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-

THE GREAT DIVIDE: OPPOSING U.S. CLIMATE POLICY

GREEN & SUSTAINABLE **HUB**

INTRODUCTION

Climate change is a topic of growing geopolitical and economic significance. Europe and China have both committed to net zero emission target respectively by 2050 and 2060. **The U.S.,** which remains the largest cumulative carbon emitter since 1850, **is facing a pivotal moment that will determine the nation's action on climate change with global ramifications.**

The nation has always had ever-changing environmental commitments, switching from unilateralism to multilateralism and reneging from time to time on international climate agreements such as the Paris Agreement and the Kyoto Protocol**.** The incumbent President, Donald Trump, has played the "America First" strategy, which has weakened the U.S. leadership on climate diplomacy. He has also roll-backed several environmental regulations under the presence of supporting business.

The lack of Federal commitments and environmental targets has widened the gaps among individual States' environmental policies. Several States publicly support the Paris Agreement and are setting cap-and-trades programs or clean electricity targets.

Amid the growing U.S. electorate concerns on climate change, the two candidates are shaping different visions on climate change.

Donald Trump's agenda is noticeably silent on material environmental commitments, whereas Joe Biden is proposing a material green transition driven partially by the pressure of his former Democrat nominee opponents. The Clean Energy Revolution and his Environmental Justice Plan are strongly inspired by the Green New Deal and the B. Sanders chaired environmental Task Force.

Employment-related challenges and environmental issues are at the center of Joe Biden's plan. He announced a $2 trillion package to tackle climate change and create 10 million jobs in climate resilient industries. He also pledges to achieve carbon neutrality for the entire economy by 2050.

Joe Biden's agenda focuses mainly on the power generation and transportation sectors, including a power sector target for 100% carbon-free electricity by 2035. He plans to decarbonize the transportation sector by installing more public charging outlets and by developing new fuel economy standards. **On international environmental policies,** he envisages the U.S. as a model of energy transition by notably phasing out fossil fuel subsidies.

Joe Biden's record of voting in the U.S on environmental policies reveals that he holds relatively strong climate convictions. However, he has a balanced position on fossil fuels, promising only to ban hydraulic fracking on public lands. **An analysis of Joe Biden's program and speeches dismisses the scenario of a radical transition but it would be a U-turn compared to policies under the Trump administration**.

This report aims at providing an overview of the opposing Climate Change and Energy policy agendas of the two Presidential candidates.

We hope you enjoy the read.

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MAIN CLIMATE-CHANGE RELATED POSITIONS OF THE TWO CANDIDATES

The table below provides a summary of Joe Biden and Donald Trump's positions on several sectors and areas that would impact the U.S. Government and companies' climate action and commitment on environmental issues.

	JOE BIDEN *$2 trillion plan over 4 years on clean energy investments* ***Overall goal: carbon neutral economy by 2050***	**DONALD TRUMP** *No specific climate plan*
Employment	• **Creating jobs through infrastructure investments :** 10 million jobs through infrastructure plan (renewable energy infrastructure & climate resiliency industries)	• **Creating jobs through infrastructure investments:** 10 million jobs in 10 months, no mention to transition or green economy
Power Sector	• Decarbonizing the power sector by 2035 • Developing renewable energies sources	• Pushing for more oil and gas use
E-mobility	• Offering zero-emissions public transportation options in U.S. large cities (≥100,000 inhabitants) • Installing 500,000 electric vehicle charging stations nationwide by 2030 • Incentivizing the purchase of EVs (tax credit) • No ban on ICE vehicles	• Mentioning "Incentives to electric cars" without details
Building Standards	• Reducing the carbon footprint of the building stock 50% by 2035 & directing the development of new efficiency standards	• No mention
Climate Change Adaptation	• Building resilient infrastructures with "Rural for America" plan : adaptation and resilience capacity of the Caribbean region & investments	• No mention
Fossil Fuels & fracking	• No ban on fracking mentioned but plans to prohibit new permits for oil and gas drilling on federal land and offshore (incl. fracking on federal land). • No support for the Keystone XL pipeline • No phase-out coal strategy but seeks to support coal workers losing their jobs (pension and health insurance federal support) • Prohibiting fossil fuel subsidies	• Continuing deregulatory agenda for energy independence • Promoting fracking as a job creator that keeps energy prices low • Supporting Keystone XL pipeline • Expanding drilling for oil and gas on federal lands and offshore, including the Alaska National Wildlife Refuge
Climate diplomacy	• Rejoining the Paris Climate Agreement • Demanding a worldwide ban on fossil fuel subsidies • Prohibiting U.S. public institutions to invest in international coal plants or high-carbon fossil energy projects • Providing "green debt relief" for developing countries that make climate commitments	• Withdrawing from the Paris Agreement and finalizing the process
Relationship with China	• Penalizing American companies for moving jobs overseas and selling their products in the U.S. • Requiring China to stop subsidizing coal exports and outsource pollution	• Praising a more confrontational relationship • Ending the "reliance on China" & re-localizing 1 million manufacturing jobs from China (tax credit incentives) • Developing a "Made in America" tax credit

More details per sectors and areas are available in dedicated sections of the report.

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1. Donald Trump's legacy: in line with the U.S.' ever-changing climate stance

1.1 The U.S. leadership erosion with the "America First" diplomacy

Historically, the U.S. has a track record of ocilating climate policies, moving from strong environmental commitments to indifference, and from multilateralism to unilateralism on climate change diplomacy.

In 2017, President Trump announced a significant move in U.S. climate strategy with his intention to pull the U.S. out of the international Paris Agreement[1]**,** adopted by consensus on 12 December 2015 within the United Nations Framework Convention on Climate Change (UNFCCC) and originally signed by 196 parties.

On 4 November 2019, the first possible day the U.S. could issue such a notification under the Agreement's rules, the U.S. government notified the United Nations that it would withdraw from the Agreement, meaning that it will no longer be bound by its Nationally Determined Contributions (NDC). The 2016 U.S.' NDC stipulated, among other objectives "*The United States intends to achieve an economy-wide target of reducing its greenhouse gas emissions by 26%-28% below its 2005 level in 2025 and to make best efforts to reduce its emissions by 28%*". **The withdrawal process is due to be finalized 4 November 2020, interestingly the day following election day.**

The U.S. refused to ratify the 1997 Kyoto Protocol. Therefore, it is not the first time the U.S. has reneged on an international climate agreement. The U.S. was also the only G20 member **not to sign the climate change part of the communique at the 2019 summit in Osaka,** and has also decided to **pull out as a contributor to the Green Climate Fund (GCF)**[2]**.**

The erosion of American engagement in climate diplomacy has allowed other superpowers such as the EU and China to *de facto* become the world leaders on global environmental policy. Therefore, in comparison to G20 countries, the U.S. is lagging behind in climate action, ranking at the very bottom of the 2020 Climate Change Performance Index (CCPI), which calculates the climate protection performance using production-based emissions and publishes a ranking in relative terms[3] (see annex 10).

1.2 Donald Trump's traditional climate-skeptical stance: a relative backtrack?

Donald Trump depicted himself as a defender of employment and energy sovereignty, **as illustrated by incumbent President's "America First Energy Plan". In 2017.** Donald Trump said, *"Energy is an essential part of American life and a staple of the world economy. The Trump Administration is committed to energy policies that lower costs for hardworking Americans and*

[1] The Paris Agreement brings nations into a common cause to undertake ambitious efforts to combat climate change and adapt to its effects. It strengths the global response to climate change by keeping a global temperature rise this century well below 2°C above pre-industrial levels and to pursue efforts to limit the temperature increase even further to 1.5°C. It requires all parties to put forward their efforts through Nationally Determined Contributions (NDCs) which are governments' strategy frameworks towards a zero-carbon, climate-resilient economy.
[2] The CGCF is an international climate financing mechanism for the United Nations Framework Convention on Climate Change (UNFCCC).
[3] Four criteria are used: GHG Emissions (40% weighting); Renewable Energy (20% weighting); Energy Use (20% weighting); Climate Policy (20% weighting).

maximize the use of American resources, freeing us from dependence on foreign oil". **In the energy sector, he promoted energy extraction and production activities, including reducing the restriction on oil and gas extraction in national parks**.[4] **In 2016, Donald Trump claimed that lifting Barack Obama administrations' restrictions would increase workers' wages** by more than $30 billion following a report by the Institute for Energy Research[5], an oil-industry funded organization run by Trump's Administration.

Recently, Donald Trump tried to paint himself as a relative environmentalist, in an effort to win over voters', meaning that his environmental policy is limited to *ad-hoc* proposals that lack long-term consideration. Notably, in 2019, he signed "Save Our Seas 2.0 Act" that improves oceans waste management[6]. In August 2020, he announced a decade-long ban on oil drilling off the coast of Florida, Georgia and South Carolina. This decision was seen as a political move with the upcoming election to please Florida, a historical swing State with residents opposed to opening up the area to drilling rigs. Donald Trump's administration also signed the "Great American Outdoors Act", which enables national parks and other federal lands to repair and upgrade vital infrastructure and facilities to protect resources.

The Republican Party, which is increasingly aware of climate change issues, recently proposed several environmental measures, on extract of which are set out in the table below.

Table 1: Republicans' recent proposals on environmental issues

Proposition	Details	Sponsors
Legislative package (Mar. 2020) on carbon capture and sequestration[7]	● Establish forest management, reforestation, & other GHG sequestration practices ● Amend the Internal Revenue Code of 1986 to provide more credit for CO_2 sequestration ● Draw on federal funds for research & development	House Republican leader Kevin McCarthy
Growing Climate Solutions Act, June 2020[8]	● Encourage sustainable, climate-friendly farming & forestry practices by providing farmers, ranchers, and private forest landowners with access to private-sector capital ● Facilitate their participation in GHG credit markets	**Bipartisan bill**: Debbie Stabenow, Democrat of Michigan, and Lindsey Graham
The Blue Carbon for Our Planet Act [9]	● Strengthen federal research on blue carbon, improve, and set measurable targets for the protection and restoration of coastal blue carbon ecosystems	**Bipartisan bill:** Senator Mike Braun, Senator Lisa Murkoswki of Alaska, Sheldon Whitehouse, Democrat of Rhode Island
Resolution Text H. Res. 195[10]	● Recognize the conservative principle "*to protect, conserve, and be good stewards of our environment, responsibly plan for all market factors, and base our policy decisions in science and quantifiable facts on the ground*."	Group of 20 Rep. House Members led by Reps. Elise Stefanik, Carlos Curbelo, and Ryan Costello
Energy Advancement and Development / Innovations for Natural Gas (LEADING) Act of 2019[11]	● Prioritize research and development funding capture carbon emissions technology (Up to $50 million each year of existing funds granted to the Department of Energy)	Representative Dan Crenshaw, joined by Representatives Cuellar, Flores, Gonzalez, Lamb, Lucas and Walberg

[4] NY Times (2018), Fracking Booms on Public Lands (available here)
[5] Institute for Energy Research (2015), The Economic Effects of Immediately Opening Federal Lands to Oil, Gas, and Coal Leasing (available here)
[6] The legislation provides the U.S the ability to respond to marine debris events and clean up waste, working toward international cooperation and agreements and exploring new ways to manage and reuse plastic waste. It also establishes a Marine Debris Response Trust Fund for the National Oceanic and Atmospheric Administration (NOAA), the U.S scientific agency for ocean and atmosphere.
[7] The Hill (2020), House Republicans propose carbon capture and sequestration legislation (available here)
[8] U.S Gov (2020), The Growing Climate Solutions Act of 2020 (available here)
[9] The Blue Carbon for Our Planet Act
[10] U.S Congress (2018), Resolution Text H. Res. 195 (available here)
[11] U.S Congress (2019), LEADING Act of 2019, (available here)

The Commodity Futures Trading Commission (CFTC) published in 2019 a report on the climate risk in the financial system[12]. Titled "Managing Climate Risk in the Financial System"[13], this publication is the first that assesses climate risks to the financial sector under the Trump administration. The main recommendations are:

1. The review of laws about investment decisions using climate-related factors in retirement and pension plans covered by ERISA for example. This proposition should prevent the recent rule proposed by the Ministry of Labor to avoid consideration of ESG criteria in investment decisions. According to the Ministry of Labour, the integration of climate risk into decision-making minimizes the profitability of the investment, thus to the detriment of the end customer. Approximately $28.7 trillion of assets were managed under ERISA rules at 1Q20.
2. The integration of climate-related financial risks in the oversight functions of the Financial Stability Oversight Council (FSOC), including in its annual reports and other reporting to U.S. Congress
3. The development of a pilot programme of climate risk stress tests by bank regulators
4. Strengthening the role of the Security and Exchange Commission (SEC) in requesting the publication of climate risks of listed companies.

1.3 Environmental deregulation under Donald Trump's presidency

As of July 2020, nearly 70 environmental rules and regulations have been officially rolled back under the Trump's administration and more than 30 rollbacks are still in progress.

Table 2: Rollbacks on environmental issues during Donald Trump's presidency

	Completed	In progress	Total
Air pollution & emissions	19	8	**27**
Drilling and extraction	11	8	**19**
Infrastructure and planning	12	1	**13**
Animals protection	11	1	**12**
Water pollution	4	7	**11**
Toxic substances and safety	6	2	**8**
Other	5	5	**10**
All	**68**	**32**	**100**

Sources: The New York Times (July 2020), based on Harvard Law School, Columbia Law School researches

Please note that the rollbacks with * means more details are available in the annex 9.

Donald Trump has empowered the Oil and Gas sector*. On April 2019, Donald Trump signed two **executive orders facilitating the building of oil and gas pipelines and limiting the actions of the States that would be opposed to it**. The first order directs the EPA to reconsider a part of the Clean Water Act text. "Section 401" of the Act requires any oil or gas project that could potentially contaminate waters regulated under the act to receive state-level certifications and approvals. The second order asserts the authority of the President who has the authority to "**issue, deny, or amend" any permits for pipelines or other infrastructure projects that cross international borders**. Previously, that authority lay with the Secretary of State. Most notably, this decision would apply to decisions concerning TransCanada Corporation's controversial Keystone XL pipeline, greenlighted by the Trump administration.

The incumbent President has also eased methane limits*, rolling back limits on methane emissions regarding oil and gas operations implemented during the Obama administration. In

[12] Comodity Futures Trading Comission (2019), Press release 7963-19 (available here). The report was co-authored by investment banks, oil companies, agricultural & environmental experts.
[13] Climate-Related Market Risk Subcommittee (2020), Managing climate risk in the U.S financial system (available here)

2017, the Trump administration ordered a **reversal of a ban on oil and gas drilling in the Arctic and Atlantic oceans**, allowing offshore drilling.

In March 2017, Donald Trump signed an executive order and called on Scott Pruitt to take steps to dismantle the Clean Power Plan ("CPP")[14], a set of rules regulating energy plants powered by fossil fuels, which was intended to reduce GHG emissions from the power sector by 32% in 2030 compared to 2005 levels. The plan would have regulated CO2 emissions from existing fossil fuel-powered electricity plants, especially from coal-fired power plants which were the main target of the rules. **On June 2019, it was replaced by the** looser **"Affordable Clean Energy"** ("ACE") rule. The ACE does not set limits on power plant carbon emissions and calls for efficiency improvements instead. It encourages States to take initiatives on their emissions regulations standards and gives States three years to devise their own plans to reduce emissions.

