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The Future is Ours to See

In the United States and Beyond

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The Future is Ours to See by Schaun D. Henry, Esq.

The term "going green" is everywhere these days. A large portion of going green will involve developing and maintaining a renewable energy model. Such models can significantly slow the growth of global warming. The World Health Organization (WHO) has theorized that failure to properly negate climate change and its effects would lead to as many as 250,000 deaths per year from malnutrition, malaria, diarrhea, and heat stress between 2030 and 2050. [i] No doubt this would be a terrible outcome and most people would agree that we should take action. Experts disagree however on what the goals of such actions should be. They further disagree on whether we could ever reach a goal of 100% clean energy. There is as well, the issue of whether the political will exists to meet 100% clean energy goal. Reaching that goal is also highly dependent on technological innovation. Many of the technologies we would need to rely on are in their fledgling stages and success in meeting a 100% clean energy goal may well turn on breakthroughs in technology that are little more than aspirational at this point.

Another factor related to technological advancement is redeeming the cost for businesses and individuals to retrofit their buildings and homes to run on clean energy. While tax incentives do exist for those that seek to install clean energy heating, cooling and power systems, they do not cover the total cost. Changing the methods by which electricity is generated from fossil fuels to renewable energy sources is likely the easiest transition to make. consider however that transitioning from natural gas or fuel oil heating to electric heat will require retrofitting many millions of homes and businesses at a cost would largely be borne by the consumer. Electric heat it's still considerably more expensive than a new gas heating system. It is unlikely that consumers will simply chase to make the switch to renewables on their own. Such changes would likely require a mandate. Although could a government mandate require people to spend money they do not have to switch to renewables?

Electric vehicles are already widely available, but here two price point is a factor. Currently if the average person's car were to breakdown, it would be relatively easy for a person to simply buy an inexpensive used vehicle. If we were to require that all vehicles be electric vehicles, the public transportation system would need to be a lot more efficient because many consumers would simply be unable to afford replacing their old combustion engine vehicles with an electric vehicle (EVs). California has an executive order in place requiring all new vehicles sold beginning in 2035 to be zero emissions vehicles. (EON-29-20. This executive order has been widely reported among news sources. What has not been reported quite as widely is that combustion engine vehicles and hybrids made in 2034 and earlier could still be sold under the executive order, meaning that combustion engine vehicles would be around for a long time to come, even in California. Stepping away from these problems for a moment hundreds of millions of people worldwide burned wood for cooking and heating. While it is true that emissions from these activities pale in comparison to commercial and industrial endeavors, these are only a few of the realities we face when considering Down a 100% renewable energy future.

1. Energy Transition, Where Are We Now

According to RMI, an independent non-partisan and non-profit organization working to accelerate the clean energy transition, most scientists agree that we must limit global warming

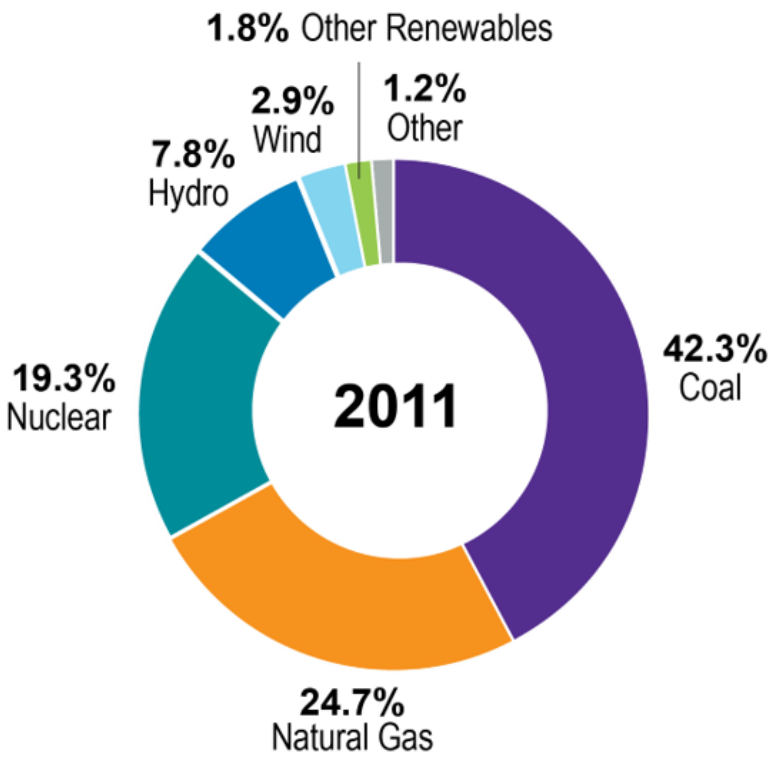
to 1.5 degrees Celsius to avoid the worst impacts of climate change." ii This is a view shared by the WHO and signatories of the Paris Climate Accords. In order to meet this goal, many say we must reduce global emissions by 50% from 2010 levels by 2030. Going further, we must meet 0 emissions by 2050. The fact of the matter is that we have already reduced emissions by approximately 35% from 2010 levels by 2020. iii Given that fact, reaching the 50% level by 2030 seems more than possible at the current rate. Getting to that 0 emission by 2050 is going to take some considerable adjustment, not to mention political will.

