but it focused intensely on the transportation sector rather than on fossil fuels and other sources of energy.[29] The Clinton era saw a decreased focus on energy policy and oil, mostly as a result of a secure market in tandem with relatively low oil prices.[30]

In 2005, President Bush signed the Energy Policy Act of 2005.[31] This policy focused on promoting alternative energy sources through tax incentives, including "$4.3 billion for nuclear power, $2.8 billion for fossil fuel production… $1.6 billion in tax incentives for investments in clean coal facilities, $1.3 billion for conservation and energy efficiency." [32] Rather than focusing on increasing domestic oil production, the Energy Policy Act of 2005 began to shift the focus toward developing alternative energy sources and, perhaps more importantly, instituted a considerable tax incentive for the use of clean coal.[33] Tax incentives for the investment in and use of clean coal should be a priority for future U.S. energy policy and regulation.

The U.S. saw one of the most anti-energy administrations under President Barack Obama, who introduced restrictive policies and regulations on fossil fuel industries.[34] For example, during President Bush's final year in office in 2008, the U.S. produced 1.06 billion metric tons of coal, but by 2015, U.S. coal production had dropped to 813 million metric tons under President Obama.[35] As of 2016, the EIA reported that domestic coal production had declined thirty-seven percent during President Obama's term.[36] Instead of using the fossil fuel industry to the advantage of the U.S., President Obama oversaw a rise in biofuel production, wind power, and solar power, among others.[37] The domestic growth in these sectors due to the forced tilt away from fossil fuels under President Obama, however, did not completely

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[29] *Id.* at 736–38.
[30] *Id.* at 738–39.
[31] *Id.* at 739.
[32] Kaplan, *supra* note 26, at 739.
[33] *Id.* at 739–40.
[34] Robert Rapier, *President Obama's Energy Report Card*, FORBES (Dec. 12, 2016, 7:30 AM), https://www.forbes.com/sites/rrapier/2016/12/12/president-obamas-energy-report-card/#23e82f3a554e [https://perma.cc/GYR2-HZGA].
[35] *Id.*
[36] *Id.*
[37] *Id.*

close the door on the production and exportation of coal and other fossil fuels. [38]

The Trump Administration is seeking to bolster coal once again in the U.S., but may not be using the most successful strategy. The Trump Administration's proposed energy rule, the Affordable Clean Energy Rule, purports to remove the ability to set power plant emissions standards from the federal government and instead lets individual states set the standard.[39] The rule allows states to develop individual plans to cut pollution, which may be beneficial to some states, but ultimately does not address any long term energy concerns.[40] The Affordable Clean Energy Rule would also reduce the regulation of coal plants.[41] While individual state plans probably will not result in a stable energy policy, less regulation for coal plants in general could aid in the future export of coal to countries such as China, the biggest consumer of coal.[42]

Perhaps the most significant flaw of U.S. energy policy since the 1973 Oil Embargo has been its struggle to adapt over time.[43] By utilizing the coal and fossil fuel reserves located within the U.S., in conjunction with the large coal and fossil fuel usage still predicted for the future, U.S. energy policy should shift its focus from domestic coal production to a gradual focus on coal exports. The goal of an expanding and adaptive energy policy can be accomplished by first understanding the current and future uses of domestic coal and fossil fuels, which Part II will discuss.

II. OTHER USES FOR DOMESTIC COAL AND FOSSIL FUELS

A. Exporting Domestic Coal to Foreign Countries

Coal is not the dying industry it is often made out to be.[44] Eighteen U.S. states still use coal as their primary source of power, around thirty percent of U.S. power comes from coal, and Asia

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[38] *See id.* ("Following eight straight years of declines during the Bush Administration, oil production rose for the first seven years of the Obama Administration.").

[39] McCully, *supra* note 14.

[40] *Id.*

[41] *Id.*

[42] NAT'L PUB. RADIO, INC., *supra* note 4.

[43] Kaplan, *supra* note 26, at 731–32.