Donald Trump also changed standards for Clean Cars and Loosened Emissions Standards for Cars and Trucks*. On March 2020, the Trump administration passed a rule on automobile fuel efficiency revising energy efficiency appliances standards and weakening regulations on lean vehicle standards. **It significantly weakened the 2012 rule requiring automakers to produce more fuel-efficient and less polluting vehicles**. At the same time, the Trump administration revoked California's authority to set auto emissions rules stricter than federal standards. California's rules are followed by 13 other States representing 1/3 of national auto market.

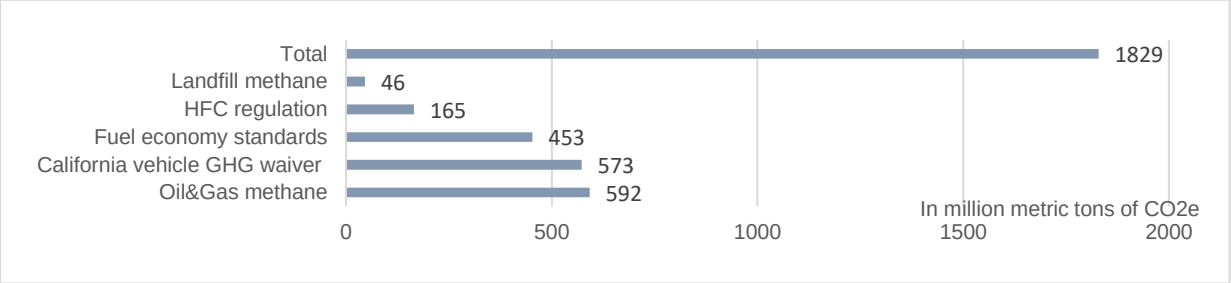
The Trump Administration also wound back regulations on hydrofluorocarbons ("HFCs"), a potent set of greenhouse gases. In 2015, Barack Obama implemented a regulation partially blocking the use of HFCs, to be in line with the Montreal Protocol and the 2016 Kigali Amendment, which is a multilateral agreement that sets targets to slash the use of HCFs. The Kigali Amendment, which went into effect in 2019, has not been ratified by the US. The Obama regulation was dismantled in 2017. In 2020, EPA finalized a rule called "Protection of Stratospheric Ozone: Revisions to the Refrigerant Management Program's Extension to Substitutes"[15], relaxing the requirements that owners and operators of refrigeration equipment have leak detection and maintenance programs for hydrofluorocarbons. Under this rule, appliances with 50 or more pounds of substitute refrigerants will no longer be subject to inspection requirements (leak inspection, reporting, etc.).

The current administration dismantled the U.S. Environmental Protection agency. Under Donald Trump's presidency, the **EPA made 166 criminal referrals in the 2018 fiscal year, a 60% reduction from 2011[16] and the lowest number of cases in 30 years**, explained by two factors: the measures are less stringent and the number of criminal investigators assigned to pollution cases has decreased. Donald Trump also **appointed Andrew Wheeler,** a former coal lobbyist**, as EPA Administrator. He also dismissed the scientific Particulate Matter Review Panel** in 2018 that advises the EPA about safe levels of pollution in the air caused principally by coal burning and industrial processes[17]. Recently, in March 2020, Donald Trump **proposed a rule that limits the scientific research used in the federal rulemaking process.** The agency released a draft, called "Strengthening Transparency in Regulatory Science" limiting scientific and medical researches primarily used to decide on regulations. The measure would require scientists to disclose all of their raw data, including confidential medical records. EPA could therefore justify rolling back rules on behalf of citizens' privacy protections.

[14] More details from the U.S EPA here.
[15] EPA, (2020), "Protection of Stratospheric Ozone: Revisions to the Refrigerant Management Program's Extension to Substitutes", available here.
[16] In April 2018, there were only 140 special agents in EPA's Criminal Investigation Division and the number has dropped to 130 in January 2019, according to Public Employees for Environmental Responsibility (PEER) (2019), "Criminal Enforcement Collapse at EPA", available here.
[17] The panel was composed of 20 independent experts.

Surprisingly, the implemented and planned policy rollbacks under the Trump administration (if left in place), are forecast to increase U.S. emissions "only" by 3% by 2035 than current projections indicate. This is equal to an increase in U.S. emissions by 1.8 Gigatons by 2035 (this amount is around 1/3 of U.S. current total emissions[18]).

Figure 3: Cumulative GHG emissions impact of regulatory rollbacks through 2035



Source: Rhodium Climate Service (2020)

1.4 The absence of environmental measures in Donald Trump's second term agenda

Recently, the incumbent President Donald Trump has been trying to paint himself as an environmentalist, with air and water pollution concerns. While rolling back several policies on water and air pollution, he paradoxically signed the Water Infrastructure Act[19]. During the first Presidential debate on September 29 2020, he claimed, "*I want crystal clean water and air, we now have the lowest carbon … if you look at our numbers now we are doing phenomenally*", "*I believe we have to do everything we can to have immaculate air, immaculate water and do whatever else we can that's good*." but called the Paris Agreement a "*disaster*".

His 2020 political agenda does not mention climate change[20], meaning that the Trump administration could potentially roll back more climate change related regulations if re-elected. On his campaign website, one of the 49 measures he mentioned is "*Continue to Lead the World in Access to the Cleanest Drinking Water and Cleanest Air*". He also pledges to "*Continue Deregulatory Agenda for Energy Independence*", which would certainly lead to increasing emissions related to the energy. For these two measures, no further details are provided in his political agenda. **During the first Presidential debate, Donald Trump** argued that he rolled back the Clean Power Plan because "*it was driving energy prices through the sky*" and argued that he dismantled cars standards because they made U.S. cars less affordable. **On his stance on climate change science, Donald Trump remained unclear**: when the moderator Chris Wallace asked him "*What do you believe about the science of climate change*?", Donald Trump was elusive.

The "Trump-Wheel plan" includes a sharp decrease in the U.S. environmental budget: EPA's Fiscal Year 2021 Annual Performance Plan and Budget of $6.658 billion represents a $2.399 billion or 26% percent reduction from the Agency's Fiscal Year 2020 Enacted Budget level.[21] This includes a cut of almost $500m (-43%) compared to 2020, from program grants for State Grant and National Program environmental programs. (annex 11). The proposed budget plans to slash more than $100,000,000 from the agency's Superfund cleanup program compared to 2020 enacted budget (that reaches

[18] Rhodium Group is an independent research provider combining economic data analytics and policy insights in public and private sectors. Rhodium Group (Sept. 2020), "The Undoing of US Climate Policy: The Emissions Impact of Trump-Era Rollbacks", available here.
[19] America's Water Infrastructure Act of 2018 provides for water infrastructure improvements throughout the country in the areas of flood control, water resources development, maintenance and repair of dams and reservoirs, ecosystem restoration, public water systems, financing of improvements, hydropower development, technical assistance to small communities. Available here
[20] See his 2020 political agenda & campaign website here.
[21] Fiscal year 2021, EPA Budget in Brief, available here.

$794.74m). On other program projects such as “Clean Air program” or on Research programs such as for “Air and Energy” or “Sustainable Communities” budgets’ proposals were drastically cut down.

1.5 Mike Pence’s strong support for fossil energy companies

In our investigation, we decided to also analyze Vice-President candidates. Unlike Donald Trump, Mike Pence has a long and specific history on environmental issues. He served in the United States House of Representatives from 2001 to 2013 before becoming Governor of Indiana in 2013.

As congressman, Mike Pence voted for pro-environment positions just 4% out of a total of 221 votes on environmental issues, according to the League of Conservation Voters:

- 8 votes about the conservation and restoration of oceans and forest.
- 1 vote about climate change action, in favor of an amendment reducing funding for fossil fuel research and development programs by $554 million[22] in 2012.

Mike Pence’s environmental record reveals his broad support for oil, gas and coal industries and a strong opposition to the Paris Agreement. In 1990, the Vice President declared that global warming is a “myth” and that international treaties such as the Kyoto Protocol were “disasters”[23]. Although his position on climate change has slightly changed since he recognized in 2016 that human activities have an influence on climate change[24], Mike Pence has typically been portrayed as being against a transition in the fossil fuel sector and legislations regulating greenhouse gas emissions.

In 2009, he voted against the cap-and-trade bill to limit carbon dioxide emissions[25]. In 2010, he supported more offshore drilling.. **In 2015, Mike Pence joined a chorus of conservative governors to block the implementation of the Clean Power Plan regulated by the Environmental Protection Agency[26] (“EPA”)**. He also encourages States to fight greenhouse gas rules for power plants. Mike Pence wanted to give less power to the EPA to impose a federal plan. He said "We must continue to oppose the overreaching schemes of the EPA until we bring their war on coal to an end.". That same year, he defended the Keystone XL pipeline, which he said should have created 42,000 jobs[27].

Mike Pence states that there is a conflict between regulations to promote ecological transition and job creation in the U.S. He strongly criticizes Barack Obama's regulatory policies and **compares Joe Biden's plan to the Green New Deal, which, according to him, would have a negative impact on the purchasing power and jobs of households in the U.S**.

For Mike Pence, markets deregulation would trigger the creation of innovations that would solve global warming problems. During the Vice President's debate on the 7th October, Mike Pence certified: "We've made great progress reducing CO2 emissions through American innovation and the development of natural gas through fracking".

Just like Donald Trump, Mike Pence is putting more emphasis on land protection than on the fight against climate change. In October 2020, during the debate with Kamala Harris, he put forward **the signing of the Outdoors Act in 2020, which will invest in public lands** and refuses to admit that climate change is an existential threat.

[22] League of Conservation Voters (2012), Fossil Fuel Funding House Roll Call Vote 317 (available here)
[23] Web Archive, Mike Pence Congress (available here)
[24] CNN Politics (2016), Mike Pence appears at odds with Trump on climate change (available here)
[25] U.S Congress (2009), American Clean Energy and Security Act of 2009 (available here)
[26] IndyStar, Pence encourages states to fight greenhouse gas rules (available here)
[27] Greenpeace report (2016), Mike Pence record on climate change (available here)

1.6 States' environmental initiatives on the rise

In the absence of Federal leadership, a number of the States' are taking independent paths on environmental issues. However, market regulation fragmentation hinders strategic planning for companies that must navigate a patchwork of discrepant regulations and incentives.

Several States have passed bills that aim at reaching 100% clean electricity by 2050, while enacting other environmental measures and standards. These States plan to invest billions of dollars to shift away from fossil fuels, the major driver of global warming.

Table 4 : State laws on Clean Energy standards

State	Senate Bills passed and signed by Governors
California	Senate Bill 100 requires a 100% carbon free power grid by 2045, and further mandated that 60% of electricity come from renewable energy other than hydro by 2030. Recently introduced A.B.915 would expand the mandate to 80% zero carbon energy by 2038.
Nevada	Senate Bill 358 mandates that 50% of power from investor owned utilities (covering more than 95% of State load) come from renewable sources by 2030, while setting a target of zero carbon power by 2050.
New Mexico	Senate Bill 489 sets a target that all retail sales of electricity in New Mexico from investor owned utilities be zero carbon by 2045, with up to 80% renewable if cost justified. Distribution cooperatives, serving roughly 25% of State load, are exempted.
Washington	Senate Bill B5116 requires all electricity generation in the State to be carbon neutral by 2030 and completely carbon free by 2045.

Source: Clean Air Task Force (2019), "Fact sheet

In addition, a coalition of States lead by California, New York and Washington has been created in June 2017, called "The United States Climate Alliance"[28] and gathers 25 States which made up over 50% of the U.S. GDP. These States are committed to upholding the climate objectives of the 2015 Paris Agreement, of the U.S. goal of GHG reduction defined in the U.S. United Nations Framework Convention on Climate Change.

Ten Northeast[29] States jointly cap power sector emissions through the Regional Greenhouse Gas Initiative (RGGI), setting a price on carbon for the power sector, such as California, which has set an economy-wide cap-and-trade system (see State Factsheet in Annex 12). The RGGI is the first mandatory, market-based CO2 emissions reduction program in the U.S. Within the RGGI States, fossil-fuel-fired electric power generators with a capacity of 25 megawatts or greater are required to hold allowances equal to their CO2 emissions over a three-year control period. For the year 2020, the RGGI CO2 cap namely, the budget for CO2 emissions from the power sector, is 96,175,215 tons of CO2 and the RGGI adjusted cap is 74,283,807 tons of CO2.[30] As of 2020, the program resulted to a reduction of covered emissions by about a half compared to 2005, and investments from allowance auctions have generated almost $3 billion in economic value for the member States[31].

Thirty States[32] and Washington District have also been very active regarding Renewable Portfolio Standards (RPS) and Goals, which require that a specified percentage of the electricity that utilities sell comes from renewable resources. Roughly half of the growth in U.S. renewable energy generation since the beginning of the 2000's can be attributed to these requirements[33]. States' RPS policies vary widely on RPS targets, the entities they include, and other characteristics. For instance, Iowa and Texas require specific amounts of renewable energy capacity rather than percentages.

[28] The U.S Climate Alliance is composed of California, Colorado, Connecticut, Delaware, Hawaii, Illinois, Maine, Maryland, Massachusetts, Michigan, Minnesota, Montana, Nevada, New Jersey, New Mexico, New York, North Carolina, Oregon, Pennsylvania, Puerto Rico, Rhode Island, Vermont, Virginia, Washington and Wisconsin. The "U.S Climate Alliance 2019 Annual Report" unveils that between 2005 and 2017, Alliance States are outpacing non-Alliance States in emission reduction (respectively 16% *versus* 7% for the rest of the country).
[29] Connecticut, Delaware, Maine, Maryland, Massachusetts, New Hampshire, New Jersey, New York, Rhode Island, and Vermont.
[30] RGGI held its 49th quarterly allowance auction on September 2 2020, resulting in a clearing price of $6.82 per short ton for the 16.2 million tons of CO2 allowances sold.
[31] Center for Climate and Energy Solutions (2020), "Market-based State Policy", available here.
[32] Arizona, California, Colorado, Connecticut, Delaware, Hawaii, Illinois, Iowa, Maine, Maryland, Massachusetts, Michigan, Minnesota, Missouri, Montana, Nevada, New Hampshire, New Jersey, New Mexico, New York, North Carolina, Ohio, Oregon, Pennsylvania, Rhode Island, Texas, Vermont, Virginia, Washington and Wisconsin.
[33] Electricity Markets & Policy Energy Technologies Area (2018),"U.S Renewables Portfolio Standards: 2018 Annual Report", available here.

Fourteen States[34] have requirements that 50% or more of the electricity that utilities sell comes from renewable resources. Table 6 details the States with Renewable Portfolio Standards goals from the National Conference of State Legislatures website[35].

