WHY THE U.S. NEEDS CLIMATE INNOVATION

What is climate innovation?

Climate innovation is the creation of new or enhanced climate solutions through technology, public policy and investment models.

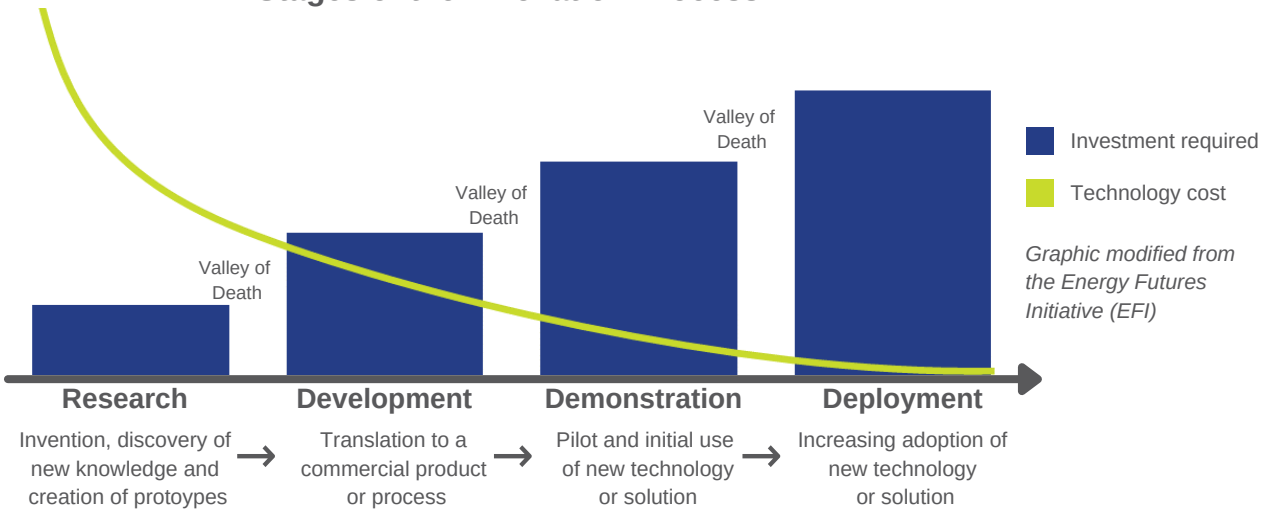
Why do we need climate innovation?

To avert the most damaging impacts of climate change, the U.S. will need to rapidly drive down emissions to net zero by no later than 2050 – a point at which we are releasing no more emissions than we can remove in a safe and responsible manner. To achieve this goal, we need to ramp up today's climate solutions, such as clean energy, electric vehicles and energy-efficient buildings to cut emissions in half this decade, while ensuring that benefits are shared equitably among communities. But that's not enough. According to the International Energy Agency, reaching net zero will require more technologies and solutions not yet widely available or affordable, such as carbon dioxide removal (CDR) to remove and permanently store carbon from the atmosphere, clean fuels for shipping and aviation, and offshore wind power. **Investment in climate innovation now, with inclusive and proactive planning, can improve and scale these solutions in the coming decades.**

What is the innovation process?

In the case of climate technology, creating new solutions typically requires a multi-year, four-stage process: **Research, development, demonstration and deployment.** While the level of investment needed increases with each stage, the cost of the technology falls as it improves over time. Sustained investment throughout the process is critical to avoid having a solution fall into what's called a "Valley of Death," where it fails to move forward because of a lack of funding or support.

Stages of the Innovation Process



A number of key players are involved in pushing a solution through each stage – from the federal government and national labs to universities, energy companies, investors and communities where solutions will be deployed. While many stakeholders typically contribute to the innovation process, **governments play a particularly important role in fostering innovations that benefit the public good, often with a high return on investment.** Reviews of six public clean energy R&D programs in the U.S. found a return on investment of 27% since 1975, and a benefit-to-cost ratio of 33:1.

What benefits can climate innovation create?

Climate innovation can bring benefits beyond fighting climate change, including:

Lower energy costs: Advanced energy technologies can lead to a more efficient energy system and greater savings for consumers.

Good-paying jobs: By building what we invent in the U.S., we can create good-paying, energy and manufacturing jobs.

Reduced pollution: New solutions designed to cut climate pollution can also reduce health-harming, air and water pollution caused by fossil fuels.

Equity: By centering equity and justice in innovation policy, potential cost-savings, health and economic benefits can lift up communities that have been historically burdened by pollution and higher energy costs.

Key clean energy technologies that benefited from federal investment in climate innovation:

- **Solar energy** costs have plummeted 89% in the last decade.
- **Wind energy** costs have fallen 70% in the last decade.
- **Electric car battery** costs have dropped 89% in the last decade.
- **Utility-scale battery storage** costs have declined nearly 70% between 2015 and 2018.

How can we boost U.S. climate innovation?

- ✓ **Increase federal investment now:** To meet the scale of the climate crisis, policymakers need to increase investment in climate innovation across the federal government. The RD&D budget at the Department of Energy (DOE) – a major player in climate innovation – should be increased to at least $32 billion by Fiscal Year 2025.
- ✓ **Rebalance spending priorities to tackle major sources of climate pollution:** The federal government's climate innovation portfolio should target under-funded sectors that are major sources of climate pollution, such as industry, buildings and agriculture; and within those sectors, prioritize the solutions with the greatest potential to generate climate benefits.
- ✓ **Maximize every stage of the innovation process:** The federal innovation budget tends to be weighted toward early-stage R&D, but critical climate tools need support throughout the entire innovation process to test solutions in communities and accelerate their adoption in the market.
- ✓ **Work hand-in-hand with communities to shape equitable solutions:** All groups and communities that have a stake in the potential job, health, climate and equity benefits from new solutions should be at the table throughout innovation policy planning. Additionally, DOE and other agencies should align with the Biden administration's Justice40 Initiative, ensuring that at least 40% of the benefits from federal investments in climate go to communities historically marginalized and overburdened by pollution.
- ✓ **Accelerate private sector investment:** Businesses have an essential role to play in deploying capital, increasing market demand for innovation, and scaling climate solutions across industries and supply chains. Companies can also support progress by using the most powerful tool they have to fight climate change: their political influence.

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