



U.S. Rep. Diana DeGette

The Clean Energy Innovation and Deployment Act

The Clean Energy Innovation and Deployment Act of 2019 will be the power-sector section of a bill that will lead to a 100 percent clean energy economy by 2050. This note describes the challenges the bill is intended to address and provides a summary of the bill.

Observations and assumptions

The Clean Energy Innovation and Deployment Act is based on the following observations and assumptions:

- The Intergovernmental Panel on Climate Change (IPCC) Special Report on Global Warming of 1.5o C (IPCC 1.5) indicates that **we need to cut greenhouse gas emissions in half by 2030 and achieve net-zero emissions by 2050.**
- **We have not however yet identified the technologies that would allow us to achieve a zero-emission US electricity sector** while guaranteeing the affordable reliable electricity that Americans demand. We can sharply reduce carbon emissions with massively-increased deployment of renewables and efficiency, but do not have today the technologies needed to provide cost-effective seasonal energy storage, which would be necessary to support vast amounts of intermittent renewable energy resources, such as wind and solar energy.
- Given today's technology, even with a massive deployment of renewable energy and energy efficiency, **we would need to maintain existing nuclear power plants and use natural gas power plants** to provide electricity during the seasonal low points of wind and solar energy.

- All that said, technology innovation often happens much faster than anticipated, and will be the key to transitioning to an affordable reliable zero-emitting electricity sector. Because we must get to net zero emissions by no later than 2050, and do not yet know what technologies will allow us to do that, **we must be open to and invest in the widest possible array of zero-emitting technologies**, including efficiency, renewables, storage, nuclear, and fossil with carbon capture, utilization, and storage (CCUS). In addition, we must prepare to offset emissions from the sector that cannot be completely eliminated by 2050.
- On the particular question of CCUS, even setting aside the power sector, **we will need to advance the development and deployment of CCUS**, because: (a) certain manufacturing processes (e.g., cement manufacture) release much of their carbon dioxide as a result of the chemical processes involved, not just their energy use, and we need to keep their emissions out of the atmosphere, (b) IPCC 1.5 tells us that we will need massive deployment of carbon dioxide removal to bring temperatures back down to 1.5 degrees Celsius, and (c) China, India, Eastern Europe and Africa, among others, are going to continue to burn coal and gas for the foreseeable future, and the United States is best positioned to develop CCUS technologies to the point that they become inexpensive enough for those places to use them.

Summary of The Clean Energy Innovation and Deployment Act

Title I: Innovation through investment in critical clean energy technologies

- **DOE and other agencies will implement measures that address the commercialization and deployment challenges of a range of critical clean energy technologies.** Several technologies that will be critical components of a zero-emitting electricity sector need assistance to move to full-scale commercial availability. The facilitative measures will include access to ARPA-E and the DOE labs, and financial support for RD&D into long-term energy storage and carbon storage infrastructure, among other things.

Title II: Deployment through a Clean Energy Standard

- **Power companies will provide an increasing fraction of their electricity through clean energy under a Clean Energy Standard (CES).** This federal CES will be similar to the renewable energy standards (RES) and CES's found in most states. The clean energy fraction will grow by 2030 to the percentage projected to result in a 50% reduction of CO2 emissions below 2005 levels from the power sector. By 2050, the clean energy fraction will be 100%. In the event that technology has not advanced sufficiently by 2050 to generate all electricity through non-emitting resources, the price cap / reverse auction mechanism described below will be activated, resulting in net zero emissions from the power sector, rather than literally zero emissions.

- **All zero- and low-emitting technologies will be credited.** The CES will be completely neutral in its treatment of non- and low-carbon electricity-generation technologies – providing credit to renewable energy, nuclear power, natural gas, fossil/CCS sources, and any power-generating source to the extent that it emits less CO₂ than an efficient coal-burning power plant. (See below for more on natural gas.)
- **The price of Clean Energy Credits will be effectively capped, preventing price spikes.** In order to protect rate-payers, power companies will be able to pay an “Alternative Compliance Payment” (ACP) instead of submitting Clean Energy Credits (CEC), in effect making the price of an ACP a cap on the price of CECs. The bill will list specific dollar values for the ACP for every year from 2022 to 2050. The ACP for 2022 will be 150% of the projected price of a CEC in 2022. The ACP for 2050 will be set at the projected price of a CEC under a CES requiring 80% clean energy by 2050. In other words, there will be no difference in the expected cost of compliance between this bill and an 80%-by-2050 bill.
- **When the price cap is triggered, electricity-related carbon mitigation will continue.** Any revenue raised through ACPs will fund a “reverse auction” for carbon dioxide emission avoidance (e.g., through beneficial electrification of vehicles and space and water heating), providing funding for only those activities which are the most cost-effective, as measured in dollars per ton of carbon mitigated. Because the marginal cost of these carbon mitigation activities will likely be lower than the marginal cost of reducing the direct carbon emissions of power plants, this “safety valve” mechanism will beat the carbon budget in years when it is activated, guaranteeing by 2050 net-zero emissions – if not net-negative emissions.
- **Natural gas power plants will eligible for clean energy credit, though the associated methane emissions will be accounted for.** Natural gas is currently used to generate electricity, to heat homes and other buildings, and as an input in many manufacturing processes. However, methane, the primary ingredient of natural gas, has over 80 times the global warming potency of carbon dioxide when its impact is assessed over a twenty-year period. Methane leakage, venting and flaring will be accounted for in awarding Clean Energy Credits to natural gas-fired generating units. Power companies able to demonstrate that their natural gas suppliers are wasting less methane than the national average will be able to use that fact in acquiring Clean Energy Credits, thus creating an incentive for methane waste prevention.

Title III: Accelerated Deployment of Breakthrough Technologies

- **Power companies prepared to move quickly to 100% clean energy will be given a Clean Energy Acceleration Production Tax Credit.** While we do not appear today to have the technology necessary to guarantee affordable reliable zero-carbon electricity for the entire country, one can imagine a scenario in which technological breakthroughs, for example in seasonal energy storage, would allow a transition to a zero-emitting electricity sector much sooner than 2050. This provision will provide both the incentive and the support for companies to take rapid advantage of such breakthroughs. Power companies replacing all of their CO₂-emitting generating units by 2025 will receive a Clean Energy Acceleration Production Tax Credit for the replaced energy. Companies will receive 75% of the credit if they replace their CO₂-emitting units by 2030, 50% of the credit if by 2035, and 25% of the credit if by 2040. The bill will also address the challenges power companies have using tax credits.

Title IV: Assistance for low-income rate-payers

- **Low-income rate-payers will receive assistance.** A policy analogous to the Weatherization Assistance Program (WAP) and the Low Income Home Energy Assistance Program (LIHEAP) will ensure that electricity remains affordable for low-income households.