EDF ENVIRONMENTAL DEFENSE FUND
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U.S. CLIMATE

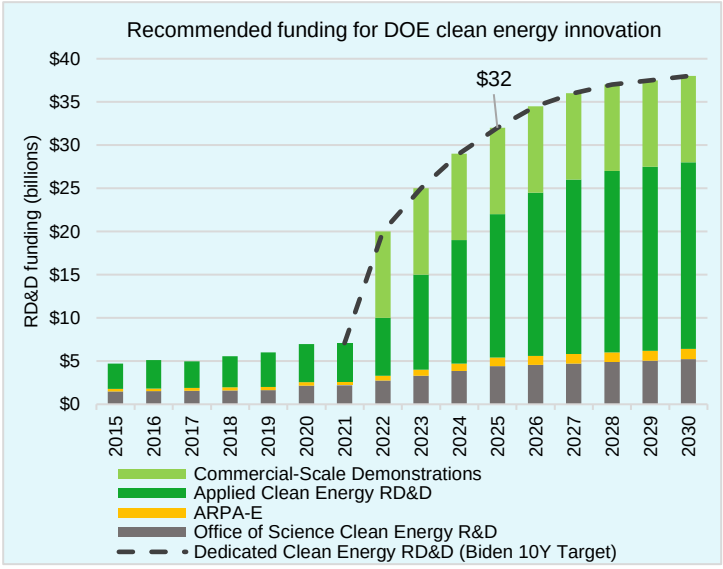
The Climate Innovation Blueprint:

Aligning federal energy innovation priorities and budgets with climate goals

To avert the worst effects of the climate crisis and recapture global leadership, the United States must aim to achieve net-zero emissions by no later than 2050. Innovation alone will not be enough – we need policy to limit emissions across the economy – but innovation plays a critical role in improving the tools we have today and developing emerging technologies needed to meet this challenge. Harnessing this innovation will also be key to positioning the U.S. to lead the rapidly growing global clean energy economy.

A larger clean energy innovation budget can be most effective at helping us achieve our climate goals if we prioritize the sectors and technologies that will drive the largest reductions in greenhouse gas emissions. EDF and Evolved Energy Research developed an analytical framework for assessing the emissions impact of potential breakthroughs in cost and performance across a set of clean energy technologies. Based on these results, as well as consideration of other expert literature and the Biden administration's innovation commitments, we offer a blueprint for aligning DOE innovation budgets and priorities with climate goals. DOE and Congress should:

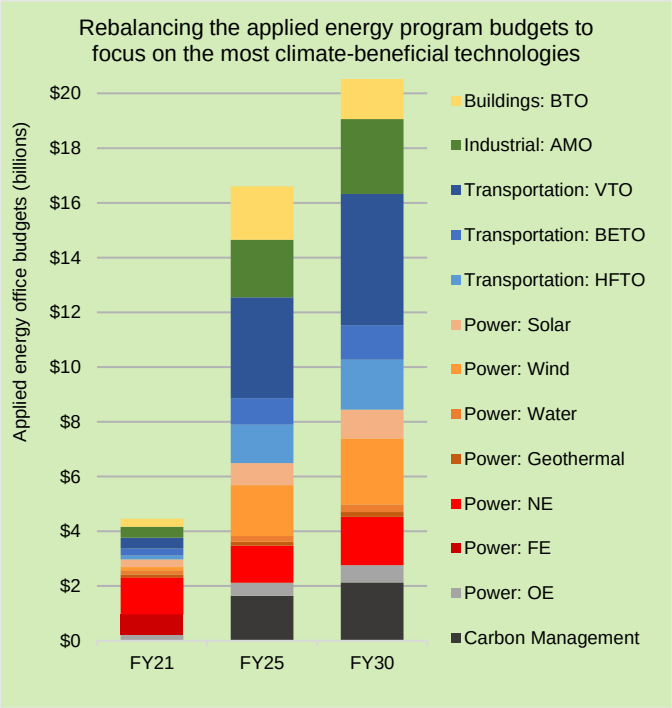
1. **Increase the clean energy research, development and demonstration (RD&D) budget at DOE to $32 billion by FY 2025.** This includes nearly $17 billion in the applied energy programs, $1 billion for ARPA-E, $4 billion for clean energy at the Office of Science, and $10 billion in commercial-scale demonstration projects. These budgets would put us on track to meet the Biden campaign commitment of $400 billion for clean energy and innovation over ten years, assuming 75% of funds go to DOE. They also echo recommendations from the National Academies of Sciences, Columbia University, and others.



2. **Rebalance the DOE portfolio to focus on technologies that that cut the most cumulative emissions.** Policymakers should align the applied energy program budgets with current emissions by sector, increasing budgets for offices focused on sectors under-represented in DOE's current budget – including transportation, industry and buildings – at a faster rate than those focused on the power sector. Within these sectors, policymakers can apply the Evolved Energy framework to adjust RD&D budgets in accordance with technologies' potential climate benefit should they experience a breakthrough, which leads to relative increases for technologies such as EV batteries, renewables, hydrogen electrolysis and geologic sequestration.

3. **Create cross-cutting programs that coordinate RD&D across 'complementary' technologies – those that can boost the deployment of other technologies in the energy system.** The Evolved analysis enables us to see system-wide benefits of technology progress, revealing complementary technology clusters. We recommend cross-cutting DOE programs for carbon management, electrification, clean fuels and industrial decarbonization.

4. **Update the formal mission of DOE's energy and science offices to be focused on reducing greenhouse gases and other harmful pollution.** However, we caution against using metrics such as cumulative emissions reductions as the *sole factor* in setting DOE innovation priorities. Other critical considerations include issues of environmental and energy justice; fairness for energy workers; and resilient, reliable, secure and affordable energy systems.



BTO = Building Technologies Office, AMO = Advanced Manufacturing Office, VTO = Vehicle Technologies Office, BETO = Bioenergy Technologies Office, HFTO = Hydrogen and Fuel Cell Technologies Office, NE = Office of Nuclear Energy, FE = Office of Fossil Energy, OE = Office of Electricity

Read the full report: The Climate Innovation Blueprint: An analytical framework for aligning federal energy innovation budgets with climate goals

Read the key findings from the Evolved Energy Analysis: Prioritizing Innovation for Decarbonization