



**Senate Energy & Natural Resources Committee
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Testimony on Carbon Capture & Sequestration Legislation

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Mr. Chairman, I am pleased to testify before the Senate Energy and Natural Resources Committee on behalf of the 700,000 members of the Environmental Defense Fund. Since 1967, EDF has linked science, economics and law to create practical solutions to society's most urgent environmental problems.

There is no more urgent environmental problem facing our world today than global climate change. A changing climate will have significant disruptive effects on our economy and our environment. Current methods of energy production are a major source of the pollution causing climate change. They have brought us great prosperity, but this prosperity is not sustainable. Fortunately, there is a bright economic future for the United States in a low carbon, clean energy economy. EDF's Energy Program is singularly focused on accelerating our nation's transition to this bright future. The work of this committee is critically important to achieving this bright future, and we are happy to do all we can to assist you in your work.

EDF strongly believes that the most important thing we can do to accelerate our nation's transition to a low carbon, clean energy economy is to put a price on carbon through federal climate and energy legislation. Unless and until there is an economic reason to avoid dumping greenhouse gas pollution into the environment, advanced new technologies that excel at delivering clean, low carbon energy will sit on the shelf. There simply will be no market for them. A price on carbon creates that market, and will stimulate innovation and investment in a wide array of new clean energy technologies and clean energy services, at a scale and pace that only the private sector can deliver.

At the same time, we know that a price on carbon, by itself, will not achieve everything we would like to achieve in the timeframe we need to achieve it. Sometimes limited efforts to remove economic stumbling blocks, or clarify legal or regulatory relationships are required. The bills that are the topic of this hearing today highlight this point.

The bills before this Committee today deal with largely with the challenge of charting a new course for coal. We will not get to where we need to go in terms of dramatically reducing greenhouse gas pollution and substantially reducing the current environmental foot print of our energy economy by continuing on a business as usual path with coal. Coal fired power plants are the single largest source of carbon dioxide pollution in our nation today, and current methods of coal production and use place too often place a heavy and unacceptable burden on public health and the environment.

At EDF, we recognize that coal will likely play an important role in our economy - and the economy of many other industrial nations - for many years to come. Therefore, the challenge is to develop and deploy technologies and strategies that can substantially reduce or prevent the worst consequences of coal production and use. Carbon capture and storage is critical to the future of coal, and indeed, over the long term, natural gas as well.

Geologic sequestration of carbon dioxide is feasible under the right conditions. It has been successfully demonstrated in a number of field projects, including several large, “commercial” scale projects. In 2005, the IPCC Special Report on Carbon Capture and Storage concluded that the fraction of carbon dioxide (CO₂) retained in “appropriately selected and managed geologic reservoirs” is likely to exceed 99 percent over 1000 years.

The IPCC also concluded that the local health, safety, and environmental risks of CCS are comparable to the risk of current common activities such as natural gas storage, enhanced oil recovery, and deep underground storage for acid gas, *if* there is “appropriate site selection based on available subsurface information, a monitoring programme to detect problems, a regulatory system and the appropriate use of remediation methods to stop or control CO₂ releases if they arise.” The IPCC and others with geology expertise have also noted that the risk of leakage will tend to decrease with time.

As a technical matter, CCS is ready to begin commercial deployment today. All of the necessary technologies exist. What is missing is the market driver to cause companies put the pieces together. As stated earlier, this comes with a price on carbon.

But beyond this, what can help accelerate the development and deployment of CCS technologies is a clear legal framework for securing subsurface rights for geologic storage of CO₂, and judicious use of federal dollars to accelerate the learning curve on CCS development and deployment. The bills proposed by Senator Barraso and Senator Casey make important contributions in this regard.

Based on the history of other technologies, we fully expect that the costs of CCS deployment will come down and project development will become routine. As we understand it, the intent of Senator Casey’s bill is that the federal government, through the Department of Energy’s National Energy Technology Lab (NETL) in Pittsburgh,

should be a full partner with industry in identifying those strategies and practices that will yield the best results in terms of safe, effective, and efficient capture and storage of CO₂ pollution from coal. We support this objective.

As government and industry do this work, we strongly advise that specific attention needs to be paid to the importance of proper site selection and proper site operations. Geologic sequestration is not something that can be done just anywhere, casually, or with limited skill. It requires sophisticated preparation, execution, and oversight by both the companies and regulators involved.

In particular, one of the most important objectives in assuring the safe, successful geologic sequestration of CO₂ is assuring that formation fluids – the brines pre-existing in the sandstone formations where the CO₂ is to be stored – are not driven out of the underground storage area and into an underground source of drinking water. NETL, in its partnerships with industry, will want to make sure that projects are identified and engineered in such a way that:

- 1) there are confining zones of sufficient quality and lateral extent to confine both displaced formation fluids and injected CO₂;
- 2) there is a definition of “zone of elevated pressure” that is designated to guard against either CO₂ or formation fluids being driven into a drinking water supply;
- 3) there is high quality modeling of both the injected CO₂ plume and the displaced formation fluids;
- 4) where necessary, there is monitoring of ground water quality and any geochemical changes above the confining zone; and.
- 5) there are remedial response plans in the event problems appear to be developing.

We would add that NETL’s work with industry should be specifically targeted at helping to further develop the appropriate analytical and monitoring tools and rigorous procedures for achieving the objectives outlined above.

As to Senator Barraso’s bill, it is essential that any federal legislation attempting to clarify pore space ownership on federal property not disrupt long-standing rules of property. Clear and predictable property rules are the cornerstones of free and functioning markets. It is our understanding that Senator Barrasso’s bill is modeled after pore space legislation enacted by the Wyoming Legislature for Wyoming, and that the purpose of Wyoming’s legislation was to clarify Wyoming’s rules in relation to past deeds and future transactions, without fundamentally changing the long-standing relationship between surface and subsurface rights in the state. Assuming this is the case, we support Senator Barraso’s efforts to accomplish a similar purpose for federally owned pore space on federal land.

For further consideration of the pore space ownership issue, I recommend to the committee a paper authored by Ian Duncan and Jean Philippe Nicot, of the Bureau of

Economic Geology, Jackson School of GeoSciences, University of Texas, Austin, and my colleague, Scott Anderson of EDF's Austin, Texas office, a copy of which is attached to this testimony.

EDF appreciates the opportunity to provide testimony on these two important pieces of legislation, and we look forward to working with Senator Casey, Senator Barrasso, Chairman Bingaman and the rest of the Committee to advance CCS in the context of comprehensive climate and energy legislation targeted at accelerating our nation's transition to a clean, low carbon energy economy.

Attachment