Table 5: States' Renewable Portfolio Standards (RPS)

State	Requirements / Targets	Applicable sectors
Arizona	15% renewable by 2025	Investor-owned utility, retail supplier
California	44% renewable by 2024; 52% by 2027; 60% by 2030 & requires 100% clean energy by 2045	Investor-owned utility, municipal utilities.
Colorado	30% renewable by 2020 (for Investor-owned utilities); 10% or 20% for municipalities and electric cooperatives depending on size; 100% clean energy by 2050 for utilities serving 500,000 or more customers	Investor owned utility, municipal utilities, cooperative utilities
Maine	80% renewable by 2030; Statewide target of 100% renewables by 2050	Investor-owned utility, retail supplier
New York	70% renewable by 2030; 100% zero-emissions electricity requirement by 2040	Investor-owned utility, municipal utilities, cooperative utilities, retail supplier
Ohio	8.5% renewable by 2026	Investor-owned utility, retail supplier
Texas	5,880 MW renewable by 2015. 10,000 MW by 2025	Investor-owned utility, retail supplier
Washington	15% renewable by 2020; 100% greenhouse gas neutral by 2030; 100% renewable or zero-emitting by 2045	Investor-owned utility, municipal utilities, cooperative utilities

Source: National Conference of State Legislatures (2020), "State Renewable Portfolio Standards and Goals"

[34] California, Colorado, Hawaii, Maine, Maryland, Massachusetts, Nevada, New Mexico, New Jersey, New York, Oregon, Vermont, Virginia, Washington, as well as Washington, D.C. Puerto Rico and the Virgin Islands
[35] National Conference of State Legislatures (2020), "State Renewable Portfolio Standards and Goals", available here.

2. Under Joe Biden presidency: a U-turn of the U.S. climate policy?

2.1 A political record with relatively strong environmental commitments

Joe Biden's record of votes on environmental policies reveals that he holds relatively strong climate convictions. According to the "League of Conservation Voters", which collect and analyze environmental votes for each Congress member since 1988, Joe Biden voted favorably to 88% of them in the U.S Senate (see table below)[36]. **His background depicts a politician in favor of a political consensus regarding the environmental crisis.**

In 1987, Joe Biden made his first strong proposal on climate change when he sponsored one of the first bills on the topic in the Senate, which was called the Global Climate Protection Act. The bill directed the Government to develop a strategy to deal with global warming. Although the bill did not pass, it became law when President Reagan signed the Foreign Relations Authorization Act in 1987.

Table 6: Joe Biden's votes on environmental issues before his 2008 nomination as Vice President

Regulation	Joe Biden's vote	Details
Requiring Environmental Protection Agency's risk assessments[37]	Yes	Safe Drinking Water Act Amendments of '94; vote number 1994-117 on May 18, 1994 : require the Administrator of the Environmental Protection Agency (EPA) to make capitalization grants to States to establish State drinking water treatment revolving loan funds.
Continuing desert protection in California[38]	Yes	Invoke cloture on the California desert protection bill[39].
Reducing funds for road-building in National Forests[40]	Yes	Cut by $10 million the $47.4 million fund provided for Forest Service road construction and eliminate the purchaser credit program.(which provides credits to timber companies to offset what they owe the government)
Including oil & gas smokestacks in mercury regulations[41]	Yes	Disapprove the rule submitted by the EPA in 2005, relating to the removal of coal- and oil-fired electric generating units from the list of major sources of hazardous air pollutants under the Clean Air Act. The EPA's Clean Air Mercury Rule: • Limits smokestack emissions in a two-phase program founded on a market based capping system • Calls for the first cap to limit mercury emissions to 38 tons in 2010 Requires the second and final cap to begin in 2018 and stay fix at 15 tons
Congressional budget [42]	Cosponsored	Add funds for the Environmental Protection Agency

Source: Authors, Natixis Green & Sutainable Hub (2020)

Joe Biden has been at the forefront of several environmental legislations under the Obama administration, which started out the gate with a massive investment in clean energy under the "American Recovery and Reinvestment Act" of 2009[43]. Joe Biden was tasked with overseeing its implementation.

[36] League of Conservation Voters (2019), National environmental scorecard senator Joe Biden (available here)
[37] Safe Drinking Water Act Amendments of '94; vote number 1994-117 on May 18, 1994
[38] California Desert Protection Act of 1993; Bill S. 21; vote number 1994-326 on Oct 8, 1994
[39] "Invoking cloture" means "ending the discussion and calling a vote." *A NO would continue discussing whether to terminate the existing program, and hence is considered pro-business and/or anti-environment*
[40] Bill HR.2107; vote number 1997-242 on Sep 17, 1997
[41] EPA's Clean Air Mercury Rule; Bill S J Res 20; vote number 2005-225 on Sep 13, 2005
[42] S.Amdt.1488 — 97th Congress (1981-1982)
[43] . The Recovery Act allocated more than $90 billion via loans, loan guarantees, tax credits, and grants for projects like weatherizing homes.

Joe Biden has promoted the idea of natural gas as a stepping-stone away from “dirtier” fuels like coal and gasoline. In 2008, he was the lead sponsor of a "Sense of the Senate" resolution that would enjoin the U.S. to participate in UN climate change negotiations. He also co-sponsored Boxer-Sanders Global Warming Pollution Reduction Act, which was at the time one of the strictest climate laws in the Senate. It would have created a cap and trade system for GHG emissions, requiring a 15% reduction in U.S. emissions to 1990 levels by 2020, and to 80% below 1990 levels by 2050.

On this basis, Joe Biden has always had a strong ecological awareness but should not be confused with the more radical left-wing elements of the U.S. Democratic Party. Indeed, Joe Biden maintains shadow areas over his position on fossil fuels as his plan did not lay out in detail a trajectory for phasing out oil, coal or natural gas production (see part 2.3.1).

2.2 What prospect for U.S. environmental and climate policies under Joe Biden administration?

2.2.1 What does Joe Biden propose?

Joe Biden is embracing climate action in his political agenda. On July 14th 2020, he unveiled a **$2 trillion economic plan over four years focusing on clean energy investments and green jobs creation**. The plan for a “Clean Energy Revolution And Environmental Justice”[44] calls for building a "Modern, Sustainable Infrastructure and an Equitable Clean Energy Future" and aims at **achieving carbon neutrality for the power sector by 2035 and for the entire country by 2050**. Joe Biden demonstrated his ability to listen and reach consensus by integrating employment and a fair transition at the heart of his agenda.

We remind readers that when it comes to **energy, environment and infrastructure** (water, electricity, roads, and railways) policies, the **States have extensive institutional powers**. For example, the States control the remuneration of transport and distribution infrastructure of electricity via Public Utilities Commissions (PUCs) and can influence the “local” electricity production mix through multiple regulatory provisions (including the possibility of creating carbon allowance markets, setting green energy quotas - green certificates – that local power utilities must comply with when supplying end customers, etc.). **The Federal Government has a “residual” influence that can be exerted through the production of standards binding on all States** (as illustrated by the Clean Air Act, the toughening of which Joe Biden’s program calls for) or through the Federal tax system (e.g. the U.S. tax credits in place since the 2000s to support the development of renewable energies).

Joe Biden's energy and infrastructure program revolves around the concept of **“climate and environmental justice”** through the greening and modernization of existing assets, whether for mobility, buildings, electricity networks and water for example Joe Biden’s plan promises to upgrade **4 million buildings and weatherize 2 million homes over 4 years for the residential sector.**

2.2.2 Employment challenges at the heart of the climate plan

In the aftermath of the COVID-19 crisis, in September 2020, the U.S. unemployment rate reached 8.4%[45]. Facing the crisis, Joe Biden did not decouple environmental policies with employment and social justice ones since his plan does not dissociate climate change from social issues, and pledges the creation of **10 million new jobs related to green energy, including 1 million in the automotive sector and 1 million in the construction sector, notably for renovation.**

This strategy is inspired by the Green New Deal (see annex 14) , which was co-sponsored by 3 of the last 7 candidates in the Democratic Primary. The Green New Deal is a **14-page text proposal**

[44] Joe Biden website (2020) The plan for a clean energy revolution and environmental justice (available here)
[45] It is twice more than a year ago. Source: U.S Department of labor (sept 2020) Bureau of labor statistic (available here)

identifying the consequences of climate change and the objectives that must be achieved by the U.S, taking into account both the social and economic stakes. It is a strong ideological project that supports the ecological transition as a springboard for job creation and economic growth. The plan was developed by New Consensus, a think tank founded by several left-leaning activists in 2018, and carried by representative A. Ocasio Cortez and Senator E.D. Markey in front of the House of Representatives in July 2019.

Table 7: Positions of the candidates for the democratic primary regarding the green new deal

	Joe Biden	Pete Buttigieg	Amy Klobuchar	Bernie Sanders	Tom Steyer	Elizabeth Warren	Andrew Yang
Position	Support	Support	Co-sponsor ✓	Co-sponsor ✓	Support	Co-sponsor ✓	Support

Source: Authors, Green & Sustainable Hub, Natixis (2020)

We note, on a semantics perspective, that "employment" is one of the most frequently used word on Biden's climate plan (33 times versus 26 times for "green" and 32 times for "union").

To guarantee a fair transition, Joe Biden proposes job training in **climate resilient industries such as coastal restoration** (resilient infrastructure such as bridges withstanding strong winds and roads that do not wash out during storms and floods). He also pledges to **develop natural solutions** (such as tree plantings on a large scale to combat urban heat and the health impacts), and technological solutions to easily assess risk. Indeed, job training is paramount for an effective environmental justice plan to avoid massive job losses associated with the transition from high-carbon sectors. Meanwhile Joe Biden proposes **to invest in coal and power plant working communities to facilitate the transition to carbon-free sectors** (early retirement schemes and health insurance coverage[46]).

However, the 10 million employment figure proposed by the candidate is difficult to reconcile given the lack of details regarding the transition in the electricity and transport sectors, as well as fossil fuels dependant activities.

2.2.3 An ambitious 100% carbon-free power sector target by 2035

In 2019, natural gas, including shale gas, was the largest source of energy, with about 38%, followed by coal with about 23% (see Part 3.1). To achieve his target for 100% carbon-free power sector by 2035, Joe Biden will create pollution limits for new and existing oil and gas operations, double down on Federal investments, develop tax incentives for Carbon Capture, Utilization, and Storage and improve carbon capture research. Joe Biden does not necessarily support energy sobriety but bets on wind, solar, hydropower, nuclear power, battery storage, carbon capture technology and energy efficiency programs to achieve carbon neutrality.

How would a 100% carbon neutral power sector be funded?

Joe Biden's energy decarbonization plan is be aided by the increasing cost competitiveness of renewable energy (that has already fallen sharply during the last two decades). Solar photovoltaics ("PV") shows the sharpest cost decline over 2010-2019 by 82%, followed by concentrating solar power ("CSP") by 47%, onshore wind by 40% and offshore wind by 29% according to the International Renewable Energy Agency[47]. This could encourage electricity suppliers to commit to an energy transition more quickly.

[46] "U.S. coal mining employment fell from a high of 92,000 employees in 2011 to 54,000 employees in 2018, with the most dramatic decrease in the Appalachian region." (EIA).
[47] International Renewable Energy Agency (2019), Renewable Power Generation Costs in 2019 (available here)

Joe Biden intends to finance his plan by partially reversing Donald Trump's corporation tax cuts, reducing incentives for tax havens, evasion and outsourcing, closing tax code loopholes and ending subsidies for fossil fuels. In the U.S., direct and indirect fossil fuels accounted for $649 bn in 2015[48].

Who are the supporters of the goal for 100% carbon-free power sector by 2035?

- The Green New Deal's supporters, as the proposal is inspired from it (Bernie Sanders, Alexandria Ocasio-Cortez and Elizabeth Warren)
- The Democratic Party, since its agenda (see part 2.4.2) plans to install 500 million solar panels, including 8 million solar roofs and community solar energy systems, and 60,000 wind turbines within 5 years.
- States committed to energy decarbonization goals (see part 1.6)

What are the main barriers to achieve the goal?

The Conservative branch of the Republican Party seems fiercely opposed to an energy transition, arguing it will destroy jobs and increase the cost of energy. Elizabeth Harrington, spokeswoman for the Republican National Committee, compared the pandemic lockdown and the Green New Deal, criticizing Democrats for thinking that *"a pandemic is the perfect opportunity to kill millions more jobs"* with carbon-cutting plans.

Are the market players ready to be aligned with the target?

The missing piece is the coordination between Federal investments and the strategy of major electrical utilities companies. Joe Biden is clearly ahead of the players in the sector. Many of U.S. major electric utility companies have pledged zero emissions, albeit with a target date later than Joe Biden's one. For example, Duke Energy, Southern Co, Dominion Energy and Xcel Energy representing 143 700 million megawatts generation, are targeting a deadline of 2050 (see table below).

Table 8: Climate Goals of TOP 20 U.S. electric & gas utilities

Institution name *Primary industry*	**Market cap. ($B)**	**Climate/carbon goal**
EXISTING NET ZERO TARGETS		
Dominion Energy Inc. *Multi-utilities*	68.13	Net zero GHG emissions by 2050
Duke Energy Corp. *Electric utilities*	58.71	Reduction of carbon emissions of at least 50% by 2030 from 2005 levels and net zero emissions by 2050
Southern Co. *Electric utilities*	54.75	Reduction of carbon emissions of at least 50% by 2030 from 2007 levels and net zero emissions by 2050
Sempra Energy *Multi-utilities*	34.30	100% renewable generation by 2045. By 2030, reduction of fugitive emissions from its natural gas transmission & distribution systems by 40% from 2015 levels and delivery of 20% renewable natural gas
Xcel Energy Inc. *Electric utilities*	32.82	Reduction of 80% of carbon emissions by 2030 from 2005 levels and 100% carbon-free electricity by 2050
Eversource Energy *Electric utilities*	28.52	Carbon neutrality by 2030
WEC Energy Group Inc. *Multi-utilities*	27.65	Reduction of 70% of carbon emissions from its generation fleet by 2030 from 2005 levels and net-carbon neutral by 2050
Public Service Enterprise Group Inc. *Multi-utilities*	24.86	Reduction of 80% of its power fleets' carbon emissions by 2046 from 2005 and achieve net zero carbon emissions from that fleet by 2050
Consolidated Edison Inc. *Multi-utilities*	24.03	100% clean electricity by 2040
DTE Energy Co. *Multi-utilities*	20.71	Reduction of 80% of emissions by 2040 from 2005 levels and net zero emissions by 2050
CMS Energy Corp *Multi-utilities*	16.72	Reduction of carbon emissions from the electricity generation of 90% by 2040 from 2005 levels and achieve net-zero emissions from that fleet by 2040. For the gas delivery system, net-zero methane emissions by 2030
Avangrid Inc. *Electric utilities*	12.97	Carbon neutrality by 2035
Pinnacle West Capital Corp. *Electric utilities*	8.32	100% carbon-free electricity by 2050 & clean energy comprise 65% of its resources mix by 2030 with 45% of that from renewable generation

[48] IMF (2019), Global Fossil Fuel Subsidies Remain Large: An Update Based on Country-Level Estimates (available here)

NO NET-ZERO TARGETS		
NextEra Energy Inc. *Electric utilities*	117.55	Reduction of 67% of its carbon emissions rate by 2025 from 2005 levels (reduction of about 40% in absolute carbon emissions)
American Electric Power Co. Inc. *Electric utilities*	39.47	Reduction of 70% of carbon emissions by 2030 and 80% by 2050 from baseline levels in 2000.
Exelon Corp. *Electric utilities*	35.36	Reduction of 15% of emissions from internal operations by 2022 from 2015 levels
FirstEnergy Corp. *Electric utilities*	21.01	Reduction of 90% of carbon emissions by 2045 from 2005 levels
PPL Corp. *Electric utilities*	19.86	Reduction of carbon emissions from the electric utility business of 80% by 2050 from 2010 levels
Entergy Corp. *Electric utilities*	18.78	Reduction of 50% of emissions intensity of utility-owned electric generation by 2030 from 2000 levels
Ameren Corp. *Multi-utilities*	17.37	Reduction of 80% of CO2 emissions from the utility generation fleet by 2050 from 2005 levels.