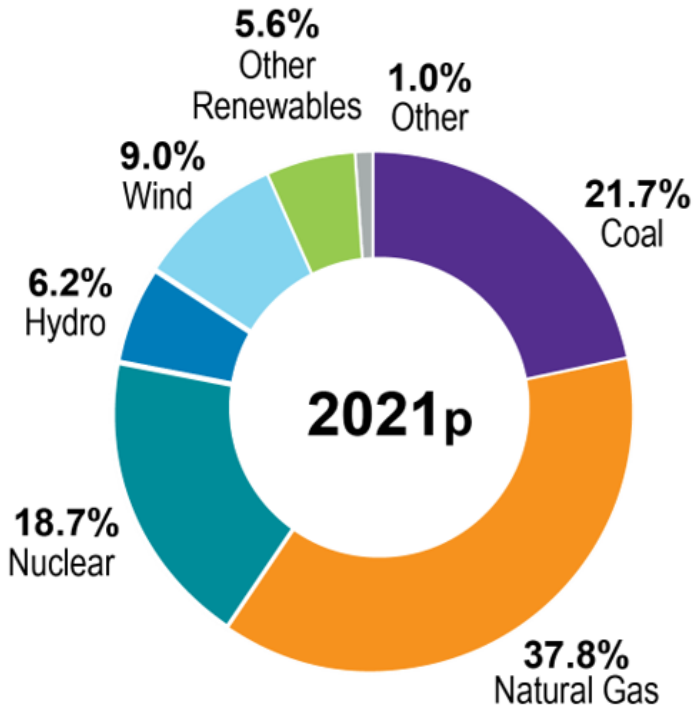
In order to reach the goal of limiting global warming to no more than 1.5 degrees Celsius rise, some scientists propose a 100% renewable energy goal is not only attainable but necessary. While others argue that a mix that includes carbon capture, direct air capture, blue hydrogen and or nuclear energy is more feasible and can produce a more reliable system of energy transmission than renewable energy alone. Mark Jacobson (Jacobson) is a Stanford professor who believes strongly that the US can meet its energy demands by 2050 using 100% wind, water, and solar. In a December 2021 interview with CNBC's Catherine Clifford, Jacobson laid out his viewpoint in layman's terms. [iv]

Jacobson was interviewed after a recent update of his 2015 study on the matter. The 2015 version of this study had been highly criticized, however Jacobson revised this study with more granular data. Jacobson defined three goals for his studies: eliminating air pollution and global warming; and providing energy security. [v] The study theorized that as much as 80% to 85% of our energy demand can be supplied from wind, water and solar by 2030. The other 15 to 20% could be supplied through the same clean sources. To meet this goal, every use of energy would need to be use of electric energy. Jacobson posits that our energy demands in 2020 were about 1.2 terawatts (TW) (the equivalent of one trillion watts for one hour). By 2050 that demand is expected to reach 2.6 TW. To meet that demand, energy capacity would need to be at about 6.5TW. [vi] As of 2020, 61 countries had 100% renewable energy laws. In addition, 13 states in the US had laws where executive orders express renewable energy goals. Finally, 180 US cities and 300 cities worldwide had laws supporting 100% energy goals.[vii]

Solar and Wind based energy are variable. That is to say sometimes the wind does not blow and the sun does not shine. The problem is not energy production from sun and wind. That production is prolific. A lack of interconnectivity of the electric grid in the US however means that some areas, like those in the central area of the country: Montana, Wyoming, Colorado, New Mexico, North Dakota, South Dakota, Nebraska, Kansas, Oklahoma, Texas, Minnesota, Iowa, Missouri, Arkansas, and Louisiana produce more wind energy than they need. Other areas of the country, however, may remain in dire need of that energy. Electricity can be stored in batteries for only short periods of time under current technologies. That time frame is measured in hours, not days or weeks. If excess electricity cannot be stored, it will need to be transmitted. Scientists estimate transition the entire US power grid to an integrated 100% renewable energy grid would cost about 4.5 trillion dollars. In addition, the transition would require us to double the current transmission line coverage from 200,000 to 400,000 miles.[viii] While technologically and logistically possible, such changes will require crossing private and Native American lands. This will no doubt result in land use litigation throughout the areas where the transition lines will run.

The fear of blackouts during times of peak usage also looms large. We have seen notable blackouts used in the current grid in places like Texas and California. Nuclear power and fast reacting fossil fuel backups like natural gas may be needed to avoid service interruption. Wind and solar production may not be at their peak when the demand is highest, making these backups critical. Given these considerations, fossil fuels are unlikely to disappear even as clean energy grows. The chart below shows how the mix of energy use has changed from 2011 to 2022. Note that the use of coal has been reduced by half while the use of wind power has increased threefold.





Note: "Other Renewables" includes universal (or large-scale) solar, geothermal, and generation from biomass sources (agricultural waste, landfill gas recovery, municipal solid waste, wood, non-wood waste). Source: U.S. Department of Energy, Energy Information Administration

2. Federal Legislation

On November 15, 2021, the President signed the Infrastructure Investment and Jobs act (IIJA). [ix] The law addresses a range of issues including surface transportation, transit, water infrastructure, energy and mineral issues. The law appropriates 75.8 billion dollars for energy and minerals related research, demonstration, technology deployment and initiatives. The law also provides for 6.42 billion dollars for a carbon reduction program managed by the DOT including greenhouse gas rations. 11.3 billion dollars has been assigned for the abandoned mine reclamation fund. Programs covered by the law include:

- Energy efficiency and renewable energy – 6.1 billion
- Electric grid resiliency and reliability as well as cyber security – 14.9 billion
- Carbon capture, utilization and storage – 12.2 Billion
- Hydrogen programs – 9.5 billion
- Nuclear energy – 8.5 billion
- Battery manufacturing and recycling critical minerals – 7.9 billion
- Fossil fuels energy program – 4.7 billion

The new bill offers some exciting opportunities for the advancement of the clean energy programs. Some of these opportunities are not always obvious.

a. Abandoned mine reclamation

As the nation uses less and less fossil fuels, it will become critical to clean up and reclaim coal mines no longer in use. 5.5 million people live within a mile of an abandoned coal mine in Appalachia alone.[x] The legacy of fossil fuel infrastructure imposes an economic, environmental and public health toll on surrounding communities. Environmental reclamation of these abandoned fossil fuel sites is expected to address local pollution and make the land more useable. This reclamation can also create jobs, clean up local sources of pollution and reduce greenhouse gas emissions.