[44] Jude Clemente, *The U.S. Coal Export Boom To Asia*, FORBES (Oct. 7, 2018, 7:25 PM), https://www.forbes.com/sites/judeclemente/2018/10/07/the-u-s-coal-export-boom-to-china/#486e59463454 [https://perma.cc/FQ59-SABA].

increasingly turns to the U.S. to satisfy its coal needs.[45] In light of these facts, the statement "coal is dead" holds little water.[46] China is the top consumer of coal worldwide, "burning more than the U.S., the European Union, and Japan combined."[47] Because of this, and with India's coal consumption on the rise, the U.S. can structure an export policy that incentivizes the export of domestic coal to Asian countries.[48] China and India seem to be building coal capacity as fast as possible, and the trend of increasing coal consumption is predicted to continue.[49]

Asia continues to turn to the U.S.—which is still the third-largest coal producer in the world—to supply its coal.[50] The overwhelming reliance of both China and India on their domestic coal resource is unsustainable – "China accounts for just [thirteen percent] of global coal reserves but [fifty-one percent] of consumption."[51] The unsustainability of China and India's coal consumption habits, when combined with the immense domestic reserves held in the U.S., paints an dramatic picture for world energy consumption.

Domestic coal reserves in the U.S. appear to be so vast and abundant that exploration for the resource appears neglected.[52] Research shows a 360-year supply of coal in the U.S., which would support an expanding export market for a significant amount of time.[53] Moreover, the price for U.S. coal in Asia is astronomically higher than the domestic price; a ton of coal could sell for about $1,300 in China, but only cost around thirteen American dollars.[54] Therefore, due to the high demand for power in Asia, especially in the form of coal, it is clear that foreign markets are a perfect fit for the immense reserves of U.S. coal.[55] Despite the large demand for coal in China, the U.S. currently supplies more coal to India than

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[45] *Id.*

[46] *Id.*

[47] Ross Taylor, *Exporting Coal, Importing Pollution: Can the Consumption of Coal be Ignored Under NEPA and SEPA Analysis When Burned Overseas*?, 4 WASH. J. ENVTL. L. & POL'Y 212, 220 (2014).

[48] U.S. ENERGY INFO. ADMIN., *supra* note 7, at 64.

[49] *Id.*

[50] Clemente, *supra* note 44.

[51] *Id.*

[52] Berkeley Lab, *The Energy Problem: What the Helios Project Can Do About It*, YOUTUBE (Mar. 12, 2008), http://www.youtube.com/watch?v=pLr4YbStc0M [https://perma.cc/57HH-JG8Z].

[53] Clemente, *supra* note 44.

[54] Taylor, *supra* note 47, at 220.

[55] *Id.* at 217–18.

China, even though China is the world's largest consumer and importer of coal.[56] A successful and long-lasting energy policy should include more exporting of domestic coal to China, where the demand for U.S. coal is projected to remain high.[57]

One possible way to exploit the demand for U.S. coal in Asia involves a proposal to build coal export terminals along the West Coast.[58] The U.S. can use these terminals to export coal to Asia in an economically efficient manner, and in turn, benefit the U.S.[59] Since China and India are the largest coal consumers in the world, and they are both projected to maintain high rates of coal consumption in the near future, export terminals along the West Coast of the U.S. could be extremely beneficial.[60]

B. Carbon Capture and Storage, and other Clean Coal Technologies

"Historically, energy from plentiful and affordable supplies of fossil fuels," such as coal, "has been considered one of the most important enablers of domestic economic growth."[61] The long term and widespread use of these resources resulted in the release of gigatons of CO_2 into the atmosphere.[62] While generating a large portion of the world's electricity, fossil fuels, especially coal, are also the most carbon-intensive sources of energy.[63] Fossil fuels also contribute significantly to more extreme temperature swings and could permanently impact the Earth's climate.[64] The top coal-producing nations, namely the U.S., China, and India, each hold domestic coal reserves so abundant that exploration for the resource appears neglected, however, the use of these deep reserves could prove to be damaging.[65]

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[56] Clyde Russell, *U.S. Coal Exports Surge, But Thank China, Not Trump: Russell*, REUTERS (July 31, 2017 12:12 AM), https://www.reuters.com/article/us-column-russell-coal-usa/u-s-coal-exports-surge-but-thank-china-not-trump-russell-idUSKBN1AG0CC [https://perma.cc/RXZ9-9T4M].

[57] Clemente, *supra* note 44.