Source: S&P Global, "Path to net zero: Cracks appearing in natural gas' role as bridge fuel" (July 2020)

Potential consequences of a 2035 net neutrality for the power sector

We used a study[49], published by Goldman School Public Policy to analyze the consequences of a net-carbon electricity sector in 2035. The study compares a scenario where 90% of the U.S. electrical system would be carbon-free called the "Clean Grid" with a scenario where there are no new policies in place for the energy transition called "the No-New-Policy" scenario. Although the "Clean Grid" scenario considered differs by 10% from Joe Biden's plan, the study provides us with a fair idea of the scale of changes that such a scenario could require.

Domestic economic impacts:

Joe Biden's plan would have a positive impact on the renewable energy sector (solar, wind, energy storage) in addition to their increasing competitiveness. Major renewable energy companies such as Siemens, Vestas, GE Energy or NextEra Energy Inc., could benefit from this measure. According to the study, to achieve a 90% clean grid by 2035, 1,100 GW of new wind and solar generation must be added, averaging about 70 GW per year. In comparison, in 2019, about 4,118 GW of electricity were generated at utility-scale electricity generation facilities in the United States.

Domestic social impacts:

- **Job creation**: 90% Clean Grid could create 500 000 net new jobs each year compared to the no-new-policy scenario. The decrease of about 100 000 fossil fuel operations jobs is offset by the increase of 600 000 wind and solar construction jobs per year. **However, this requires a transfer of labor, a supply of training and support for job losses** that are neither clearly specified in the study nor in Joe biden's climate plan.
- **Households' electricity costs:** the electricity costs from the 90% Clean-Grid scenario are lower than today's costs. The base wholesale electricity cost under the 90% clean case is 4.6 cents/kwh, about 10% lower than the 5.1 cents/kwn in 2020. **However, measures must be put in place to ensure that lower wholesale costs translate into lower retail electricity prices by keeping the cost of distribution at the same level.**
- Thanks to pollution reduction from reduction of fossil fuel production, by reducing nitrogen oxide (NOx) and sulfur dioxide (SO2) emissions by 96% and 99%, the 90% clean-grid could also avoid a $1.2 Tn in health and environmental damages through 2050.

Domestic environmental impacts:

The achieved goal could result in a drastic reduction of the **world's net carbon emissions by 5% by 2030** (representing 1,756 billion tons). The power sector accounts for nearly 1/3 of U.S. CO2 emissions, almost as much as the transport sector[50].

[49] Goldman School Public Policy (2020), 2035 Report: Plummeting solar, wind and battery costs can accelerate our clean electricity future (available here)
[50] EPA (2018) Inventory of U.S. Greenhouse Gas Emissions and Sinks (available here)

2.2.4 On the road to e-mobility

Joe Biden said "*I think we can regain possession of the 21st century market by moving to electric vehicles"*. His climate plan aims at creating **one million new jobs in the American auto industry, domestic auto supply chains, and auto infrastructure, from parts to materials to electric vehicle charging stations and investing in US autoworkers**. To achieve this goal, Joe Biden intends to:

- Set a GHG reduction target from transportation by preserving and implementing the existing Clean Air Act.
- Develop **rigorous new fuel economy standards** aimed at ensuring 100% of new sales for light- and medium-duty vehicles will be electrified.
- Support the deployment of more than **500,000 new public charging outlets** by the end of 2030.
- Provide every large American city (with 100,000 or more residents) with high quality, zero-emissions public transportation.
- Restore the full electric vehicle tax credit to incentivize the purchase of these vehicles.

Who are the supporters of this measure?

- Bernie Sanders & Elizabeth Warren, who might be figures in a Biden Administration, proposed previously a direct ban on fossil fuel vehicles.
- Mining companies, as they are putting pressure on the Congress to vote a law to streamline the granting of operating permits and to fund geological studies permitting them to participate in the electric vehicle supply chain[51].
- 15 American States and Washington D.C, since they have announced that 100% of their new medium and heavy vehicles will be electric as of 2050[52] and especially the State of California which will ban the sale of Internal Combustion Engines vehicles by 2035[53].

What are the barriers for transition towards e-mobility?

Demand is not keeping the pace: In the U.S., the sale of electric vehicles and plug-in hybrids fell by 6.8% in 2019 compared with 2018. Electric cars account for around 1% of the total fleet, which is much lower than in Europe[54].

Federal policies in favor of electric vehicles have been impeded over the last years. The economic incentives that have helped electric vehicles increase their market share in America are in jeopardy. For instance, in Colorado, a bill tabled in early February would eliminate the $5,000 tax credit for the purchase of such a vehicle and in Indiana, a bill was introduced in January to introduce an annual tax of $150 for electric vehicles.

Domestic economic impacts:

The transition to electric cars could disrupt the automotive industry in the U.S. The Democratic Party's draft agenda proposes to transition 3 million vehicle fleets to zero-emission vehicles and a renew of the entire fleet of 500,000 school buses to be American-made. We assume that the electric car industry will grow with the support of Joe Biden's Federal policy. However, the limited strike force of the executive branch will not be enough to drive the private market to transition to electrical vehicles.

[51] Reuters (2019), Miners push for U.S. Congress to vote on electric vehicle supply chain bills (available here)
[52] Transport Dive (2020), 15 States, DC will collaborate on 100% electric truck sales by 2050 (available here)
[53] Office of Governor Gavin Newsom, Governor of California (2020), Governor Newsom Announces California Will Phase Out Gasoline-Powered Cars & Drastically Reduce Demand for Fossil Fuel in California's Fight Against Climate Change (available here)
[54] Mckinsey, March 2019 Expanding electric-vehicle adoption despite early growing pains, (available here)

2.2.5 Climate action on building standards

Joe Biden's plan will target of a reduction in the carbon footprint of the U.S. building stock of 50% by 2035 and direct the U.S. Department of Energy to accelerate the development of new efficiency standards for household appliances and equipment.

Joe Biden promises to upgrade **4 million buildings and weatherize 2 million homes over 4 years**, creating at **least 1 million jobs with the choice to join a union,** and spuring the building retrofit and efficient-appliance manufacturing supply chain by funding direct cash rebates and low-cost financing to upgrade and electrify home appliances and install efficient windows, which will potentially cut residential energy bills.

How much does it cost?

Although there are high renovation or mitigation costs, this measure can have a real beneficial effect on the utility bills of American businesses and citizens.

Building improvements have a real impact on household purchasing power, according to the EnergyStar program, the label that identifies top-performing smart building equipment would have saved American consumers and businesses $18 million in energy costs. According to the U.S. Department Of Energy, the average cost for weatherization per unit is $4,695. Biden expects to weatherize 2 million homes, making a total cost of $9.3 billion over 4 years.[55]

The State can play a role in this adaptation plan for buildings, as it owns 270,000 buildings in the country.

Domestic social impact:

The Department of Energy's Weatherization Assistance Program was launched to reduce energy costs for low-income families by improving the energy efficiency of their homes. The program has created more than 8,500 jobs and 35,000 homes have benefited from the program. According to the Department of Energy, households had saved $283 in annual energy costs, 18% of their heating bill and 7% of their electricity consumption through the weatherization improvements and upgrades.

For $1 invested in weatherization, $1.72 is generated in energy benefits and $2.78 in non-energy benefits. This can reduce costs for the most vulnerable communities and thus increase their disposable income with beneficial effects on economic activity. **For 2 million weatherized homes** (cost estimated to $9.3 billion over 4 years, see *supra*)**, the economic energy gain and the non-energy benefits generated will be respectively $16 bn and $26 bn for the U.S. economy.**

2.2.6 Back to a globally active nation on climate change diplomacy?

Not only does Joe Biden pledge to reengage in diplomatic agreements such as the Paris Agreement, he also proposes to embrace the Kigali Amendment to the Montreal Protocol. He intends to go further by **motivating all countries to ban fossil fuel subsidies and wants to position the U.S. as a ecological transition example**. Joe Biden also confirms his desire **to reform the International Monetary Fund and Regional Development Bank standards on debt repayment priorities for development projects**. He will prohibit U.S. public institutions (Overseas Private Investment Corporation (OPIC), the Export-Import Bank, and the new U.S. International Development Finance Corporation) to invest in international coal plants or high-carbon fossil energy projects. One expects a continuation of the trade war with China based on climate grievances as Joe Biden has made strong statements on the world's largest GHG emitter. For example, he would want China to stop subsidizing coal exports and outsourcing GHG emissions.

[55] U.S Department of Energy (2018) Weatherization Works Report (available here)

In the debt capital market, Joe Biden promises to meet America's climate finance pledge and provide "green debt relief" for developing countries that make climate commitments.

Joe Biden will also pursue a global moratorium on offshore drilling in the Arctic and reestablish climate change as a priority for the Arctic Council.

How much does it cost?

The reintegration of the U.S. into international environmental coalitions will require participation in international green funds such as the Green Climate Fund. The U.S. pledged to finance it by $3bn but after Donald Trump announced a drastic reduction, the U.S. have contributed only $1 billion. The international engagement of Joe Biden could increase the U.S. contribution over $3bn.

Moreover, Joe Biden wants the U.S. to lead other nations to establish rules that take into account unsustainable climate and debt costs in prioritizing who gets paid under international debt forbearance. Projects with high carbon impact and high debt costs will go to the end of the line, making them higher risk and more costly.

Environmental impacts:

- As the U.S. is the **second biggest GHG emitter** in absolute terms, the re-engagement of the country into international climate cooperation could upgrade the global long-term goals on climate change. Joe Biden's plan could reinvigorate the international environmental policy by promoting climate change research for example.
- Joe Biden engages to seek a **G20 commitment to end all export finance subsidies of high-carbon projects**, building on past commitments from the G7 and multilateral export finance institutions to eliminate financing for coal in all but the poorest countries.

2.2.7 Climate change adaptation plan & reinforcement of the Environmental Protection Agency

Joe Biden clearly addresses climate change adaptation related issues. In his "**Plan for Rural America**" he not only promised to tackle climate change mitigation questions by "*making American agriculture first in the world to achieve net-zero emissions"* by promoting renewable fuels and bio-based manufacturing, he also promised to give farmers new sources of income through an activity diversification support scheme, making them less vulnerable to climate change. His climate plan also focuses on **adaptation and resilience capacity of the Caribbean region** that is particularly vulnerable (sea levels, hurricanes, droughts). He also proposed to make **"*unprecedented investments*" to build "*resilient infrastructures***". On his campaign website, Joe Biden pledges: "*Every Federal dollar spent on rebuilding our infrastructure during the Biden Administration will be used to prevent, reduce, and withstand the impacts of this climate crisis*". The budget allocated to investments in infrastructure reaches $1.3 trillion but includes infrastructure that are not necessarily climate change resilient.

Under the Trump Administration, the Environmental Protection Agency has referred a low number of criminal anti-pollution cases to the Justice Department (see part 1.3). Joe Biden promises to direct EPA and the Justice Department to pursue anti-pollution cases to the "fullest extent" permitted by law and, when needed, "seek additional legislation as needed to hold corporate executives personally accountable – including jail time where merited".

All in all, the analysis of Joe Biden's program reveals **a strong desire to change the energy paradigm with relative concrete measures of deployment for infrastructure intended to decarbonize the economy**. However, Joe Biden does not clearly commit to certain key topics of the ecological transition such as meat production, coal mining, ICE Vehicles, carbon pricing trajectory or waste management.

2.3 What is absent from Joe Biden's green agenda?

2.3.1 No clear commitments on fossil fuel

Joe Biden's (conflicting) speech extracts on fracking & fossil fuels

- *"Would there be any place for fossil fuels, including coal and fracking, in a Biden administration?"*
  "No. We would work it out. We would make sure it's eliminated, and no more subsidies for either one of those, period."
  Joe Biden, July 2019, CNN's Democratic primary debate.
- *"I am not banning fracking. Let me say that again: I am not banning fracking. No matter how many times Donald Trump lies about me"*
  Joe Biden, August 2020, Pittsburgh.

The position of Joe Biden at first sight is balanced on fracking. An analysis of Joe Biden's program, advisors and speeches dismisses any scenario of radical transition where the U.S. fossil fuel sector is shrunk under regulatory assault. Joe Biden also lacks transparency on the fracking technique subject. Hydraulically fractured wells provide two-thirds of U.S. natural gas production[56] and half of current crude oil production[57]. However, during the process of extracting shale gas, not all the gas released from shale rock fromations is captured; there are fugitive emissions of methane. Even if there is no a clear consensus, a 2011 study by Cornell University[58] concluded that 3.6% to 7.9% of the methane from shale-gas production escapes to the atmosphere in venting and leaks over the lifetime of a well and these methane emissions are at least 30% more than and perhaps more than twice as great as those from conventional gas.

Biden promised to ban hydraulic fracking on public lands, around 25% of fossil fuels are produced on public lands. This measure is expected to curb the increase in sales of public land for gas and oil extraction under the Trump administration (multiplied by 6 in one year reaching 12 million acres sales for oil and gas production in 2018)[59].

Joe Biden takes into account the collateral damages of a transition. The Just Transition, an economic concept at the heart of the Green New Deal, proposed both the preservation of jobs in transition and the transition of the most carbon-intensive sectors (see part 1.3).**The Democratic Presidential nominee also promises to ban fossil fuel subsidies**. In the U.S., direct and indirect fossil fuels account for $649 bn in 2015. [60]

[56] U.S Energy Information Administration (2020), Hydraulically fractured wells provide two-thirds of U.S. natural gas production (available here)
[57] U.S Energy Information Administration (2020), Hydraulic fracturing accounts for about half of current U.S. crude oil production (available here)
58 Cornell University (2011), Methane and the greenhouse-gas footprint of natural gas from shale formations (available here)
[59] NY Times (2018), Fracking Booms on Public Lands (available here)
[60] IMF (2019), Global Fossil Fuel Subsidies Remain Large: An Update Based on Country-Level Estimates (available here)

Table 9: Focus on direct fossil fuel subsidies in U.S.