Abandoned coal mines can contaminate water and soil which surrounds them. This limits business opportunities in the local area by making the water and land unusable. There are an estimated 56,000 abandoned coal mines in the United States. 36,000 are in rural counties. A large concentration of these mines exist across Appalachia where communities have experienced persistent poverty for decades. These clean up opportunities are likely to produce as many as 116,000 jobs over a period of 5 years. Over two thirds of these jobs will be created in four states: Pennsylvania, Kentucky, Kansas, and West Virginia. It is true however that these jobs would likely be temporary and would not be a full replacement for the now non-operational coal mines where residents previously worked.[xi]

b. Surface Transportation

The designation of funds under this section allows for the designation alternate fuel (AF) corridors for use by the public. We will require a significant increase in electric vehicle usage as we transition away from fossil fuels. The law allows for the development of infrastructure along these alternate fuel corridors to include electric vehicle charging. The law also provides for

refueling of medium and heavy duty vehicles using hydrogen, propane, and natural gas among the yet to be designated AF corridors. Projects in rural areas, low and moderate income communities and communities with lower rates of private parking spaces or higher rates of multiunit dwellings are given priority.

State and local governments along with transportation authorities will be considered eligible entities for these grants. These entities will be authorized to establish partnerships with private organizations, both for profit and non-profit, for the acquisition and installation of alternate fuel infrastructure.[xii] The massive business opportunity created by this alternate fuel infrastructure plan is difficult to comprehend. Imagine thousands of miles of AF corridors all infused with new fueling systems and support technologies for AF vehicles.

c. Hydrogen Investments

As Allison Rumsey observed in her December 27, 2021 blog, hydrogen is the simplest element on earth. In spite of this, it is a versatile energy carrier. It can be produced from almost all energy sources including renewable power, nuclear power and natural gas. Hydrogen can be used as a fuel option for a variety of applications including transportation and electric generation.[xiii] The IIJA authorizes the Secretary of Energy to partner with the private sector to reduce the cost of hydrogen technology in creating clean hydrogen. The law also contemplates the transmission and distribution of clean hydrogen through pipelines adapted from natural gas use. It further contemplates the development of fuel cells, fuel cell subsystems and research and development into the reliability and durability of fuel cells.[xiv] The clean hydrogen research and development program will address goals such as:

- Clean hydrogen production from a variety of energy sources, including fossil fuels with carbon capture, utilization storage, renewable energy and nuclear energy
- Clean hydrogen use for commercial, industrial and residential electric power generation; industrial applications; as a fuel source for residential and commercial comfort heating and hot water; and in the transportation sector.
- Clean hydrogen delivery and storage
- Hydrogen fuel cell development
- Domestic clean hydrogen equipment manufacturing
- Uniform codes and standards development focused on clean hydrogen production

As mentioned earlier, the current issue with the production of clean electricity is not one of production itself. In fact, the real problem is the inability to store that electricity for extended periods of time or transport it to areas where it is needed. If we cannot do either of those things, that energy is wasted. The goal here is that the advancement of clean hydrogen systems and technologies will exponentially increase our ability to store electricity through hydrogen batteries among other uses for hydrogen. It is worth noting here through that the establishment of standards and uniform codes will be critical when it comes to determining what clean hydrogen and in fact clean energy truly is. With the sheer volume of government dollars available for investment in clean energy there is little doubt that there will be those who will attempt to exploit the system by claiming to be “green” operators without actually meeting the

standards adhered to by other companies. More on that later.

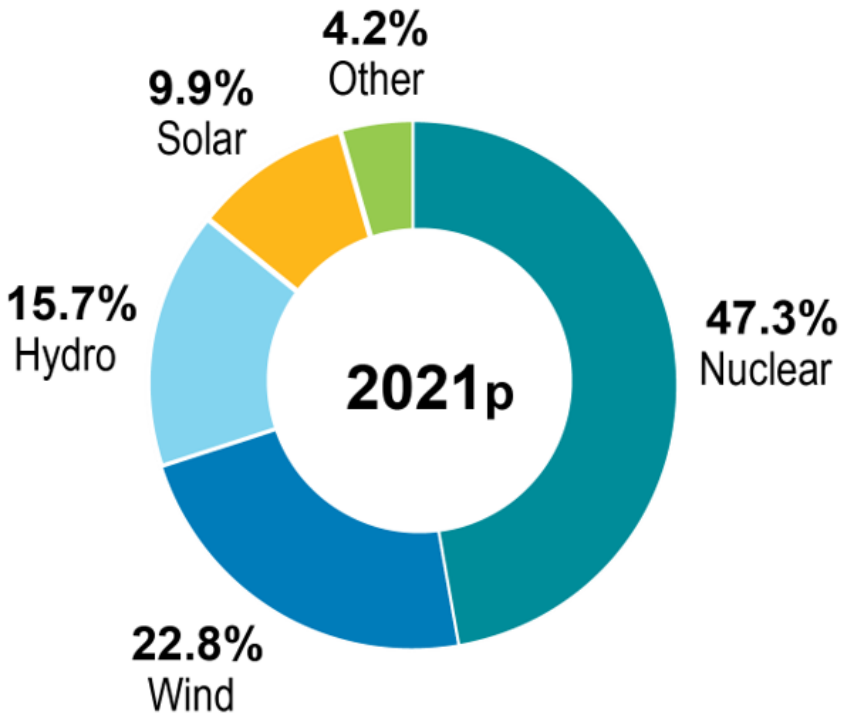
d. Carbon Capture Storage, Utilization, and Transportation Infrastructure.