[58] Taylor, *supra* note 47, at 217.

[59] *Id.* at 217–18.

[60] U.S. ENERGY INFO. ADMIN., *supra* note 7, at 64.

[61] Victor K. Der, *Carbon Capture and Storage: An Option for Helping to Meet Growing Global Energy Demand While Countering Climate Change*, 44 U. RICH. L. REV. 937, 938 (2010).

[62] *Id.*

[63] *Id.*at 937–38.

[64] *Id.* at 940.

[65] Berkeley Lab, *supra* note 52.

Fortunately, according to a White House report in 2016, carbon capture and sequestration could reduce the U.S.'s greenhouse gas emissions by eighty percent by 2050.[66] Clean coal technologies, like carbon capture, must be utilized more fully to reach such a successful reduction in greenhouse gasses, and to provide a bigger incentive for exporting to Asia.[67] The carbon capture and storage process is a family of technologies and techniques that enable the capture of carbon dioxide from fuel combustion, among other sources of carbon dioxide; it is vital for reducing greenhouse gas emissions.[68] Carbon capture works by capturing CO_2, compressing and transporting it, and injecting it into suitable permanent sites deep underground to achieve geologic storage.[69] The CO_2, which is in a liquid state during transport and injection, is transported by pipeline to an injection site.[70] After injection, the CO_2 seeps into porous spaces in surrounding rock, and over time it eventually dissolves.[71] Estimates show there is enough storage to hold CO_2 emissions for millions of years, making it a viable option for comprehensive energy policy.[72]

A variety of other clean coal technologies, apart from carbon capture, also exist. Cleaning coal by washing is one alternative for reducing the emission of ash and sulfur dioxide that is caused by burning coal.[73] Other technologies, like electrostatic precipitators and fabric filters, aid in the cleaning of coal.[74] Low-NOx burners are a technology that allow coal plants to reduce nitrogen oxide emissions.[75] However, the most widely used and supported cleaning method is carbon capture (also called sequestration),

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[66] Wendy B. Jacobs & Michael Craig, *Legal Pathways to Widespread Carbon Capture and Sequestration*, 47 ENVTL. L. REP. 11022, 11022 (2017).

[67] *'Clean Coal' Technologies, Carbon Capture & Sequestration*, WORLD NUCLEAR ASS'N (Nov. 2018), http://www.world-nuclear.org/information-library/energy-and-the-environment/clean-coal-technologies.aspx [https://perma.cc/BS74-VYKA].

[68] *Carbon Capture, Utilisation and Storage, A Critical Tool in the Climate Energy Toolbox*, INT'L ENERGY AGENCY, https://www.iea.org/topics/carbon-capture-and-storage/ [https://perma.cc/382G-VR6W].

[69] Der, *supra* note 61, at 951.

[70] *Id.*

[71] *Id.*

[72] *Id.* at 951–53.

[73] WORLD NUCLEAR ASS'N, *supra* note 67.

[74] *Id.*

[75] *Id.*

which is the disposal of liquid carbon dioxide, once captured, into deep geological strata.[76]

The policy behind the storage of emissions through carbon capture involves legal issues, as well as public expectations, public health, population safety, and environmental concerns.[77] The EPA's Underground Injection Control Code contains a regulatory framework for the storage of emissions, as well as proposed rules for geologic sequestration wells.[78] However, the U.S. does not have a legal framework tailored specifically to carbon capture.

As Part III addresses more thoroughly, clean coal technologies possess limitations, which is why government incentives must be a part of the new and expansive energy policy for future energy consumption and export.[79] The use of carbon capture and the benefits associated with it would allow the U.S. to utilize more of its fossil fuel reserves for exportation to other countries without harming the environment.[80] Although the costs of carbon capture are high, a sound coal export strategy coupled with a carbon capture incentive program would create a lasting energy policy for the future.