Direct subsidies	Description	Saving in next 10 years if eliminated
Intangible Drilling Costs Deduction (26 U.S. Code § 263. Active)	A cost deduction that allows companies to deduct a majority of the costs incurred from drilling new wells domestically.	**$13bn**
Percentage Depletion (26 U.S. Code § 613. Active)	An accounting method that works much like depreciation, allowing businesses to deduct a certain amount from their taxable income as a reflection of declining production from a reserve over time	**$12,9bn**
Credit for Clean Coal Investment Internal Revenue Code § 48A (Active) and 48B (Inactive)	A series of tax credits for energy investments, particularly for coal	**$1bn**
Nonconventional Fuels Tax Credit (Internal Revenue Code § 45. Inactive)	Tax credit was created by the Crude Oil Windfall Profit Tax Act of 1980 to promote domestic energy production and reduce dependence on foreign oil.	**$12,2bn**
	TOTAL	**~$39bn**

Source: Environmental and Energy Study Institute, 2019, base on President Trump's Fiscal Year 2017 Budget proposal

Joe Biden would require **aggressive methane pollution limits** for new and existing oil and gas operations. These two promises could have a slight impact on oil companies in the U.S. **Regarding the coal sector, Joe Biden does not give any information on a phasing out strategy**, but **he claims that he will increase coal companies' payments into the black lung benefits program**, and reform the black lung benefits system so it is no longer in favor of coal companies.

2.3.2 A vague support for the development of sustainable finance

Joe Biden does not clearly mention sustainable finance development in his political agenda, however he proposes three measures at the executive level that can be a push for the development of sustainable finance in the U.S.:

1. **Re-engage in multilateral agreements such as the Paris Agreement** could promote US discussion with Europe (TCFD, G20 Sustainable Finance Study Group, Green Taxonomy).
2. **The incorporation of ESG issues into financial analysis and investment** supported by Kamala Harris (see part 2.4.1) and by Elizabeth Warren as the opposite strategy of the Department of Labor which seems to be holding back the integration of ESG data into the management of American retirement savings[61].
3. **The standardization of the publication of ESG data with the proposal of ESG disclosure for companies** if the Democrats reach the majority in the Congress. This proposal has been supported by the Democrats' Climate Committee (see part 2.4.3) and by Elizabeth Warren[62]. The U.S. could then follow the example of the EU, which introduces an obligation for institutional investors to make available to their subscribers information on how they take into account criteria relating to compliance with social, environmental and governance objectives in their investment policies[63].

[61] Department of Labor (2020), U.S. Department of labor proposes new investment duties rule (available here)
[62] CNN Business (2020), Wall Street's nightmare: Elizabeth Warren as Treasury Secretary (available here)
[63] Green & Sustainable Hub (2020), EU Taxonomy for sustainable activities (available here)

2.4 The Democrats' shift towards environmental policies

2.4.1 Kamala Harris, The Vice President

On April 12th, 2020, Kamala Harris was named Joe Biden's vice-Presidential running mate. She is less climate-focused than other candidates of the 2020 Democratic nomination but **she has shaped her electoral platform on social justice and on the Green New Deal**. Her goal was to achieve 100% U.S. electricity from renewable sources.

In September 2018, Kamala Harris sponsored the Climate Risk Disclosure Act[64] which was proposed by Elizabeth Warren and aims at encouraging "*market forces to speed up the transition from fossil fuels to cleaner energy—reducing the odds of an environmental and financial disaster without spending a dime of taxpayer money*."[65] The proposal now awaits further action. In November 2018, Kamala Harris co-sponsored **a resolution specifying key findings of the Intergovernmental Panel on Climate Change report and National Climate Assessment** that stipulated the senators' support for bold climate action. In July 2019, Kamala Harris and Alexandria Ocasio–Cortez introduced the **Climate Equity Act**, a bill that would lay out steps for the Congress and the White House on how to go about guaranteeing policies that composed *"a future Green New Deal protect the health and economic wellbeing of all Americans for generations to come.*"

In August 2019, Kamala Harris signed a letter to Environmental Protection Agency ("EPA") Administrator, Andrew Wheeler, urging the EPA to ban chlorpyrifos, a toxic substance. In September 2019, she unveiled a $10 trillion climate change plan intended to move the U.S. to a 100% renewable energy-based power grid by 2030 in addition to transitioning all vehicles in America to the same energy sources by 2035. **She pledged to rejoin the Paris Agreement and put an end to U.S. support for international oil and natural gas extraction projects**.

In April 2020, in response to the proposed decision of the EPA to retain air quality standards from the Obama administration, Harris was one of 18 senators to sign a letter[66] standing against this decision.

Kamala Harris claimed she supported fracking ban. However, during her Presidential campaign, she did not sign the no-fossil-fuel-money pledge agreeing not to take any donations from fossil fuel companies or lobby groups.

According to the League of Conservation Voters (LCV), Kamala Harris has a lifetime voting record of 91% pro-environmentalism[67]. Joe Biden has a lifetime score of 83%.

[64] U.S Congress, Climate Risk Disclosure Act: A bill to amend the Securities Exchange Act of 1934 to require issuers to disclose certain activities relating to climate change, and for other purposes

[65] The law will require the publication of information related to environmental risks for public enterprises such as: direct and indirect emission of gas to corporate enforcement, their measurement of climate risk in their financial analysis whether physical or transitions.

[66] U.S. official letter (2020) (available here)

[67] League of Conservation Voters (2020), Kamala Harris scorecard (available here)

2.4.2 The draft of the Democratic Party's agenda

Joe Biden will have to rely on the U.S. Congress to achieve his goals. In recent months, the Democrats have shown growing interest in climate issues and two major documents were published, in addition to the Green New Deal (see annex 14).

The Democratic Party's draft policy agenda published in July 2020 is a symbolic document that broadly outlines the party's agenda.

Table 10: Top 10 of the Democratic Party's draft proposals

Draft proposals	Draft Level of information/commitment
1. Rejoin the Paris Climate Agreement on day one, putting the U.S. in the position of global leadership	No date or precision on the nationally determined contribution given
2. Recommit to the Green Climate Fund	No date or amount specified
3. Eliminate carbon emission from power plants by 2035 through technology-neutral standards for clean energy and energy efficiency: including hydroelectric power, geothermal, existing and advanced nuclear, and carbon capture and storage	Figures and deadline provided; no breakdown between the levers or share of Carbon capture, utilisation and storage specified
4. Install 500 million solar panels, including eight million solar roofs and community solar energy systems, and 60,000 wind turbines within 5 years	Figures and deadline provided; no target in GW not defined or calculation methodology provided
5. Support 2 million low-income households and affordable and public housing units within five years for energy-saving	Figures and deadline provided; no calculation methodology provided
6. Achieve net-zero greenhouse gas emissions for all new buildings by 2030, on the pathway to creating a 100 % clean building sector	Deadline provided; no standards provided or route plan
7. Renew the entire fleet of 500,000 school buses to American-made, zero-emission alternatives within five years	Figures and deadlines provided; no calculation methodology specified
8. Transition the 3 million vehicles in the Federal, State, and local fleets to zero-emission vehicles	Figures provided; no deadline or calculation specified
9. Install at least 500,000 public charging stations from coast to coast by partnering with State and local governments	Figures provided; no deadline (increase by seven times the current number of charging stations)
10. Apply a carbon adjustment fee at the border to products from countries that fail to live up to their commitments under the Paris Climate Agreement	Sensitive subject similar to EU Carbon tax adjustment

Source: The Democratic Party's draft policy agenda published in July 2020 & Authors Natixis GSH (2020)

This draft backs aggressive climate change proposals including decarbonizing the electricity sector by 2035 and achieving net-zero new buildings by 2030. Nonetheless, there are still unclear areas, such as the ban on fracking. The budgetary costs and technicalities of such proposals are not disclosed.

2.4.3 The report of the Special Committee on Climate Change

The Democratic Party has formed a **Special Committee on the Climate Crisis ("SCCC")**, which issued its report: The Case for Climate Action, on August 25, 2020. This comprehensive report focuses on **15 areas to create a clean economy for the American people**. Under each area, the report identifies barriers, opportunities and recommendations for achieving a clean economy.

Table 11: Main recommendations made by the Special Committee on the Climate Crisis

Electric Sector	• **A Federal clean energy standard, emission standards, a carbon price,** and/or other market mechanisms to ensure the rapid adoption and scale-up of proven technologies today • Predictable, technology-neutral tax incentives focused on emission reductions, to enable long-term investment planning
Industrial Sector	• Implementing **Federal emission standards for the industrial sector**, coupled with policies that protect American manufacturers from unfair competition from goods that are produced in an environmentally damaging manner elsewhere.
Transportation	• Establishing a **national Zero Emission Vehicles (ZEV) standard,** increasing access to ZEVs through incentives, and investing in ZEV infrastructure • Incentivizing electrification of shipping and rail, and building out U.S. high-speed rail • Increasing Federal grant programs and direct investment to make public vehicle fleets and school buses zero emission
Financial and Economic Risks	• **The Securities and Exchange Commission (SEC) should issue updated rules on how public companies must disclose climate risks and take enforcement actions against companies that fail to do so** & the SEC should require rating agencies to incorporate climate financial risk into their core rating methodologies. • The **Federal Reserve and other agencies** should take the lead in developing climate scenario analysis tools and conduct stress tests on individual financial firms to measure their resilience to climate risks
Environmental Justices Priorities	• **Fund a national Green Bank to provide financing options and direct grants for clean energy and climate resilience projects**. • Increase EPA enforcement of all rules and regulations, especially those governing industrial facility pollutions into surrounding EJ communities.
International Engagement	• Reengaging in international agreements to reduce global emissions, including the Kigali Amendment.[68] • Working with international organizations to reduce emissions from aviation and shipping. • Integrating climate change into key agency decision-making on matters related to foreign policy, national security, and humanitarian assistance
Farmer and rural communities	• Expand existing US Department of Agriculture agricultural conservation programs and include improved soil health and soil carbon storage incentives. • Facilitate participation in carbon markets by supporting research and development of accurate, low-cost, readily scalable methods to measure soil carbon

Source: Democratic Party, Special Committee on the Climate Crisis (2020)

The Special Committee on the Climate Crisis ("SCCC") specifically returns to the role to be played by finance in the ecological transition by proposing the creation of a national bank for financing options and direct grants for clean energy and climate resilience projects. It reminds the major role of regulatory authorities in the implementation of a transparent and homogeneous market, particularly with the obligation for companies to disclose carbon emissions**. This proposal is also reminiscent of the work carried out within the European Union** with the EU taxonomy[69] and Article 173-VI of the French Energy Transition Law for Green Growth, which set a global precedent by obliging investors to be transparent about the impact of their investments on climate change.

The Democratic Party's 2020 draft policy agenda and the proposals of the SCCC underline the Democrats' increasing awareness towards environmental policies. **There is consensus among the Democrats in the fight against climate change.** The final objectives and recommendations of the drafts are aligned with Joe Biden's environmental agenda.

[68] In 2016, the Montreal Protocol on Substances that Deplete the Ozone Layer (Montreal Protocol) was signed by countries that committed to a gradual reduction of consumption and production of hydrofluorocarbons (HFCs).The Kigali Amendment (entered into force January 1, 2019) is projected to avoid 0.44°C (0.8°F) of global warming by 2100. It has been hailed as one of the most significant steps to fight global warming.

[69] See our publication about the EU taxonomy (September 2020) (available here)

3. Warming nation, urgent climate action

3.1 A slight emission decline in the U.S., which remains the largest emitter

The United States of America (the "U.S.") is the second largest absolute polluter worldwide. It accounts for almost 15% of global emissions, following China (27%). In 2018, total gross U.S. greenhouse gas ("GHG") emissions reached 6.7 billion metric tons of carbon dioxide equivalent[70].

They have increased by 3.7% from 1990 to 2018.[71] **The U.S. GHG emissions intensity per capita is twice the G20 average[72] and four times the global average** (see table 12 and annexes 1 & 2).

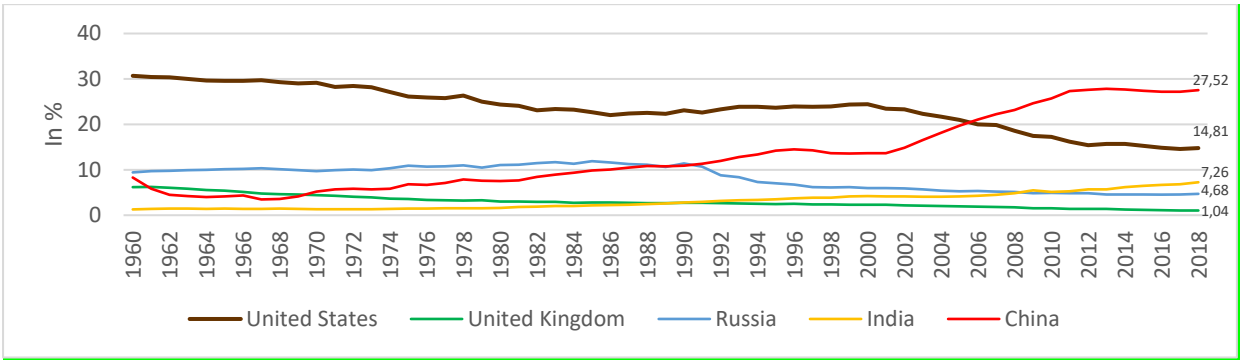
Table 12: Indicators of the U.S. compared to the world average data

	United States	World average
Population *(2019)*	328,200,000	7,577,130,400
GDP (2019**)**	21,345,000,000,000	87,265,226,000,000
GDP per capita	65,295.6 USD	11,516.9 USD
GHG emission per capita *(excl. LULUCF)* **(**2017**)**	19.97 t	4.79 t

Source: Climate Change Performance Index (2020) & Our World in Data (2019)

Absolute and cumulative U.S. emissions have slightly declined over the past few years with net economy-wide GHG emissions falling by 2.1% in the U.S. in 2019[73]. **Meeting the Paris Agreement targets requires a between 2.8 and 3.2% average annual reduction in emissions over the next six years**. As a reminder, the U.S. has emitted more than a quarter of CO_2 (twice as much as China) since 1751 and is thus the largest historical CO_2 emitter globally. The slight decline (see annex 3) is also illustrated by the decreasing share in annual global CO_2 emissions of the U.S. In 2005, the trend reversed and China has exceeded the U.S.' share in annual global CO_2 emissions (see figure 1).

Figure 1:Share of annual global CO2 emissions



Source: Our World in Data, based on Global Carbon Project (2018)

[70] Land use, land-use change, and forestry (LULUCF) are excluded.
[71] U.S Environmental Protection Agency (2020), "Inventory of US GHG emissions and sinks", available here.
[72] 19.97 tCO2e/capita for the U.S against 7.5tCO2e/capita for the G20 average
[73] In 2019, U.S. emissions totaled 5,783 million metric tons of CO_2 equivalent

Despite these recent emissions declines, several sectors such as power generation, transportation and industrials are material GHG emittors despite the increasing use of renewable energy. The transportation sector generates the largest share of GHG emissions with 28.2% in 2018. Light-duty vehicles (including passenger cars and light-duty trucks) contribute by far to the largest share of emissions within the U.S. transport sector, with 59% in 2018 (see annexes 4 & 5). Between 1990 and 2018, GHG emissions in the transportation sector increased more in absolute terms than any other sector[74].