Broadly speaking, carbon capture storage is any method that collects CO2 and puts it somewhere it won't contribute to climate change. In theory, with enough carbon capture systems it might be possible to reach a world with negative CO2 emissions even if we continue burning fossil fuels. The belief is that an aggressive carbon capture storage campaign could avert most of the damage from climate change without having to convert most of our fossil fuel plants and vehicles to run on cleaner sources of energy. The IIJA sets aside funds that establish new programs and policies aimed at promoting increased opportunity for carbon capture, utilization, and storage and direct air capture in the United States. Direct air capture is still a budding technology and involves taking CO2 directly out of the air. This is a very difficult task because CO2 is found in much smaller concentrations in the air than it is found, for example, in the exhaust from a coal mine, where carbon capture technology has been utilized the most. Both carbon capture utilization and storage and direct air capture may be considered options to address climate change. The truth is however that both of these technologies are in the very early stages of development and there are very few operating projects worldwide. Carbon capture utilization and storage involves four steps: (1) Capturing carbon dioxide (CO2) from industrial source like a coal mine and separating it from other gases; (2) compressing and transporting the CO2; (3) utilizing CO2 as an input to other industrial processes, though this step is not always present; and (4) storing CO2 in either useful products or geological reservoirs, often underground. Direct air capture involves similar steps but with CO2 captured directly from the ambient air.

The IIJA establishes support for large scale deployment of carbon capture utilization and storage and carbon removal including direct air capture. The law also contemplates the need for the development of a carbon dioxide transportation storage infrastructure that can be used to move captured CO2. A key element to the increased development of carbon capture systems is the establishment of a sufficient CO2 pipeline network, at the lowest cost, taking into consideration the source where CO2 will be captured and the location where it will be stored. There are currently regional CO2 pipeline networks that currently exist in the US and are used for enhanced oil recovery. For example, CO2 can be captured from a coal mine and pumped into a nearby oil field thereby enhancing the speed and volume of oil that can be recovered. Transferring that technology to a much more expensive national network of a carbon capture utilization storage will involve considerable increases in cost for transporting captured CO2. The new law establishes a carbon dioxide transportation infrastructure finance and innovation program to be administered by the Secretary of Energy to provide low interest loans for CO2 pipeline projects and grants for initial excess capacity. Grants and loans will be prioritized to support large capacity pipeline projects that have a demonstrated demand for use of the pipeline capacity by CO2 producers. Preferred projects will be in geographic areas already associated with carbon capture projects to minimize siting impacts. Loans and grants will be kept at 80% of the eligible project cost.

Once captured and transported the CO2 will need to be stored in large quantities. Much of this

storage takes place underground. The IIJA allows for grants for the research and implementation of safe storage projects. Long term storage is also contemplated in the ocean on the outer continental shelf. Under the new law, the Department of Energy has been tasked with developing four regional direct air capture hubs. A direct air capture hub is described as a network of direct air capture projects which may share a transportation infrastructure and subsurface storage resources. Make no mistake, carbon capture utilization storage and direct air capture are extremely expensive projects and would be unlikely to be developed on a large scale without government assistance.[xv]



Nuclear energy remains the largest source of carbon-free electricity.

Currently, 93 reactors in 28 states produce nearly 20 percent of our nation's electricity and approximately 50 percent of our carbon-free electricity.

p = preliminary
"Other" includes biomass, geothermal, and landfill gas.
Source: U.S. Department of Energy, Energy Information Administration.

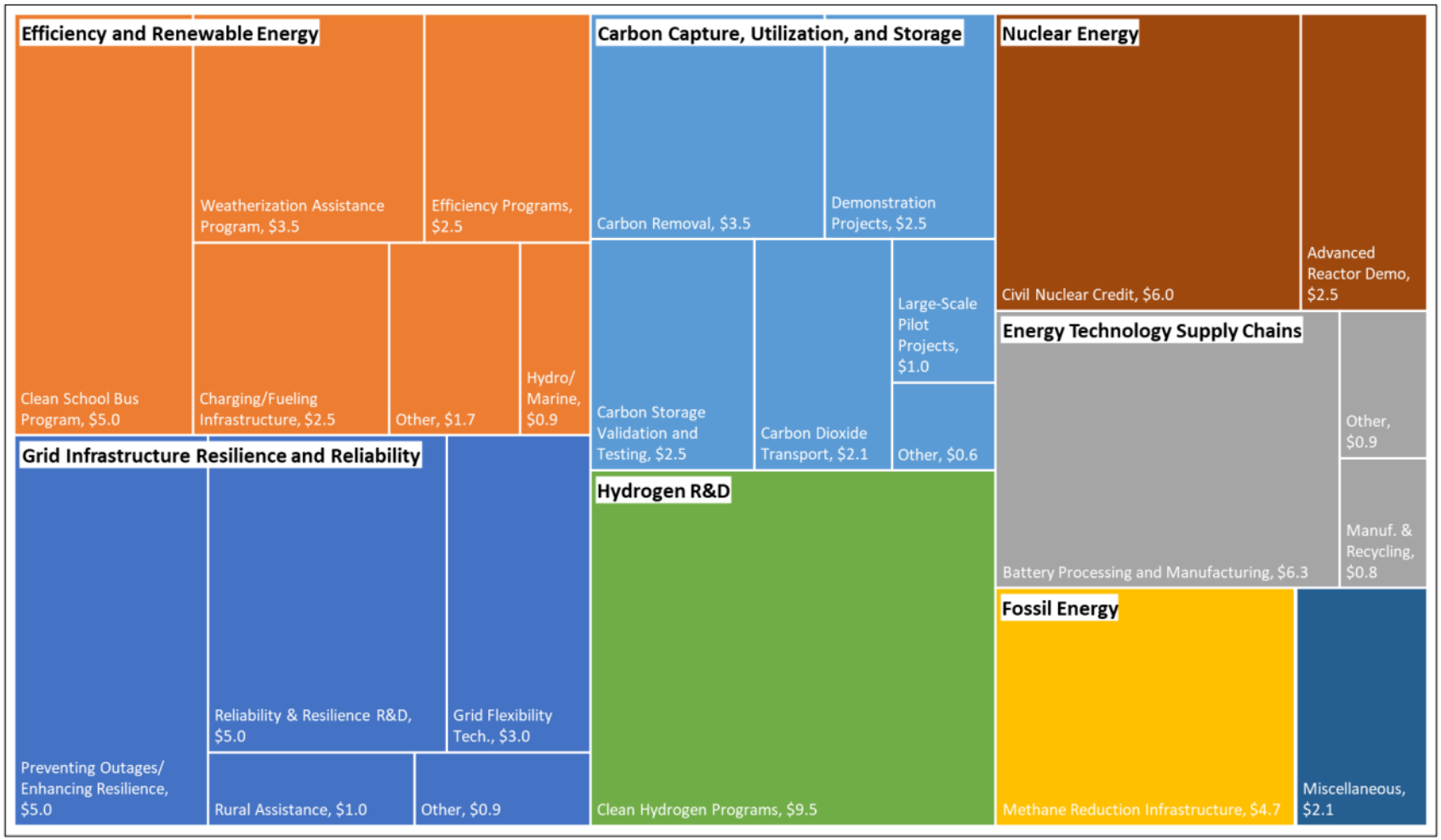
Nuclear energy currently provides the larges source of carbon free electricity in the United States.