III. ALTERNATE POLICY AND REGULATORY SCHEME

A new, expansive, and flexible energy policy built to adequately respond to future energy consumption and energy needs should not feature strict deregulation as under the Reagan and Trump Administrations.[81] However, this new policy should also refrain from employing the strict fossil fuel regulations used by the Obama Administration.[82] Instead, policymakers should use the Bush Administration's approach as a starting point, specifically focusing on the Energy Policy Act of 2005 and its tax incentives and benefits for clean coal and fossil fuel production.[83]

Just as the Energy Policy Act of 2005 included extensive tax benefits for specific conduct, better energy policy should reintroduce robust tax incentives for clean fossil fuel production,

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[76] *Id.*
[77] Der, *supra* note 61, at 961.
[78] *Id.*
[79] *See* WORLD NUCLEAR ASS'N., *supra* note 67.
[80] *See id.*
[81] Kaplan, *supra* note 26, at 736; McCully, *supra* note 14.
[82] Rapier, *supra* note 34.
[83] Kaplan, *supra* note 26, at 739.

and more specifically, for using carbon capture and clean coal.[84] The 2005 Act introduced a $2.8 billion incentive for fossil fuel production, as well as a $1.6 billion incentive for investment in clean coal facilities.[85] Any new regulation should provide even greater incentives. There is also a need to incentivize the export of coal to Asia. This particular incentive could create growth and an economic advantage for the U.S., so much so that the generous tax benefits would most likely offset the economic gain created through the export of coal. Therefore, clean coal must continue to be incentivized by substantial tax breaks and credits.

A. Coal Export Policy

The export of coal to Asia must be incentivized to take full advantage of coal reserves in the U.S.,[86] and the growing levels of energy consumption in Asia.[87] Some proposals have discussed the possibility of coal terminals along the West Coast, which would receive coal mined in Montana and Wyoming.[88] While this is a starting point for an extensive export policy, the incentives for such an ambitious program must extend to areas outside Montana and Wyoming.

As of January 2018, the demonstrated reserve base in the U.S. contained about 475 billion short tons of coal.[89] Also measured were the recoverable coal reserves; this represents the quantity of coal that can be recovered from existing coal reserves at producing mines.[90] In the U.S., among the recoverable coal reserves at producing mines, Illinois, Kentucky, Pennsylvania, Wyoming, and West Virginia have the highest coal reserves, each one holding over 1 billion short tons.[91] Notably, Wyoming contains the largest coal reserves at almost 6 billion short tons.[92] Based on this data, any

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[84] *See id.*

[85] *Id.*

[86] Berkeley Lab, *supra* note 52.

[87] U.S. ENERGY INFO. ADMIN., *supra* note 7, at 19–20, 63–64.

[88] Taylor, *supra* note 47, at 214.

[89] *U.S. Coal Reserves*, U.S. ENERGY INFO. ADMIN. (Nov. 2, 2018), https://www.eia.gov/coal/reserves/ [https://perma.cc/9GSK-GKRY].

[90] *Id.*

[91] *Table 14. Recoverable Coal Reserves at Producing Mines by State, 2017 and 2016*, U.S. ENERGY INFO. ADMIN., https://www.eia.gov/coal/data.php [https://perma.cc/D894-8ABB] (directing towards the "Reserves" tab and then to the "At producing mines by state" tab for the PDF).

[92] *Id.*

incentives for mining and exporting need to extend to include the Appalachian states at the very least.

Access to some coal reserves, however, is limited, presenting an opportunity for stronger tax incentives.[93] Property rights, land-use conflicts, physical restrictions, and environmental restrictions pose difficulties to the access of all coal reserves.[94] The EIA has estimated that only about fifty-three percent of the demonstrated reserve base may be accessible for mining.[95] Although some physical accessibility issues may be inevitable, the implementation of vital tax incentives could overcome the barriers posed by property rights and land-use conflicts. Robust tax credits could potentially encourage property owners to allow the use of their coal reserves, therefore diminishing the problem that property rights pose.