Electricity generation, **which accounts for 26.9 % of emissions in 2018,** represents the second highest sector in terms of GHG emissions' share and remains **heavily dependent on fossil fuels, with more than 2/3 of the energy mix for electricity generation** (see table 13). **In 2019, natural gas, including shale gas, was the largest energy source, with about 38%, followed by coal with about 23%.** Nonetheless, **coal remains the dominant CO_2 emissions source related to electricity generation. Within the power sector,** coal, which only represents 23.5% of the share of total energy used, accounts for 60% of the CO2 emissions. In comparison, natural gas accounts only for 38% and represent almost 40% of the total energy used.

Table 13: U.S. utility-scale electricity generation by source, amount, and share of total in 2019

Energy source	Billion kWh	Share of total electricity generation	Share of total CO2 emissions related to electricity generation
Total fossil fuels	**2 580**	**62.7%**	
Natural Gas	1 582	38.4%	**38%**
Coal	966	23.5%	**60%**
Petroleum (liquids & coke)	19	0.5%	**2%**
Other gases	14	0.3%	
Nuclear	**809**	**19.7%**	
Total renewables	**720**	**17.5%**	
Hydropower	274	6.6%	
Wind	300	7.3%	
Biomass	58	1.4%	
Solar	72	1.8%	
Geothermal	16	0.4%	
Total others	**8**	**0.1%**	
Pumped storage hydropower	-5	-0.1%	
Other sources	13	0.2%	

Source: U.S. EIA (August 2020)

The COVID-19 crisis has severely impacted the energy sector, mechanically impacting its carbon footprint. The **EIA forecasts that U.S. energy-related CO2 emissions, will decrease by 10.0% (512 million metric tons) in 2020,** resulting from the decline in energy consumption related to COVID-19 mitigation efforts**.** In 2021, EIA forecasts that energy-related CO2 emissions will increase by 4.8% as the economy recovers and energy use increases[75] (see annex 6).

The physical consequences of climate change are significant. **The U.S. has undergone 279 major weather and climate disasters from 1980 to 2020 at a total cost in excess of $1.825 trillion**[76]. **In 2019, several climate disasters hit the U.S. and in total, 14 disasters that have caused at least $1 billion dollars damage costs for each of them[77].**

[74] EIA, "Monthly Energy Review", available here.
[75] U.S EIA (Sept. 2019), "Short-term energy outlook", available here.
[76] The U.S National Centers for Environmental Information (NCEI) is the nation's largest active archive of environmental data, under the jurisdiction of the U.S government
[77] It includes 3 major inland floods, 8 severe storms, 2 tropical cyclones (Dorian and Imelda), and 1 wildfire event

Several sectors are impacted by climate change-related disasters, especially the regions dominated by **agriculture and fishery activities** or **tourism**. According to the EPA, each year, the crops, livestock, and seafood produced in the U.S. contribute more than $300 billion to the economy. **The sea level rise and storm surge are affecting U.S. energy sector**, jeopardizing its infrastructures located in coastal areas[78].

3.2 A strong presence of fossil fuels despite renewable energies uptake

Since 2006, the shale revolution has changed the energy mix of the U.S. (see annex 7) **and fossil fuels (oil, coal and gas) still make up 82% of the U.S. energy supply.** Coal has lost market share to natural gas, especially to shale gas**.** This is explained by low gas prices driven by the fracking boom that had led to a decline of 50% in 2007, to 28% in 2018, and is expected to reach 21% in 2024[79].

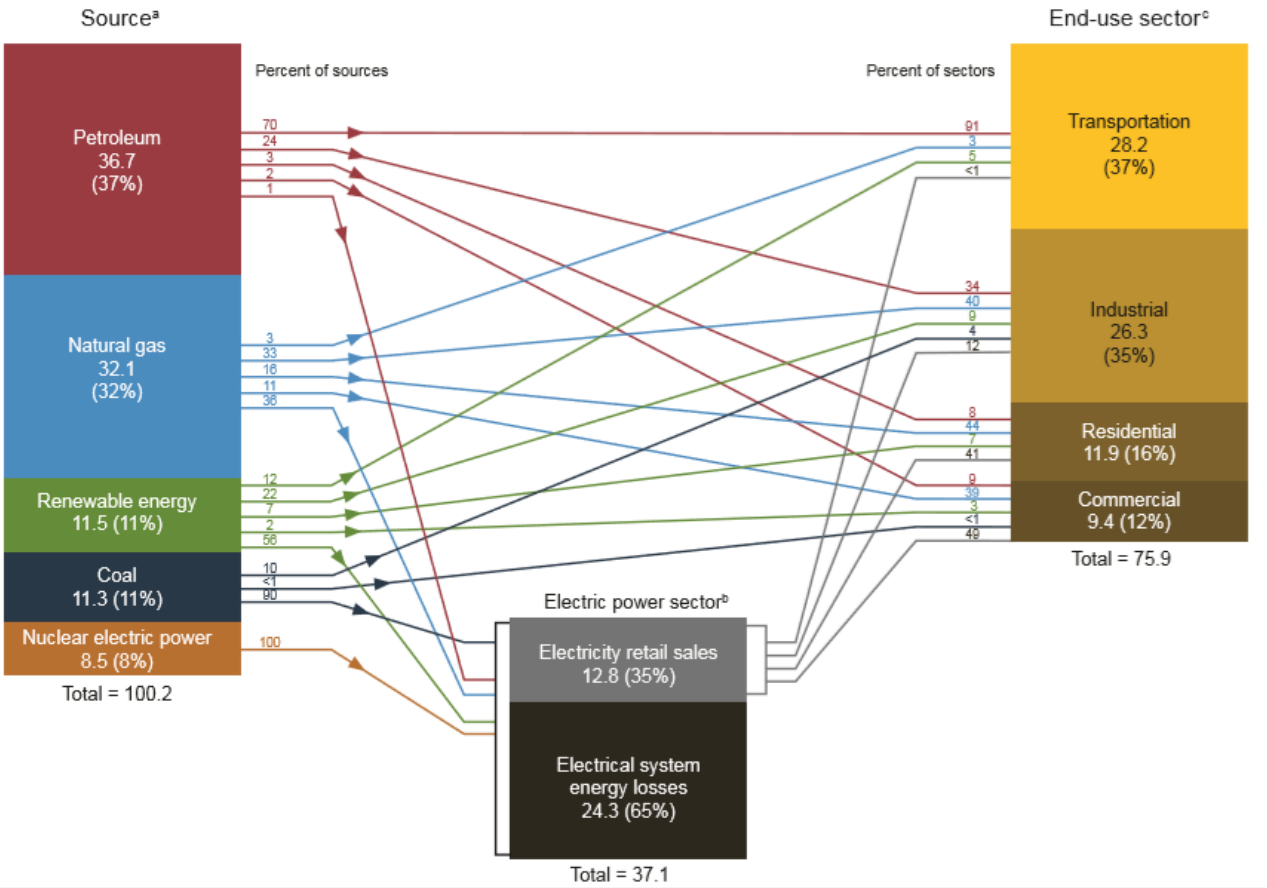
However, over the past five years, the share of these renewable resources in the energy supply mix has increased by around 18% in the U.S. In 2019, the U.S. renewable energy consumption even surpassed coal, with 11.5 Btu renewable energy and 11.3 quadrillion Btu from coal[80] (see annex 8). Compared with 2018, coal consumption in the U.S. decreased by almost 15%, and total renewable energy consumption grew by 1%.

Despite a tripling of renewable energy in U.S. total energy supply from 2000 to 2019, the nation still lags behind compared to the rest of the world. Over the past five years, the share of solar, wind, geothermal and biomass in total energy supply has increased by around 18%, which is much less than the G20 average (+29% within the period 2013-2018)[81]. Compared to the rest of the world, the share of renewable energy represents 7.6% of the Primary Energy Supply in the U.S. in 2017, compared to a worldwide average of 13.9%.

The figure below summarizes the U.S. energy consumption by sources and sectors in 2019. **Petroleum is the most used source of energy (37%, representing 36.7 quadrillion British thermal unit), followed closely by natural gas (32%). 70% of the petroleum is used for the transportation sector. Natural gas has two main uses: industrial (33% of the total use of gas) and electric power sector (36%).**

[78] Several thousand of oil drilling platforms offshore are on the Gulf Coast or in the Gulf of Mexico. For example, Hurricanes Katrina and Rita damaged more than 100 platforms and damaged 558 pipelines in 2005 according to the U.S Global Change Research Program (USGCRP).
[79] EIA (2019), "Coal 2019", available here.
[80] EIA (2020), "Monthly Review"
[81] Climate Transparency (2019), "Brown to Green, the G20 transition towards a net-zero emissions economy", available here

Figure 2: U.S. energy consumption by source and sector, 2019 (in quadrillion Btu)

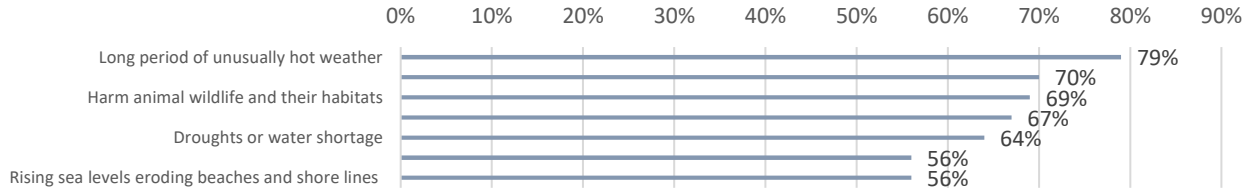


Source: EIA, Monthly Energy Review, April 2020

3.3 Public opinion is shifting

The share of American citizens who believe that "global climate change is a major threat to the well-being of the U.S." has grown from 44% in 2009 to 60% in 2020 and two thirds of the U.S. population believe that the "federal government is not doing enough to reduce the effects of climate change"[82]. In addition, **62% of U.S. adults say that climate change is affecting their local community. Among this 62% of U.S. citizens,** the graph below shows how climate change is currently affecting their local community and the percentage associated.

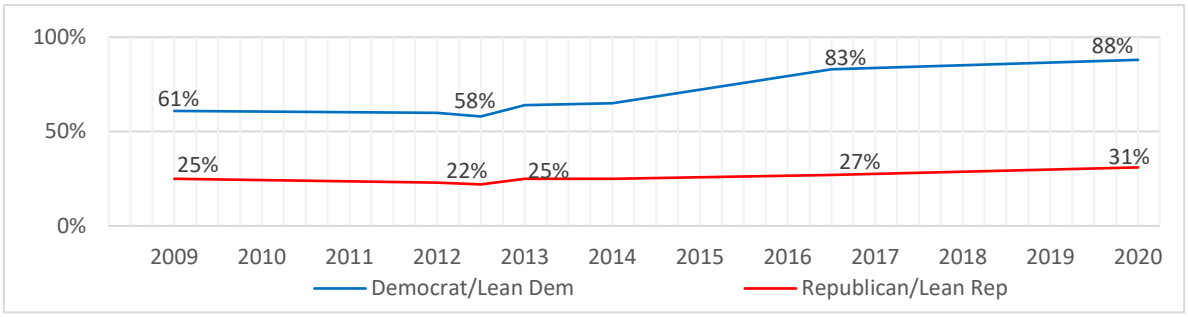
Figure 3: Polls showing how climate change is affecting local communities



Source: Pew Research Center (April 2020)

Partisanship is a strong factor in beliefs about climate change and concerns from Democrat voters are significantly increasing while the opinion of Republican voters remains largely unchanged.

Figure 4: Percentage of adults who say "global climate change is a major threat to the well-being of the U.S".



Source: Pew Research Center (April 2020)

[82] Pew Research Center (April 2020), "How Americans see climate change", available here.

CONCLUSION

Climate change action is a point of divergence between the two candidates, and their respective agendas will affect the U.S. emissions backdrop. Nevertheless, there is some convergence between the two candidates, for instance regarding the **trade war with China** that could affect the U.S. emissions. GHG emissions embedded in U.S. imports of goods are slightly on the rise and reshoring some industries could reduce these emissions[83]. Joe Biden may keep Trump administration tariffs in place if elected. He might use carbon-based tariffs to penalize countries failing to meet climate goals as suggested in his plan "Made in All of America".

Incumbent President Donald Trump would certainly stick to his climate-skeptic and environmental deregulation agenda (further shrinking the EPA for instance)**.** By contrast, Joe Biden has an aggressive climate agenda **although its feasibility can legitimately be questioned given the unspecificity of some targets** (in dollar, in absolute or in intensity terms) **and the lack of intermediate steps and measures to achieve them.** At this stage, both the environmental and economic impacts of his proposals remain hard to assess.

If a handful of highly emitting sectors are considered in Joe Biden's agenda, such as electricity generation or transportation sectors, uncertainty remains on several aspects. He does not provide details on his funding plan (carbon tax mentioned but without price level guidance, no reference to green bond issuances from the federal government). A coal ban or phase out plans are absent, offsetting and sequestration of carbon comes without figures nor timeline.

There are structural trends in the U.S. — increasing citizens' concerns on climate change, improved competitiveness of renewable energies, States' transition policies suffering from climate change physical consequences, international pressure — **that pressure both candidates to address the climate topic.**

However, other trends, namely the sheer weight of shale gas and oil in the energy mix of the U.S. **cap the change of pace.** No matter the outcome of the elections**, the U.S., which became the largest producer of natural gas in 2011 and the world's largest producer of petroleum in 2018, is likely to keep increasing its oil and gas production** in years to come[84]**.** While European O&G companies, such as BP or Total, have engaged in aggressive transition strategies[85], U.S. majors like Exxon Mobil and Chevron have not jumped on the bandwagon as of yet.

Nonetheless, **U.S. companies might be affected by the an election outcome that could accelerate the transition plans of the companies to align with national climate targets.** For instance, several companies in the electricity generation sector, which have already set corporate-level targets, may need to strengthen them if Joe Biden is elected.

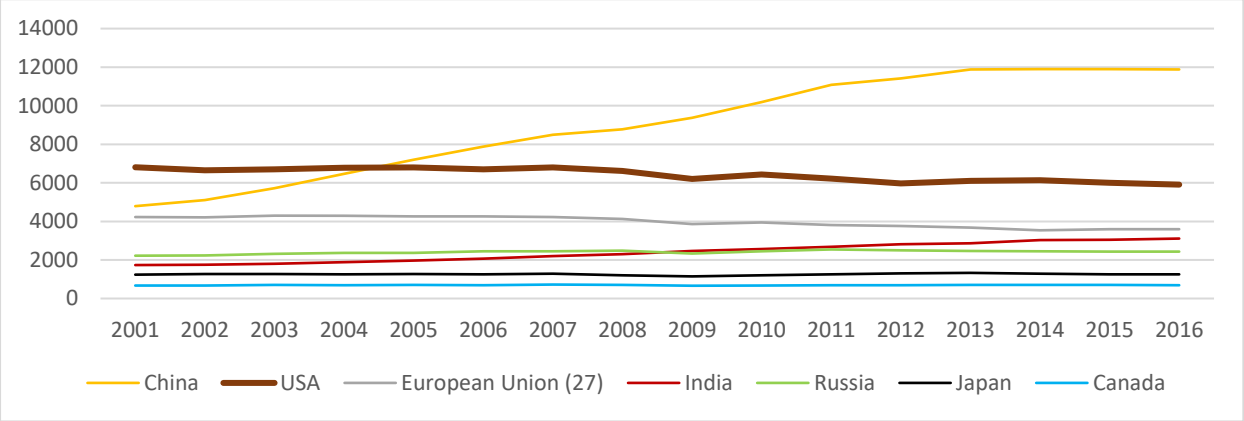
[83] The CO2 embedded in trade measures the emissions exported or imported as the percentages of domestic production emissions. In 2017, the U.S. imported emissions were equivalent to 7.89% of its domestic emissions; whereas China has a negative value of 13.11% meaning that China produces more goods will be exported than consumed domestically, according to the Global Carbon Project. (see annex 13).
[84] The U.S. produces a large share of the petroleum it consumes. In 2019, 94% of the petroleum consumption come from domestic production. EIA (2020), "Oil & Petroleum products explained", available here.
[85] See our newsletter's article "BP intensifies its transition efforts amid asset value and oil demand forecast revisions" here.