The IIJA includes provisions on advanced reactor research and deployment and the financial viability of existing nuclear power plants. Under the law, the Department of Energy is required to report to Congress on the value of small, advanced reactors and provide assistance for citing studies about their potential development in isolated communities. The Department of Energy's advanced reactor research and development provisions require the assignment of property interests. This includes confidentiality provisions regarding nuclear reactor development as well as confidentiality regarding financial information. The law also provides for tax credits that could be available to owners of existing nuclear power plants to avoid permanent shutdowns.

The government's interest under the IIJA are focused on small modular reactors. A small modular reactor is defined as an advanced reactor with less than 300 megawatts (MW) of energy generating capacity and "that can be constructed and operated in combination with similar reactors at a single site"[xvi]. A micron reactor however is defined as an advanced reactor with electrical generating capacity no more than 50MW. In contrast, most existing commercial reactors have an option capacity of 1000MW or more. Under these government assisted research programs, the dis of trade secrets of privileged confidential commercial financial information could be prohibited for up to 30 years. As we touched on earlier, existing nuclear reactors that sell their electricity in competitive wholesale markets are eligible for credits if the Secretary of Energy certifies that the reactors are likely to close because of economic factors and that the closure would result in increased pollution. In order to be eligible for credits the nuclear regulatory trade commission has to provide reasonable assurances that the reactor can continue to operate safely once credits are provided. In order to qualify for credits, reactors at risk of closure must submit costs and revenue data and an estimated potential increase air pollution that will result from its shut down. Once certified by the Secretary of Energy, reactors can receive credits for up to 4 years.

The IIJA is certainly a showing of political will to support the green energy push. Is political will alone be enough, however? As we have already mentioned, carbon capture technologies are far from being ready for large scale deployment. In addition, the ability to store electricity for extended periods of time is simply not with us at this point. Nuclear energy remains a number one player however even there we will need significant new developments in order to meet energy transmission goals by 2050. This is not even taking into consideration that many believe that nuclear power should not be a part of green energy projects going forward. It remains to be seen what impact the Biden administration's wide ranging infrastructure investment plan will have on a green future. If nothing else, one can certainly say that we have put our money where our mouth is as it applies to clean energy. A breakdown of the energy related appropriations in the in infrastructure law can be seen in the next chart.

FY2022-FY2026 Energy-Related Appropriations in P.L. 117-58 by Category ($ billions)



Source: CRS analysis of P.L. 117-58.

Notes: Excludes $11.293 billion for the AML Reclamation Fund and $6.42 billion for the DOT Carbon Reduction Program, which may fund non-energy projects. R&D denotes research and development. Manuf. denotes manufacturing.

3. Challenges to a Green Energy Future

a. Environmental Groups

One would imagine that environmental groups would be heavily in favor of the clean energy movement. This however is not necessarily the case. Clear Path is a clean energy advocacy group. Its publication, Hawkeye State Headwinds[xvii] noted several challenges presented by environmental groups in Iowa, one of the nation's larges wind producers. The report pointed out that the scale and pace of wind deployment must increase between three and seventeen times its 2020 capacity if we are to reach net zero by 2050. The publication pointed to the prevalence and stringency of wind ordinances that are increasing across the US. It pointed out that numerous states, particularly in the mid-west, have county level sitting authority, many counties have adopted prohibitive ordinances for wind development. The publication pointed out that currently in Iowa there are 16 of the 99 counties that have stringent restrictions on wind. Six have indefinite wind energy moratoriums, three have temporary moratoriums, and seven have ordinances prohibitive to development. Prohibitions against wind development do not end simply at the idea of curtailing the development of windmills. The expansion of the transmission grid is also under attack in many states. Clear Path pointed out that additional proposals for new transmission lines have been declining and more than 65% of high voltage line mileage has faced historical opposition.