The effects caused by a new coal exportation incentive policy may require governmental involvement. A program concerning both the effects on the economy and the environment as ambitious as the exportation of coal to Asia from the U.S. would not be "immeasurable, unforeseeable, or uncontrollable."[96] Scientific and economic data can establish the broader effects of such a program.[97] Coal Exportation and its effects must be analyzed and explained under various legal frameworks, including the National Environmental Policy Act, which requires that environmental impact statements of the proposed action be created and reviewed by the EPA.[98]

Proceeding with such a policy without first investigating the environmental impact and following legal guidelines, such as the National Environmental Policy Act, is not advisable.[99] Most legal opposition would probably come in response to environmental concerns, but climate change policy has developed slowly in U.S. courts.[100] The Supreme Court has offered some guidance, albeit

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[93] *U.S. Coal Reserves*, *supra* note 89.
[94] *U.S. Coal Reserves*, *supra* note 89.
[95] *Id.*
[96] Taylor, *supra* note 47, at 245.
[97] *Id.*
[98] *National Environmental Policy Act*, U.S. ENVTL. PROT. AGENCY, https://www.epa.gov/nepa [https://perma.cc/4CPG-QRVA].
[99] Taylor, *supra* note 47, at 246.
[100] *Id.* at 238.

limited.[101] In *Department of Transportation v. Public Citizen*, the Court stated that a "reasonably close causal relationship between the environmental effect and the alleged cause" must exist.[102] Additionally, the Supreme Court found that climate change from greenhouse gas emissions is well documented and is caused, at least in part, by human conduct, and therefore, government entities should regulate pollutants.[103] In *Baltimore Gas & Electric Company v. Natural Resources Defense Council, Inc.*, the Court also stated that its primary role in the National Environmental Policy Act review process is to ensure that an agency has seriously examined the environmental consequences of any proposed action; additionally, the Court will generally not reverse agency decisions under the National Environmental Policy Act unless those decisions are arbitrary and capricious.[104]

The cases decided by the Supreme Court do not definitively answer how a policy that would export coal to Asian countries should consider climate change, but they do offer limited guidance for future policy enactments. Additionally, it is unclear what legal doors are opened or shut regarding climate change brought about by foreign government agencies in an exporting program such as this. Even if domestic government agencies such as the EPA abide by the Court's decisions and the National Environmental Policy Act while exporting coal to Asia, what little guidance exists will not offer any additional help.

Despite the questionable legal framework of a coal export program, climate change should be of minimal concern for a tax incentive program that targets incentivizing coal exportation. Because China and India are expected to continue their coal consumption regardless of where the coal comes from, the economic well-being of the U.S. that can come from this program due to its abundant domestic coal reserves should be the priority.[105] Again, the price for U.S. coal in Asia is exorbitantly higher than the domestic price.[106] Thus, due to the high demand for U.S. coal in Asia, it is clear that foreign markets are a perfect

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[101] *See, e.g.*, Dep't of Transp. v. Pub. Citizen, 541 U.S. 752, 767 (2004); Mass. v. Envtl. Prot. Agency, 549 U.S. 497, 552 (2007); Balt. Gas and Elec. Co. v. Nat. Res. Def. Council, Inc., 462 U.S. 87, 97–98 (1983).

[102] *Dep't of Transp.*, 541 U.S. at 767 .

[103] *Mass. v. Envtl. Prot. Agency*, 549 U.S. at 552.

[104] *Balt. Gas and Elec. Co.*, 462 U.S. at 97–98 .

[105] Berkeley Lab, *supra* note 52.

[106] Taylor, *supra* note 47, at 223.

destination for the immense reserves of U.S. coal.[107] A successful energy policy that would remain pliable for an extended period should include more exportation of domestic coal to China, where the demand for U.S. coal is projected to remain high, and should not focus as heavily on the environmental impact under the National Environmental Policy Act and similar regulations.[108]

C. Clean Coal and Carbon Capture Policy

Despite many concerns that coal lacks long-term staying power, coal continues to be the foundation of power generation around the world, and the abandonment of coal production is not a practical option; this is why an export program is extremely vital to a new energy policy.[109] As previously discussed, determining the best way to extract coal's energy in an environmentally responsible manner is the main challenge to coal production.[110] Thus, a popular policy strategy would be one that encourages the use of new clean coal power plant technologies, in conjunction with the mining and exporting of coal.[111]

Numerous tax incentives would promote investment in fuel development.[112] Many studies show that "the effective marginal tax rate… is much lower for oil, gas, and coal development" compared to other properties.[113] This means that the tax provisions that reduce the returns on new investments are more efficient when they are lower.[114] Although federal tax revenue is expected to fall by almost $11.6 billion by 2021 due to the three largest energy tax incentives, the reduced tax revenue can be made up for by implementing other uses of coal previously discussed.[115]

Tax credits for clean coal may not directly encourage consumers to use less electricity, but the other benefits outweigh

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[107] *Id.* at 221.