SOURCES

Various sources were used to diversify the analysis. A number of resources are in an Appendix separate document. The quantitative data were primarily extracted from U.S. official databases, the U.S. Environmental Protection Agency, the U.S. Energy Information Administration and from the U.S. Departments. We used the archives from the U.S. Congress and we selected information from intergovernmental reports and from newspapers' articles. We quoted studies from independent research entities and think tank specialized in environmental issues (Green Peace, Climate Action Tracker, Climate Change Performance Index, Climate Transparency) and public and private researches (McKinsey, Harvard, etc.).

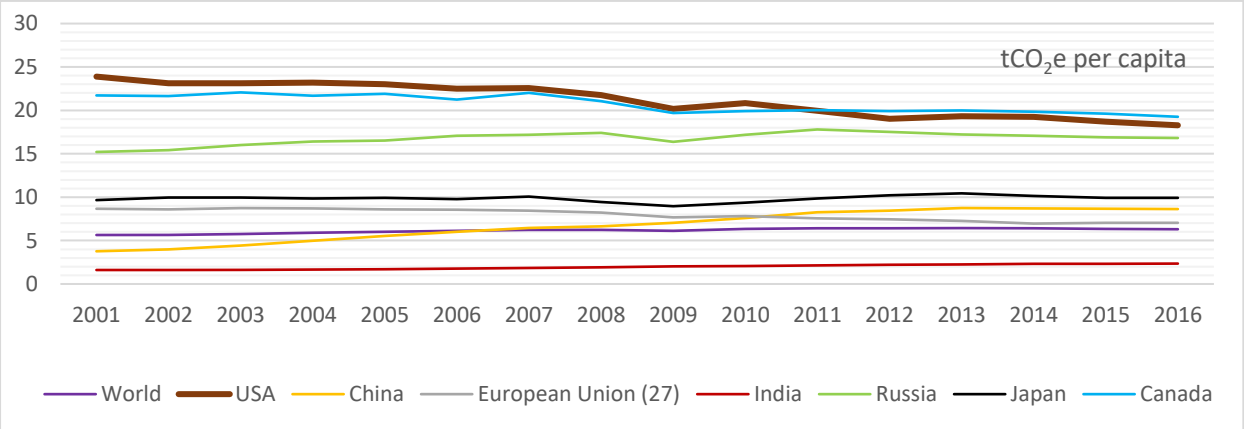
ANNEXES

Annex 1: GHG emissions (excl. LULUCF) from 2001 to 2016



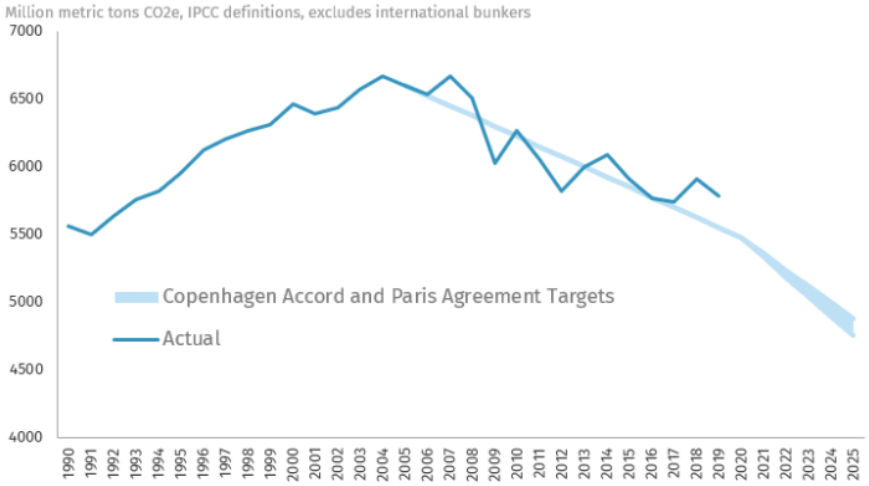
Source: Climate Watch Data (2020)

Annex 2: GHG emissions par capita (excl. LULUCF) from 2001 to 2016



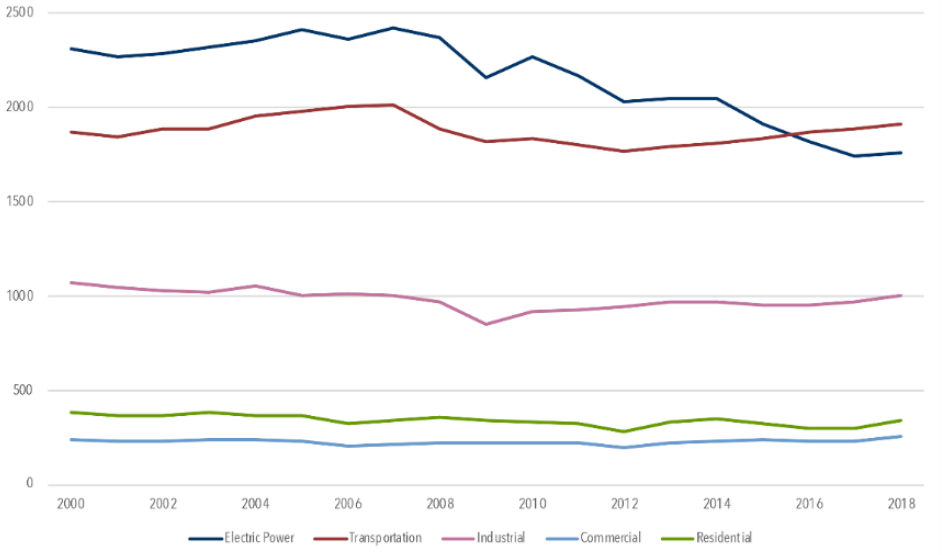
Source: Climate Watch Data (2020)

Annex 3: U.S. net GHG emissions from 1990 to 2020



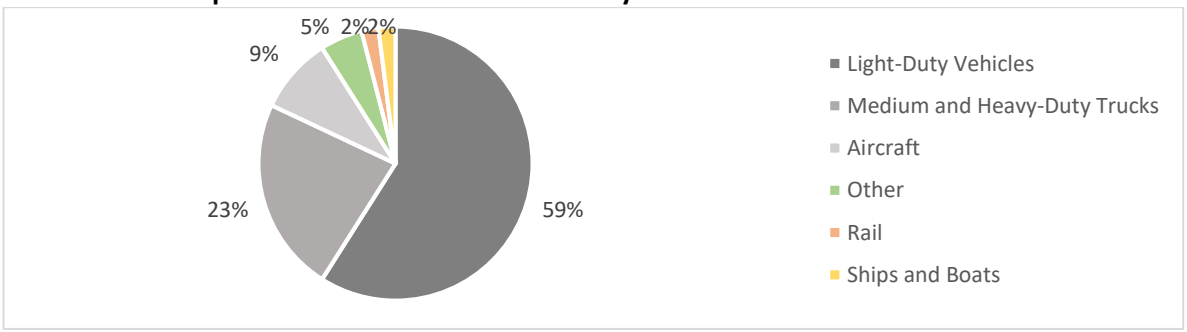
Source: Rhodium Group (2020), Preliminary US Emissions estimates for 2019

Annex 4: U.S. energy-related CO2 emissions by economic sector from 2000 to 2018 in Million Metric Tons



Source: EPA Energy Review (2019)

Annex 5: U.S. transportation sector GHG emissions by source in 2018



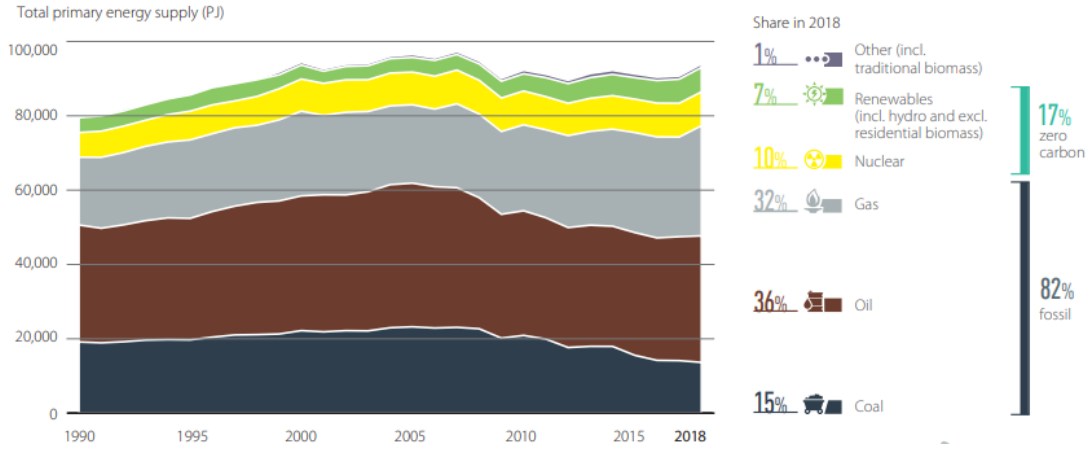
Source: U.S EPA (2020), US Transportation Sector GHG Emissions;

Annex 6: Focus on short term effects of the COVID-19 crisis on the energy sector

Natural gas consumption is expected to decrease globally in 2020, mainly because of a lower consumption in industrial sectors. Milder weather also pushed down natural gas demand. Following International Energy Agency (IEA) estimations[1], **data covering half of global demand suggest that gas consumption fell by more than 3% in the first quarter of 2020**, but the IEA estimates that **global natural gas demand could decrease by 5% in 2020. The response to the Covid-19 outbreak has also curtailed electricity use and industrial production, pushing down global coal consumption. With coal use declining in almost every sector, the IEA expects global coal demand to fall by about 8% in 2020. Therefore, the U.S, which produces approximately 9% of global coal, would probably undergo a decline in coal production. The energy source that was the most resilient to the sanitary crisis is renewable energy. It is even estimated that total global use of renewable energy will rise by about 1% in 2020. Even with supply chain disruptions due to the crisis, the expansions of solar, wind and hydropower sectors are expected to spark a 5% rise of renewable electricity in 2020.**

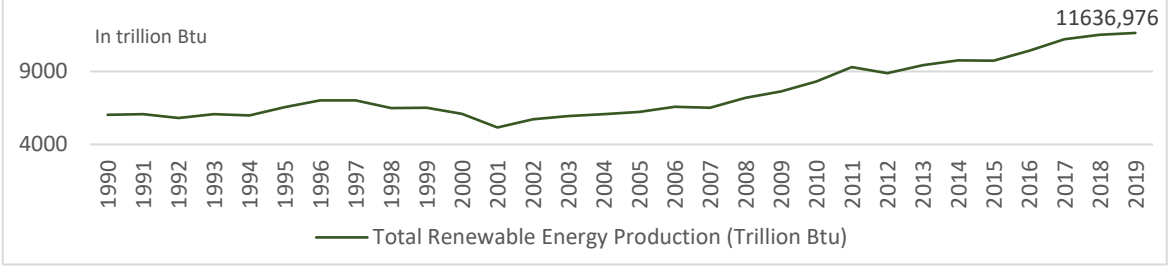
In the US, CO2 emissions declined with reduced consumption of all fossil fuels, particularly coal (24.9%) and petroleum (11.6%). It is forecasted, by the U.S **Energy Information Administration (EIA) that the electricity consumption will be reduced by 3.6% in the United States in 2020, compared with 2019. In the aftermath of the COVID-19 crisis, the EIA has published in August 2020 a** special report **focusing on the Short-Term Energy Outlook in the US. It forecasts that the share of U.S. electric power sector generation from natural gas-fired power plants will increase from 37% in 2019 to 40% in 2021. The** U.S **coal consumption should decrease by 26% in 2020 and U.S coal production in 2020 will decrease by 29% from 2019 levels according to this report. Furthermore, in line with global trend, the use of U.S renewable energy is expected to be the fastest-growing source of electricity. More specifically, the electric power sector should add 23.2 gigawatts (GW) of new wind capacity and 12.9 GW of utility-scale solar capacity in 2020.**

Annex 7: Energy mix in the U.S, from 1990 to 2018



Source: Climate Transparency, "Brown to green", 2019

Annex 8: U.S. Renewable Energy Production by year from 1990 to 2019

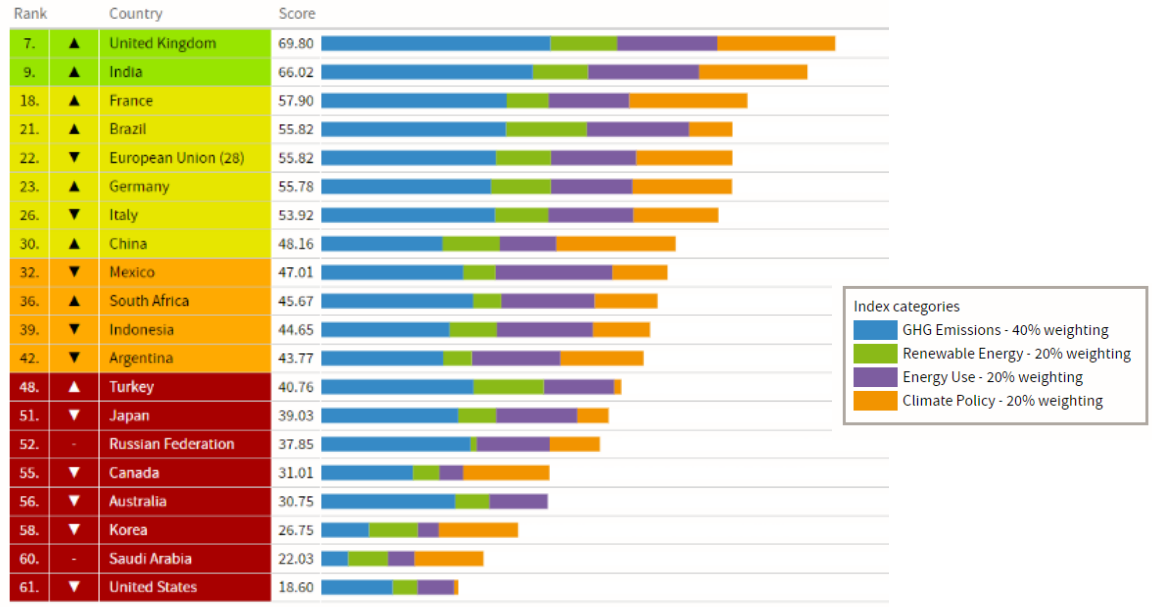


Source: Energy Information Administration (2020)