In Iowa alone, more than 49% of wind projects are being ruled out by local ordinances. In 2021, Iowa generated more than 55% of its electricity from wind sources, the largest share of any state, according to the Energy Information Administration. According to Clear Path, reaching net zero carbon emissions by 2050 would require a massive infrastructure build out over the next 28 years. But because of opposition, not all net zero pathways for transmission that have been modeled are actually feasible. Because of the level of opposition involved with high voltage transmission lines Clear Path suggests that the reuse or optimization of existing infrastructure and rights of way may be essential to reaching the net zero goal.

b. Permitting Concerns

The rapid expansion of the renewable electricity system would require the quick planning, permitting and building of renewable energy sources like solar plants and wind farms. As we have already stated it will also require long distance electrical transmission lines to transport the clean energy from sparsely populated areas where it is abundant to the urban centers were it is sorely needed. We have discussed the difficulties of local permitting issues, but the Federal permitting process is also a part of the problem. Speeding the process of federal permitting and setting time limits on environmental reviews are critical. Most wind energy projects in the pipeline are stuck in the permitting phase, just about 21% of planned projects are currently under construction. Major transmission projects have run into difficulties or have been scrapped entirely in recent years. The studies authorized by the new infrastructure law may go a long way towards addressing this permit reform.

Currently, the permitting process for renewable energy projects is multilayered and the exact type and number of permits for a particular project depends on the project's size, technology

and jurisdiction, most projects do require approval from local, state, interstate and federal authorities. In a recent Bookings article, the difficulties surrounding permitting were laid out for all to see.[xviii]

Source: www.brookings,edu/research/how-does-permiting-for-clean-energy-infrastructure-work

Permit	Description
Wildlife Protection	**Projects that may affect endangered species, fisheries, any natural body of water, marine mammals, migratory birds, or bald or golden eagles, require a consultation and/or permit.**
Endangered Species Act Consultation	Consultation with the National Marine Fisheries Service (NMFS) or the U.S. Fish and Wildlife Service (FWS) if any endangered species are affected[1]
Magnuson-Stevens Fishery Conservation and Management Act, Section 305 Essential Fish Habitat (EFH) Consultation	Consultation with NMFS if any Essential Fish Habitat (EFH) is affected
Fish and Wildlife Coordination Act Review	Consultation with FWS or NMFS if any body of water is affected (typically as part of EFH consultation, above)
Marine Mammal Protection Act, Incidental Take Authorization	Permit from the NMFS if there may be incidental harassment or injury to any marine mammal
Migratory Bird Treaty Act permits	Permit from FWS if any migratory birds are affected
Bald and Golden Eagle Protection Permit	Permit from FWS if any bald or golden eagles are affected
Air and Water Protection	**Projects that may pollute the air or water require special permits**
Section 404 of the Clean Water Act, Section 10 of the Rivers & Harbors Act	Permit from the U.S. Army Corps of Engineers (ACE) for any project affecting waterways, wetlands, or harbors
Clean Air Act, Outer Continental Shelf (OCS) Air Permit	Permit from the Environmental Protection Agency (EPA) for projects that may cause offshore air pollution
Federal/Protected Land Usage	**If a project proposes the use of any federally owned or protected land, a permit is required from the relevant land administering agency.**
Business Resource Lease	Approval from the Bureau of Indian Affairs (BIA) to lease Native American land for development
Service Line Agreement	Approval from the BIA to pass through or access Native American land
Wind Energy Evaluation Lease - Indian Lands	Approval from the BIA to lease Native American land for wind energy
National Park Service (NPS) Permit	Permit for the use of NPS land
Right-of-way Authorization	Authorization required for any right-of-way passing through land owned by the Interior Department, whether the Bureau of Land Management (BLM), BIA, or FWS wildlife refuges
Special Use Permit (FS)	Permit for the use of U.S. Forest Service land
Outgrant Administrative Action	Permit for the use of Department of Defense land
Easement Administrative Action (USDA – NRCS)	Permit from the U.S. Department of Agriculture for projects on agricultural lands or wetlands with conservation easements
Floodplain Assessment	Permit and assessment from the Federal Emergency Management Agency (FEMA) or a local government, for construction on flood risk areas
National Marine Sanctuaries Act permit	Consultation or permit (of multiple different types) for projects in a national marine sanctuary
Construction and Operations Plan, Outer Continental Shelf Lands Act	Permit for offshore wind construction on the OCS from the Bureau of Ocean Energy Management

At the local level, most renewable projects will require land use permits based on the zoning and planning ordinances of the city or county government in which they will be located. Local ordinances can often create significant barriers against wind energy. By way of example, those barriers can be based on the appearance, noise and other localized impacts of the project as pointed out in the Brookings article, generation and transmission projects often require consent of communities in and around the area of operations. As discussed earlier, construction of transmission lines in particular, often run through private property ultimately resulting in eminent domain battles in an effort to site projects.

At the state level, project permits may have to be issued through state level agencies. Indian tribal governments may also be implicated. In addition, renewable energy projects also need to connect to local electrical grids which are called "original transmission networks" in order to deliver power to customers. Power generating projects require approval of the transmission network to connect to the grid. Finally, at the federal level large projects require a wide range of federal permitting from multiple agencies.

Federal permits for environmental protection are also required for air and water projects. Under the Clean Air Act and Clean Water Act, the federal environmental protection agency (EPA) is tasked with regulating air and water pollutants respectively. Any project that could result in pollution must go through this process. Wind projects, especially those that are off shore often require clean air act permits. In addition, wind, solar and transmission projects are all likely to need Clean Air Act and Clean Water Act permits during their construction phases as they produce regular construction pollution. Needless to say, permits for environmental protection are an important factor in siting of clean air projects.