[108] Clemente, *supra* note 44.

[109] *See* PEW CTR. ON GLOBAL CLIMATE CHANGE, DEVELOPMENT OF A POLICY FRAMEWORK FOR CO_2 CARBON CAPTURE AND STORAGE IN THE STATES 2 (2008), https://www.c2es.org/site/assets/uploads/2008/09/development-policy-framework-co2-carbon-capture-and-storage-states.pdf [https://perma.cc/2JL5-SQYT].

[110] *Id.* at 2.

[111] *Id.*

[112] *Tax Policy Center Briefing Book, Key Elements of the U.S. Tax System*, TAX POLICY CENTER (2016), https://www.taxpolicycenter.org/briefing-book/what-tax-incentives-encourage-energy-production-fossil-fuels [https://perma.cc/5ZPA-GT4D].

[113] *Id.*

[114] *See id.*

[115] *Id.*

any slack from decreases in electricity consumption.[116] Developing clean coal technologies can improve the efficiencies at coal-burning power plants, which in turn can lead to the burning of less coal.[117] In the past, critics of energy bills, including clean coal credits, complained that the support for clean coal technology would not result in any more energy, nor would it sustain a steady energy supply.[118] Although incentives and credits on clean coal may undermine any incentives for coal conservation, conservation should not be the key focus of U.S. energy policy.[119] For a comprehensive and adaptive energy policy, the U.S. must shed the idea of conserving coal reserves in favor of exploiting them.

Not only should coal and clean coal technology itself be incentivized, but any other useful byproducts from the process should also be encouraged. For example, coal producers can reuse waste products productively.[120] For instance, in 1999, the E.U. used half of its coal fly and bottom ash in building materials to replace cement where possible.[121] Captured carbon dioxide gas can be used for things as varied as building materials and enhanced oil recovery.[122] In an oil recovery approach, carbon dioxide and other materials reduce the viscosity of the oil, enhancing the flow to recovery wells.[123] A new energy policy should include other uses for coal byproducts, in conjunction with a large-scale export program to Asia.

Tax incentives should also be implemented for general research and development into clean fossil fuels. International Energy Agency member governments "spent less than $400 million per year on [carbon capture] up to 2008," before increasing to over $1 billion between 2009 and 2013.[124] This government expenditure subsequently dropped again in 2014.[125] The amount spent on carbon capture and research and development cannot continue to

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[116] Douglas Jehl & Lizette Alvarez, *Conservation Bill Benefits Coal Industry, Critics Say*, N.Y. TIMES (July 25, 2001), https://www.nytimes.com/2001/07/25/us/conservation-bill-benefits-coal-industry-critics-say.html [https://perma.cc/GPD7-ZNWB].

[117] *Id.*

[118] *Id.*

[119] *See id.*

[120] WORLD NUCLEAR ASS'N., *supra* note 67.

[121] *Id.*

[122] *Id.*

[123] *Id.*

[124] *Id.*

[125] *Id.*

decline if a flexible energy policy geared toward future energy needs is implemented.

With an energy policy providing strong tax credits, clean coal technologies, specifically carbon capture, could be utilized in a much broader sense to reach a meaningful reduction in greenhouse gasses and to provide a notable incentive for exporting to Asia.[126] Carbon capture, storage technologies, and carbon dioxide capture techniques are vital for reducing emissions.[127]

Incentive policies for the deployment and use of carbon capture and storage generally aim to overcome technical and commercial barriers, and, in addition, support technology learning.[128] Carbon capture is a high-cost option, and will most likely continue to be expensive in the future.[129] The private sector may not invest in carbon capture because of this high cost at first, but over time the private sector's willingness to invest may improve.[130] Research and development can also reduce costs, which in turn will increase the interest in carbon capture and investment in carbon capture technologies.[131]

Incentives for companies, individuals, and investors to begin and to continue capturing CO_2 will only benefit the U.S.'s energy outlook and will complement the export of domestic coal to Asian countries.[132] Because estimates show there is enough storage to hold CO_2 emissions for many centuries, incentivizing carbon capture and storage is a viable option for a comprehensive energy policy.[133]

Government involvement is especially crucial to carbon capture in its initial stages, and a comprehensive energy policy should consider this.[134] Until government subsidies and incentives garner widespread public support, these incentives will remain

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[126] *Carbon Capture*, CTR. FOR CLIMATE AND ENERGY SOL., http://www.world-nuclear.org/information-library/energy-and-the-environment/clean-coal-technologies.aspx [https://perma.cc/4R7P-FV9S].