Annex 9: Details about Donald Trump's policies rollbacks

<table>
<tr><th colspan="2">Empowering Oil and Natural Gas sectors</th></tr>
<tr><td>Easing methane limits</td><td>In August 2019, the administration proposed rolling back limits on methane emissions regarding oil and gas operations implemented during the Obama administration. The Trump EPA also proposed to eliminate existing standards requiring oil and gas companies to monitor and repair leaks of methane from both new and existing equipment.
This could initiate the repealing of regulations limiting methane emissions from new oil and gas drilling, transport and storage operations. Several measures have been taken so far:
Postpone due date for state plans to limit methane emissions from landfills and postpones compliance deadlines (Emission Guidelines and Compliance Times for Municipal Solid Waste Landfills (U.S. Environmental Protection Agency, 2019b)
Cancel requirements for oil and gas companies to report methane emissions.
Reversed regulation that was designed to limit methane waste from oil & gas production on public lands (Methane Waste Prevention Rule (U.S. Bureau of Land Management, 2018)</td></tr>
<tr><td>Offshore drilling</td><td>In 2017, the Trump administration ordered a reversal of an Obama ban on oil and gas drilling in the Arctic and Atlantic oceans. In 2018, it outlined a proposal to open up the Atlantic, Pacific and new parts of the Arctic oceans to offshore drilling. After the plan announcement, several states passed legislation or amendments to restrict offshore drilling. Offshore drilling add additional oil spills risks as well as more fossil fuel burning, increasing GHG emissions.</td></tr>
<tr><td>Pipeline permitting</td><td>In early 2019, Trump issued executive orders limiting the ability of states to block interstate energy projects, including pipelines, under a provision of the U.S. Clean Water Act. The administration called for a review of rules requiring state certifications for federally approved interstate pipelines and project.</td></tr>
<tr><th colspan="2">Standards for Clean Cars and Emissions Standards for Cars and Trucks</th></tr>
<tr><td colspan="2">The Safer Affordable Fuel Efficient (SAFE) Vehicles Rule rolls back fuel economy and greenhouse gas emission standards for new cars and light duty trucks in model years 2021 through 2026. This regulation will increase the standard by 1.5% annually. The emission standard corresponds to approximatively 123,653 grams of CO2 per kilometer. In comparison for the same type of vehicles, the EU emission target for new cars will be 95 g CO2/km from 2021.
Those standards were projected to save roughly 4 billion barrels of oil and cut carbon dioxide emissions by two billon metric tons while saving consumers more than USD 1.7 trillion in fuel costs.
In addition, Trump's Administration also rolled back on the Obama's reforms on Corporate Average Fuel Economy Standards (CAFE Standards). These standards were enacted in 1975 in order to regulate automobile fuel emissions and to improve the average fuel economy of cars and light trucks. Obama proposed a plan, in 2010 raising the CAFE standards to a target of 54.5 miles per gallon for new vehicles by 2025. While not yet finalized, President Donald Trump proposed to hold the previous CAFE standard (37 miles per gallon) until 2026.</td></tr>
</table>

Annex 10: CCPI 2020 ranking for G20 countries



Source: CCPI (2020)

Annex 11: Extract from the "FY 2021 EPA budget in Brief" Categorical Program Grants in thousands US $

NPM / Grant	FY 2019 Actuals	Estimated FY 2020 Enacted	FY 2021 Pres Bud	Delta FY 2021 PB- Est FY 2020 Enacted	% Change FY 2020 PB - FY 2019 ACR
Air & Radiation					
State and Local Air Quality Management	$218,599	$228,219	$151,961	($76,258)	-33.4%
Tribal Air Quality Management	$12,461	$12,829	$8,963	($3,866)	-30.1%
Radon	$7,450	$7,789	$0	($7,789)	-100.0%
	$238,510	**$248,837**	**$160,924**	**($87,913)**	**-35.3%**
Water					
Pollution Control (Sec. 106)	$224,097	$223,289	$153,683	($69,606)	-31.2%
Beaches Protection	$8,949	$9,238	$0	($9,238)	-100.0%
Nonpoint Source (Sec. 319)	$166,310	$172,348	$0	($172,348)	-100.0%
Wetlands Program Development	$12,773	$14,183	$9,762	($4,421)	-31.2%
Nutrients & Harmful Algal Blooms	$0	$0	$15,000	$15,000	N/A
	$412,129	**$419,058**	**$178,445**	**($240,613)**	**-57.4%**
Drinking Water					
Public Water System Supervision (PWSS)	$96,650	$106,250	$67,892	($38,358)	-36.1%
Underground Injection Control (UIC)	$9,681	$10,164	$6,995	($3,169)	-31.2%
	$106,330	**$116,414**	**$74,887**	**($41,527)**	**-35.7%**
Hazardous Waste					
Hazardous Waste Financial Assistance	$101,277	$96,446	$66,381	($30,065)	-31.2%
Brownfields	$49,044	$46,190	$31,791	($14,399)	-31.2%
Underground Storage Tanks	$1,590	$1,449	$0	($1,449)	-100.0%
	$151,911	**$144,085**	**$98,172**	**($45,913)**	**-31.9%**
Pesticides & Toxics					
Pesticides Program Implementation	$12,420	$12,287	$8,457	($3,830)	-31.2%
Lead	$13,214	$14,049	$10,000	($4,049)	-28.8%
Toxics Substances Compliance	$4,561	$4,759	$3,276	($1,483)	-31.2%
Pesticides Enforcement	$17,434	$24,000	$10,531	($13,469)	-56.1%
	$47,629	**$55,095**	**$32,264**	**($22,831)**	**-41.4%**
Multimedia					
Environmental Information	$9,620	$9,332	$6,422	($2,910)	-31.2%
Multipurpose Grants	$0	$13,000	$10,000	($3,000)	-23.1%
Pollution Prevention	$5,545	$4,610	$0	($4,610)	-100.0%
Tribal General Assistance Program	$66,999	$65,476	$44,233	($21,243)	-32.4%
	$82,163	**$92,418**	**$60,655**	**($31,763)**	**-34.4%**
Total Categorical Grants	**$1,038,671**	**$1,075,907**	**$605,347**	**($470,560)**	**-43.7%**

Source: Fiscal year 2021, EPA Budget in Brie

Annex 12: Factsheets of California & New York States

CALIFORNIA

*California established its climate leadership in the U.S, becoming the first State to adopt an economy-wide **cap-and-trade program.***
The state is one of the co-founder state of the Climate Alliance.
The face-off between California and the federal government is illustrated by California's ability to maintain its own relatively rigorous environmental laws and regulations as the Trump administration loosens environmental provisions at the federal level.

State Data	Objectives & targets	Major policies & regulations
(2019) **Population** 39,512,223 **Income per capita** (2018) 73,815 **Unemployment rate** 4.0% **Major source of GHG emissions** Transportation 40%	In 2005, California set a target to reduce GHG emissions 80% below 1990 levels by 2050. In 2006, the state enacted a statutory target to reduce GHG emissions to 1990 levels by 2020. In 2016, it set a statutory target to reduce GHG emissions 40% below 1990 levels by 2030. In 2018, the State has a target of reaching net zero carbon dioxide emissions by 2045.	**Cap & Trade Program** ▪ The Cap & Trade program, the first multi-sector cap & trade program in North America, covers the state economy. The GHG emissions cap set will decrease about 3%. After that, the cap will be further reduced to help achieving an additional 40% reduction in state emissions by 2030. [86] **Climat Framework** ▪ The California Global Warming Solutions Act (2006): clarifies the role of the Cap-and-Trade Program **Power Generation** ▪ The 100 Percent Clean Energy Act (2018): sets the goal of reaching 100% fossil-fuel free electricity by the 2045. ▪ The California Solar Initiative & the Electric Power Generation Program Investment Charge: support the goal of 100% zero-carbon resources for retail electricity sales by 2045 **Transportation** ▪ The Zero-emission Vehicles Action Plan (2018): sets the goal of 5 million ZEVs by 2030 & development of infrastructures for ZEVs ▪ The Low Carbon Fuel Standard (2006) program that aims at decreasing the carbon intensity transportation fuel ▪ The Innovative Clean Transit program (2018): sets a statewide goal for public transit agencies to transition to 100% zero-emission bus fleets by 2040 More details of California's plans and programs here.

[86] California Air Resources Board, "Cap and Trade program", more details here.

State Factsheet

NEW YORK

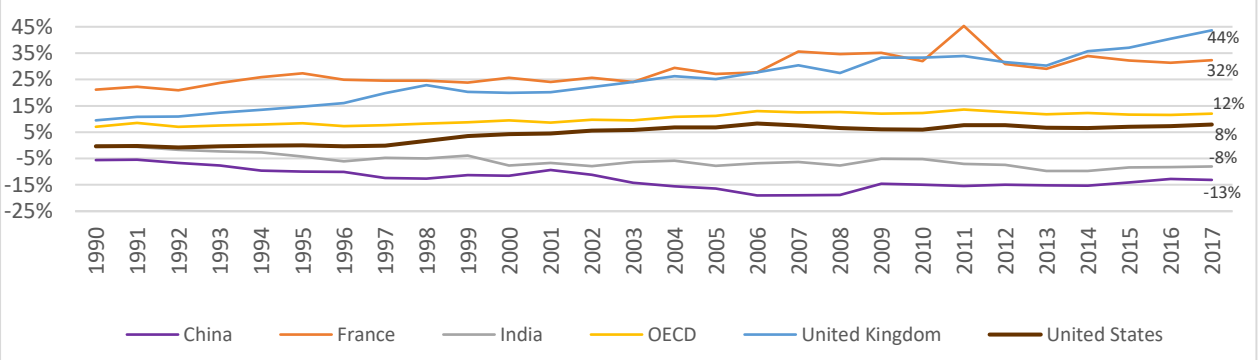
In June 2019, New York has passed a landmark law that set the target of 100% carbon-free electricity by 2040 and economy-wide; net zero carbon emissions by 2050, called the "Climate Leadership and Community Protection Act".
New York also led the way with the nation's first congestion pricing system, banished plastic bags and banned offshore oil and gas drilling, among other initiatives. The state is also one of the co-founder states of the Climate Alliance.

State Data	Objectives & targets	Major policies & regulations
(2019) **Population** 19,453,561 **Income per capita** (2018) 68,668 **Unemployment rate** 4.0% **Major source of GHG emissions** Stationary energy (used by buildings and other stationary source) 66%[87]	▪ Achieving a carbon-free electricity system by 2040 ▪ Reaching net-zero carbon emission by 2050 New York has statutory targets enacted in 2019 calling for: ▪ Reducing GHG emissions 40% below 1990 levels by 2030 and no less than 85% below 1990 levels by 2050 ▪ Reaching net-zero GHG emissions by 2050	**Climate Framework** ▪ The Climate Leadership and Community Protection Act (2019): sets the goal to achieve a carbon-free electricity system by 2040, to reach net-zero carbon emission by 2050 economy-wide, and to reduce GHG emissions 85% below 1990 levels by 2050 **Power Generation** ▪ The Clean Energy Standard (2016): sets the goal of 50% of electricity be from renewable resources by 2030 ▪ The State puts an end to coal-fired power plants **Transportation** ▪ The Charge NY program 2.0 (2019): supports Zero-Emissions Vehicles by increasing the number of charging stations and sets the goal of installing at least 10,000 charging stations statewide by the end of 2021 More details of NY's plans and programs here.

Sources: United States Department of Agriculture, 2020 (available here); U.S Climate Alliance 20

[87] New York City Mayor's Office of Sustainability, "New York City Greenhouse Gas Emissions", available here.

Annex 13: CO2 emissions embedded in trade from 1990 to 2017



Sources: Our World In Data (2019); Global Carbon Project (2018)

Annex 14: What is the Green New Deal?

The Green New Deal has become a key element in the evolution of political awareness on environmental issues in recent months, particularly on the Democratic side, with more than half of the candidates supporting it.

The Green New Deal is a ***14-page text proposal identifying the consequences of climate change and the objectives that must be achieved by the U.S,*** *taking into account the social and economic stakes. It is a strong ideological project that supports the ecological transition as a springboard for job creation and economic growth. The plan has been developed by New Consensus, a think tank founded by several left-leaning activists in 2018, and carried by representative A. Ocasio Cortez and Senator E.D. Markey in front of the House of Representatives in July 2019.*
Inspired by the New Deal put in place by Franklin Roosevelt's government between 1935 and 1939 to revive the economy, with a major program of job creation and social security the deal's document is reportedly based on the Special Report on Global Warming of 1.5 ºC" by the Intergovernmental Panel on Climate Change and the November 2018 Fourth National Climate Assessment report[88].

The document calls on the U.S to both ***recognize its role in global greenhouse gas emissions and assume its role as a technological leader anchored in a multilateral and common international policy****. It makes sense in the current social context in the United States by reconnecting economic policy with climate policy, stressing that the ecological transition is an opportunity for the labor market and economic activity. The cross-sectorial social, economic and environmental approach of the Green New Deal makes its strength, as it appeals to both American workers who are resistant to environmental policies and climate activists.*

The Deal also demonstrates how climate change, pollution, environmental destruction reinforce inequality. On this basis, the text asks the House of representatives to recognize that "economic mobilization on a scale not seen since World War II" have to been pushed: in order to create new well-paid jobs and to develop a high level of economic prosperity and decrease systemic injustices.

The aim of the Green New Deal is to create a consensus on the causes, consequences and solutions to the climate crisis.

*Two goals are identified to avoid the worst consequences of climate change in the Green New Deal****:***

1. *Global reductions in greenhouse gas emissions from human sources of 40% to 60 % from 2010 levels by 2030*
2. *Net-zero global emissions by 2050*

Mains recommendations of the Green New Deal:

1. *Sourcing 100% of the country's electricity from renewable and zero-emissions power*
2. *Digitizing the nation's power grid*
3. *Upgrading every building in the country to be more energy-efficient*
4. *Overhauling the nation's transportation system by investing in electric vehicles and high-speed rail*

The Green New Deal highlights social and economic issues that the U.S are facing, such as:

- *The stagnation of hourly wages since the 1970s despite the increase in worker productivity*
- *The racial inequalities in terms of wealth: a difference of 20 times more wealth between the average white family and the average black family*
- *The Gender Pay Gap in the U.S: women earning approximately 80 % as much as men, at the median*

The limit of the Green New Deal:

Although he made the headlines, the Green New Deal is non-binding, as it is a document of only 14 pages calling for an ambitious social and environmental policy ***but detailing very few precise measures to achieve the objectives****. It is more of a first step for Democratic Party in building consensus on a strategy than a precise roadmap. When we compare the Green New Deal to the Citizens' Climate Convention, which put forward 149 proposals with a set of 150 French citizens to make the climate transition consistent with social justice, the Green New Deal seems to be a text that is quite devoid of solutions.*

[88] Intergovernmental Panel on Climate Change, Special Report available here

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