Projects that will pass through or be sited on federal protected land will also require the project be permitted by various federal agencies that may control that particular land. Such agencies can include the Bureau of Land Management, the forestry service, the US Fish and Wildlife service and several others. Projects that seek to use these lands will be required to lease these lands with the approval of the managing agency. To give an idea of the timeline to receive all necessary federal permits to conduct a project, the Brookings article used the example of the South Fork Wind project. This was an offshore wind project off the coast of Rhode Island which was first proposed in 2015. The project began its permitting in 2018. Final permits were finally granted in January of 2022. This example make it clear that the federal permitting system is in need of dire repair in order to reach net zero goals by 2050.

c. Legal challenges

In any endeavor as wide ranging as the green movement, one would expect that there would be lawsuits and here, lawsuits abound. One of the most telling was the case of West Virginia v. The Environmental Protection Agency. In this case, the Court examined whether or not the Obama administration's marquis climate policy, the Clean Power Plan of October 2015, which was later repealed and replaced by the Trump administration's 2019 Affordable Clean Energy rule, were in fact lawful. The Affordable clean energy rule and the Clean Power Plant policy both sought to target CO2 emissions. The Trump era affordable clean energy rule sought to limit CO2 emissions

by requiring coal fired Power Plants to operate more cleanly. The Clean Power Plan however, sought to limit emissions by limiting the percentage of the electric power generation system that could be occupied by coal fired powerplants. The Court made its decision in June of 2022[xix]. In making its determination, the Court acknowledged that it had stayed the Clean Power Plan in 2016, preventing the rule from taking effect. It further acknowledged that the rule was later repealed by President Trump as stated above. In repealing the Clean Power Plan, the Trump administration's EPA found that the plan had exceeded the agency's statutory authority. EPA determined that the Clean Power Plan sought to literally shift the energy generation mix at the power grid level. Instead, the agency determined that any determination that it made should set standards "based on the application of equipment and practices at the level of an individual facility,". In otherwise the facility should be able to remedy any concerns using technology readily available to it.

A number of states and parties filed petitions for review in the DC circuit, challenging EPA's repeal of the Clean Power Plan and its enactment of the replacement rule by the Trump administration. The Court of appeals consolidated the cases and held that EPA's "repeal of the Clean Power Plan rested critically on mistaken reading of the Clean Air Act-mainly, that electric generation shifting cannot be a system of emissions reduction under the law. The DC circuit vacated the agency's repeal of the Clean Power Plan and remanded to the agency for further consideration. It also vacated and remanded the Trump era rule for the same reason[xx]. The Supreme Court took up the appeal in the matter.

Prior to 2015 the Environmental Protection Agency had always set the emissions limits based on the application of measures that will reduce pollution by causing the regulated source to operate more cleanly. The Agency had never established policy by looking to a "system" that would reduce pollution simply by shifting polluting activity from "dirtier to cleaner sources."[xxi] The Supreme Court also noted that EPA had always set emissions limits- the "cap" – based on the use of "technologies" that could be "installed and operated on a nationwide basis". Under the Clean Power Plan however, there were no controls that a coal plant operator could install and operate to obtain the emissions limits established by the plan.

The Court admitted that the Agency had even acknowledged the novelty of its approach where it explained that it was pursuing a "broader, forward thinking approach to the design" of its regulations that would "improve the overall power system," rather than the emissions performance of individual sources, by forcing a shift throughout the grid from one type of energy source to another.[xxii] The Supreme Court noted that this sort of view of the EPA's authority was not only unprecedented; it effected the "fundamental revision of the statute, changing it from one sort of screening in regulation into an entirely different kind."[xxiii] Prior to the Clean Power Plan, the Agency established emissions limits by determining the "best system of emissions reduction" or (BSER)[xxiv]. With the Clean Power Plan, the EPA decided that the BSER was one that would reduce carbon pollution, mostly by moving production to cleaner sources. The "EPA then set about determining the degree to which emissions limitations would be achievable through the application of that system."[xxv] The Agency ultimately decided that it would be feasible to have coal provide 27% of the national electricity generation by 2030, down from 38% in 2014.

The Supreme Court determined that it would use the "major rules" doctrine in deciding this case. The major rules doctrine holds that Courts should expect Congress to "speak clearly" if it wishes to assign to an agency "decisions of vast economic and political significance". Consequently, Courts should be skeptical – not deferential – when an agency "claims to discover a long extant statute and unhailed power to regulate a significant portion of the American economy."[xxvi] In short, the Court determined that the Agency must point to a "clear congressional authorization" for the authority it claims[xxvii]. The Court ultimately determined that the BSER identified by the Agency in the Clean Power Plan was not within the Agency's authority.

Given the Court's determination in this case, as well as the case's recency, we should expect more judicial intervention into political efforts to assist in clean energy generation.

d. Fraud and Abuse

Given the trend toward going green, many companies are seeking to cash in on the popularity of the trend by reducing their carbon footprint. While some companies have decided to attempt to procure energy from clean energy sources, others have constructed on site power generating facilities. Still others have entered into agreements with independent power suppliers to provide them with renewable carbon free energy generation. Where some customers do not have resources, they have been able to purchase green tariffs, promising that some portion of the electricity derived will be from renewable carbon free sources. As a recent National Review article explained, companies taking these steps want to market their operations as "carbon-neutral" or powered by renewable energy, which may create a risk of a green washing lawsuit.[xxviii] The article explained that a green washing lawsuit is one where a plaintiff accuses a business of making false statements about its environmental, social, and governance practices to appeal to consumer interests in environmentally friendly and sustainable practices. The article goes on to explain that the causes of action in such lawsuits vary from case to case but can include claims of unfair and deceptive trade practices, fraud, and false advertising.[xxix] In 2012, the Federal Trade Commission (FTC) released its most recent set of green guidelines detailing the best practices for companies to avoid greenwashing litigation when marketing products and services. According to the article, the green guides explain that it is deceptive to make unqualified representations that a product or service is made with renewable energy unless virtually all significant manufacturing processes are powered by renewable energy or the marketer has purchased an equivalent output of renewable energy tariffs. While the FTC has not yet taken any enforcement action against companies for unsupported claims on these grounds, other plaintiffs, including consumers and advocacy groups have[xxx].