[127] INT'L ENERGY AGENCY, *supra* note 68.

[128] INT'L ENERGY AGENCY, A POLICY STRATEGY FOR CARBON CAPTURE AND STORAGE 8 (2012), https://www.iea.org/publications/freepublications/publication/policy_strategy_for_ccs.pdf [https://perma.cc/XZ35-UBG8].

[129] *Id.*

[130] *Id.*

[131] *Id.*

[132] Der, *supra* note 61, at 951, 955.

[133] *Id.* at 952–53.

[134] A POLICY STRATEGY FOR CARBON CAPTURE AND STORAGE, *supra* note 128, at 10.

important in order to provide learning opportunities, offering the potential for greater societal benefits than by leaving the dissemination of information to private firms, and by promoting coordination between firms.[135]

D. Incentives for Researching, Developing and Investing in Coal Policy

Carbon capture, as well as a variety of other clean coal technologies, exist and must be incentivized not only to be useful but to be further developed. Tax incentives have been a useful tool to promote the use of clean coal.[136] Under the Energy Act of 1978, Congress provided tax credits for investments in energy conservation products in homes and businesses, and studies show that between 1978 and 1985, approximately thirty million taxpayers took advantage of these credits.[137] In addition, "[w]hen market entry barriers cause consumers to make environmentally unsound decisions, tax incentives can help overcome market barriers," such as high costs and low availability.[138] Tax incentives generally expire after a relatively short time, but for a new energy policy, tax incentives for clean coal must be long-lasting to alleviate potential consumer uncertainty.[139]

In addition to tax incentives, marketing is imperative to the promotion and development of clean coal. The focus of marketing is to create a desire for products, and should also be a focus of a comprehensive energy policy.[140] While tax incentives can help overcome market barriers, marketing will also help create a demand for coal, which would stimulate the U.S. coal industry tremendously.[141]With the creation of a deregulated market policy, the demand for coal will not rise, and, in turn, an export plan will not come to fruition.

Tax incentives are a burden shared by the entire taxpaying public.[142] Due to this economic reality, the tax incentives proposed

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[135] *Id.*

[136] Roberta F. Mann and Mona L. Hymel, *Getting Into the Act: Enticing the Consumer to Become "Green" Through Tax Incentives*, 36 ENVTL. L. REP. 10419, 10422 (2006).

[137] *Id.*

[138] *Id.* at 10421.

[139] *Id.* at 10429.

[140] *Id.* at 10421.

[141] *Id.*

[142] Mann & Hymel, *supra* note 136, at 10422.

in this Note for clean coal and coal export are important and impactful enough to warrant public payment. Energy programs that use tax incentives for clean coal technologies and coal export will produce a return for the economy, and the public will happily bear the cost of those tax incentives. Due to the high demand for coal in China and India, an export plan could stimulate the economy in a way that makes up for any cost to the public.

Traditionally, the vast "majority of energy tax subsidies belong[ed] to businesses that extract, produce, and transport nonrenewable resources."[143] It is paramount to keep subsidies and incentives in place for businesses that do the same with coal. A successful policy should also incentivize individuals and every contributor to the economic landscape. Doing so would help ensure maximum return from the combination of clean coal technologies and the export of domestic coal. If tax credits exist for those who invest in clean coal, carbon capture and storage, and the export of coal to Asia, a large portion of U.S. taxpayers will take advantage of these credits, and the policy can more readily succeed.

Studies suggest that tax credits play a "significant role in increased energy conservation activity," and that "substantial cost-effective energy savings can be achieved through energy conservation products."[144] Clean coal technologies contribute to energy conservation, and tax credits should be statistically significant in increased conservation activity. Additionally, if individuals can recognize that a policy that incentivizes clean coal is energy-conserving, then the effectiveness of the policy could increase exponentially.