In Beyond Pesticides v. Exxon Mobile Corporation[xxxi], Beyond Pesticides sued Exxon Mobile Corporation (Exxon) for "false and deceptive marketing, misrepresenting to consumers that it had invested significantly in the production and use of clean energy and environmentally beneficial technology. In short, Beyond Pesticides alleged that Exxon's advertising relating to is investments in alternative energy is false and misleading because it overstates how much of Exxon's business is devoted to clean energy.

Beyond Pesticide's stated in its filing that Exxon's conduct violates the D.C. Consumer protection

procedures act by its false and misleading advertising. The lawsuit sought to enjoin this conduct and obtain attorney's fees and costs along with prejudgment interest.

While the case was originally filed in the Superior Court of the District of Columbia, Exxon removed the case to Federal Court. Beyond Pesticides then moved to remand the case to county court for fees and costs. The district court ultimately granted Beyond Pesticides' motion and remanded the matter to the Superior Court of the District of Columbia. According to Beyond Pesticides, Exxon was attempting to deceive the public into believing that a significant proportion of its overall business involved clean energy activities. This, according to Beyond Pesticides, amounted to "deceiving the public into believing that one of the largest petroleum companies in the world is committed to solving the climate crisis, while it continues to devastate the planet."[xxxii]

In yet another case, Earthworks v. Chevron Corporation[xxxiii], Earthworks filed a complaint alleging that Chevron described itself as a provider of "affordable, reliable, ever-cleaner energy to improve people's lives and enable human progress" all the while according to Earthworks they were simultaneously investing a mere .2% of their capital expenditures in low carbon sources from the year 2010 through 2018. In fact, Earthworks claims that Chevron was actually increasing its overall carbon emissions from crude oil, methane and oil equivalent productions from 2017 through 2019. The case remains pending at this time.

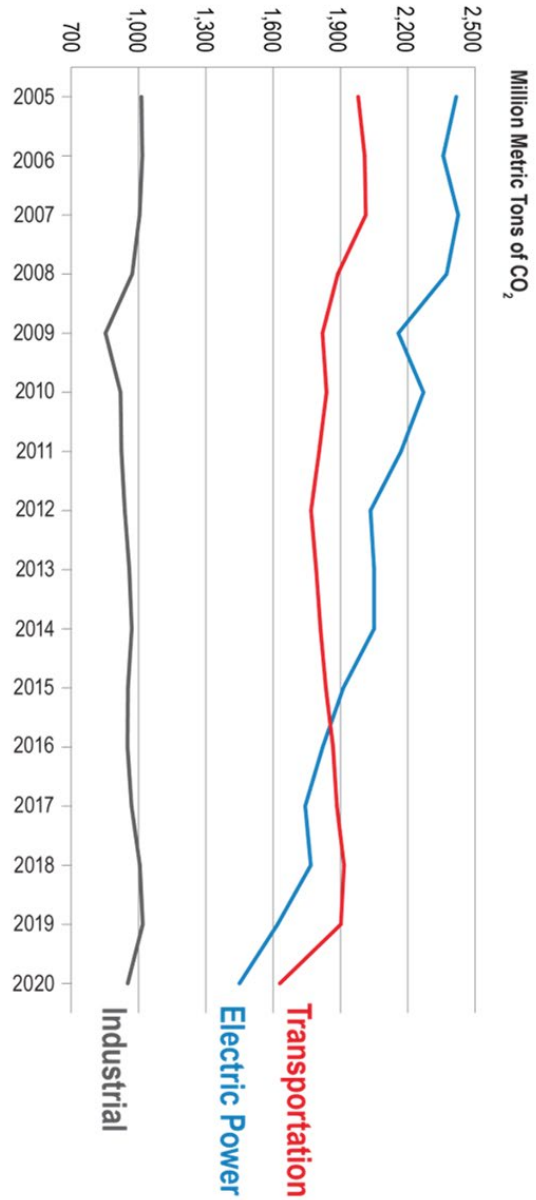
In yet another lawsuit, a Plaintiff filed a claim alleging that a company made misleading carbon footprint claims regarding its wool shoes.[xxxiv] The Plaintiff asserted that New York's general business law prohibits deceptive acts or practices and false advertising. The Plaintiff took issue with tools and methodologies used by the Company to calculate its product's environmental impact – the life cycle assessment (LCA) – used to estimate its products carbon footprint using the measurement system developed by the sustainable apparel corporation. The court found however that the Plaintiff's claims did not allege that the calculations were wrong or that the company falsely described them. The Court also found that the Plaintiff failed to allege that a reasonable consumer would expect the company to use another methodology or that a reasonable consumer would be misled by the Defendant's use of the LCA tool. The Court also rejected the contention that the Defendant had improperly omitted information relating to the wool industry's methane emissions, land occupation and eutrophication. The court dismissed the matter stating that the Plaintiff provided no basis to find it plausible that a reasonable consumer would expect anything different from the company. The Court also dismissed claims of breach of express warranty, fraud, and unjust enrichment on the same grounds and also because they were inadequately pleaded.

4. Conclusion

All of the foregoing information has provided you with a great deal of food for thought. Without a doubt this is a brave new world we are entering into with many, many unknowns yet to be discovered. Billions and billions of dollars are being thrown at the problem by governments not just in the US but across the world. "Going green" will not only have an effect on the way that we drive or heat our homes, it will also have an effect on the way we actually live our daily lives

including through the practice of law.

We have discussed a number of controversies on what the goals of any emissions reductions plan should be. One thing is for certain however, as the attached chart shows, carbon emissions have continued to fall and will continue to trend in that direction. Notably, most of the reduction in CO2 emissions have been in the transportation and electric power areas. Industrial emissions have remained relatively flat from 2005 to 2020.



Source: U.S. Department of Energy, Energy Information Administration, *Monthly Energy Review*, March 2021.

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[xxi] *West Virginia v. EPA*, 142 S. Ct. 2587, 2595, 213 L.Ed.2d 896, 903 (2022) citing 80 Fed. Reg. 64726

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