Research regarding the coal needs in developing countries should also be included in any tax incentives because developing countries need fuel in order to grow their economies. The extensive coal reserves in the U.S. could allow tax incentives for energy exported to developed and developing nations alike. If the U.S. hopes to remain a leading energy exporter, it must consider the needs of every country.

Annual energy use is growing at around five percent per year in countries that do not belong to the Organisation for Economic Co-operation and Development (OECD), despite a per capita energy usage of approximately thirty percent of OECD

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[143] *Id.*
[144] *Id.* at 10422–23.

member countries.[145] For example, the U.S uses thirty times more energy than that used in Bangladesh.[146] Many countries, especially developing nations, find extracting natural resources and effectively managing revenue from these resources a challenge.[147] In addition, Nigerian leaders have stated that they are in favor of developing coal power projects in Africa.[148] These sentiments serve as examples of the great need for coal in small developing countries and more developed nations alike.

Some countries cannot afford to disregard any particular energy source because of climate concerns, and instead, need a fast track to more coal.[149] Incentives to export U.S. coal to developing countries are necessary because of these countries' dire need for energy sources. Incentives in the U.S. for the export of clean coal circumvent any concern that burning non-clean coal in developing countries will lead to high emissions.

IV. CONCLUSION

Energy needs are rising across the globe, and the future promises even more energy consumption than ever before.[150] The most significant defect of U.S. energy policy since the 1973 Oil Embargo has been its inability to endure and expand with time.[151] A new policy must utilize coal and fossil fuel reserves located within the United States. A comprehensive policy such as this should exploit the abundant and continuous coal and fossil fuel usage predicted for the future. U.S. energy policy should gradually shift its focus from domestic coal distribution to global coal exports, and therefore successfully expand over time while simultaneously incentivizing the exportation of coal and development of clean coal technologies.

With the Energy Information Administration's predictions of future energy consumption worldwide, the U.S. must set forth

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[145] *Energy in Developing Countries*, OXFORD ENERGY, https://www.energy.ox.ac.uk/wordpress/energy-in-developing-countries/ [https://perma.cc/VEB3-BUPB].

[146] *Id.*

[147] *Id.*

[148] Benjamin Sporton, *Developing Economies Need Power from Coal*, FINANCIAL TIMES (Aug. 20, 2015), https://www.ft.com/content/1835443f-0757-36f3-ba64-305ceff60ac4 [https://perma.cc/X34S-FYCE].

[149] *Id.*

[150] *See* U.S. ENERGY INFO. ADMIN., *supra* note 7, at 19–20, 63–64.

[151] Kaplan, *supra* note 26, at 732.

on a new path to a flexible and long-lasting energy policy to carry into the future. The U.S., along with the rest of the world, has greatly advanced since the coal boom that drove the Industrial Revolution.[152] Despite the changes in energy consumption since then, coal persists as one of the most prominent fuels and will continue to play a vital role in the energy needs of the future.[153]

To take advantage of a steady international coal market, and the predicted increase in coal usage in Asia, the U.S. should heavily incentivize the use of clean coal technologies and the productive use of coal byproducts.[154] Furthermore, a new policy should incentivize the research and development of more efficient means of coal usage. Only through comprehensive incentive programs can the U.S. remain a dominant player in the future of coal usage around the world.

The use of incentives for clean coal and clean fossil fuels can supplement other growing energy areas and have positive impacts on the U.S. economy, government, and laws, as well as individual citizens and businesses. Moreover, the export of coal produced through clean methods will allow the U.S. to remain a prominent energy exporter and will help grow both domestic and international energy sectors. Finally, by using the vast and untapped natural reserves of fossil fuels found domestically, the U.S. can continue to be a key exporter of coal energy for the years to come.[155] With proper use of clean coal technologies, carbon capture, and energy exports, the U.S. can look to the future of energy with alternate, and ultimately better, energy policies to address the growth in worldwide fuel consumption.

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[152] NAT'L PUB. RADIO, INC., *supra* note 4.
[153] *Id.*
[154] U.S. ENERGY INFO. ADMIN., *supra* note 7, at 64.
[155] Taylor, *supra* note 47, at 217–18.