

Carbon Neutrality Policy Updates for the United States

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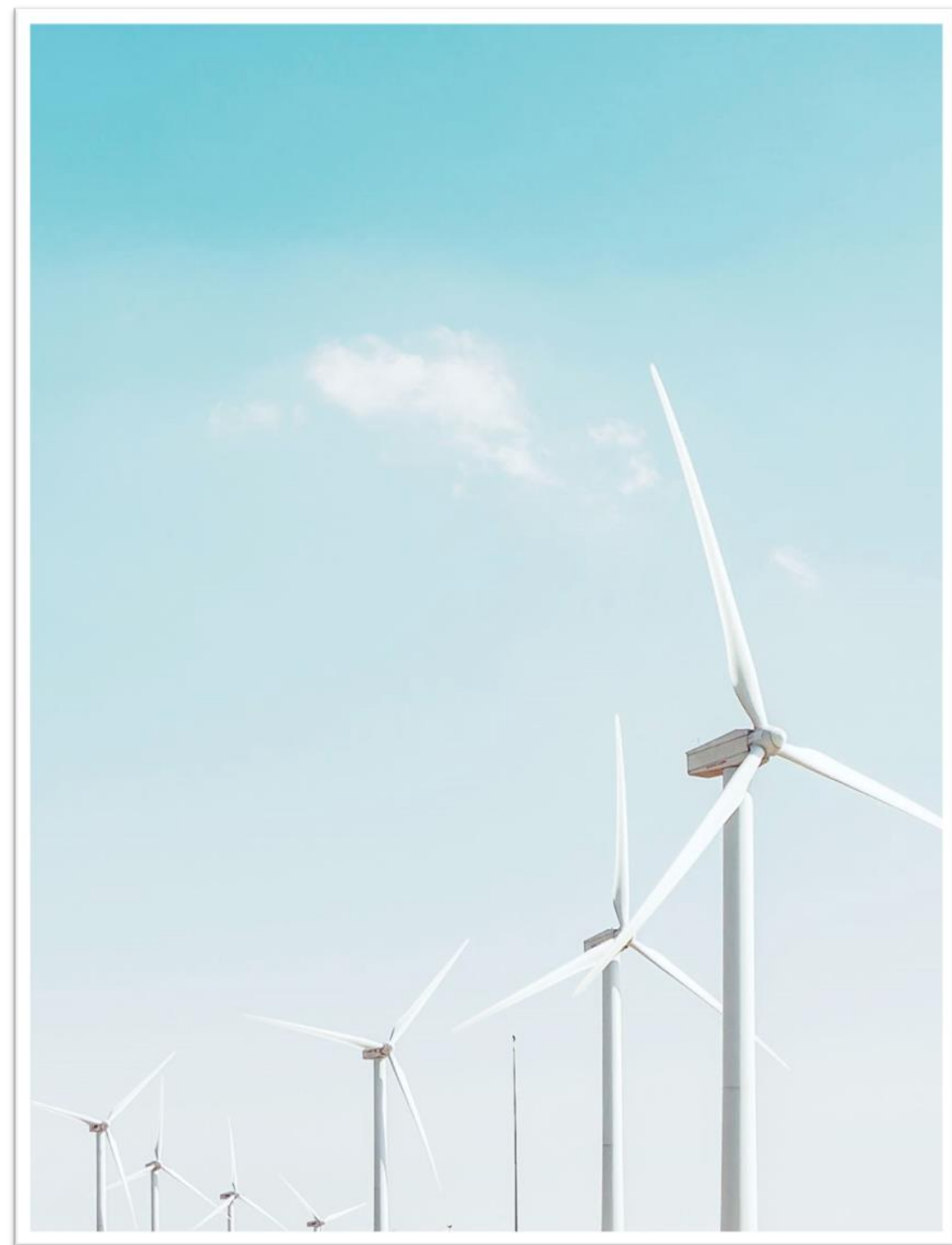
Senior Vice President, Asia Pacific Energy Research Centre (APERC)

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Outline

- Biden Administration Goals
- Legislation, Regulation, and International Cooperation
- Energy Earth Shots
- Conclusions



Goals: Combat climate change & transition to a low-carbon economy

- Economy-wide net-zero by 2050
- 2030 emission reduction targets: 50-52% by 2030
- Clean Energy Transition: carbon free power by 2035
- Electrification of Transport: 50% zero emission vehicle sales by 2030
- Decarbonize Industry: hydrogen and CCUS
- Resilience and Adaptation
- International Collaboration



Bipartisan Infrastructure Law



CLEAN ENERGY
TRANSITION
US\$62 BILLION



BATTERIES
US\$2.8 BILLION

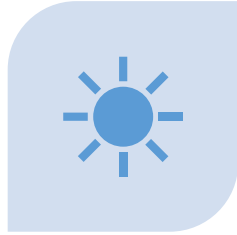


CARBON
MANAGEMENT
US\$4.9 BILLION



HYDROGEN HUBS
US\$7 BILLION

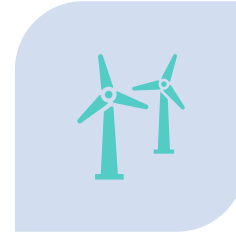
Inflation Reduction Act



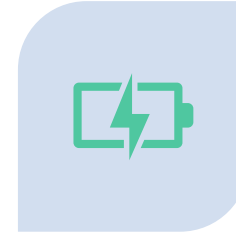
**CLIMATE AND
CLEAN ENERGY**
US\$369 BILLION



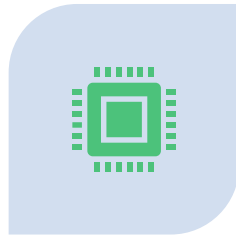
**RESIDENTIAL
BUILDINGS**
US\$9 BILLION



**CLEAN ENERGY
TECHNOLOGIES
MANUFACTURING**



**CLEAN ELECTRICITY
STORAGE**
US\$30 BILLION



**TECHNOLOGY
DEPLOYMENT**
US\$27 BILLION



**METHANE EMISSIONS
REDUCTION
PROGRAM**



**ENVIRONMENTAL
JUSTICE**
US\$3 BILLION



RURAL COMMUNITIES
US\$20 BILLION



ENERGY

earthshots

U.S. DEPARTMENT OF ENERGY

*accelerating breakthroughs of more abundant, affordable,
and reliable clean energy solutions within the decade*

Affordable Home Energy Shot™

Reduce the cost of energy-efficient retrofits in affordable homes by 50% and decrease residents' energy costs by at least 20% within a decade.



DOE has identified three key R&D areas to enable cost savings and energy efficiency improvements through integrated designs that deliver whole-home solutions:



BUILDING UPGRADES

Improved livability and comfort make homes more resilient.

Advanced leakage detection

Low-impact retrofit techniques

Panelized exterior insulation



EFFICIENT ELECTRIFICATION

Innovations that streamline systems and lower costs enable affordable and adaptable installation.

Lower-voltage equipment

Plug-and-play heat pump designs

Integrated ventilation packages



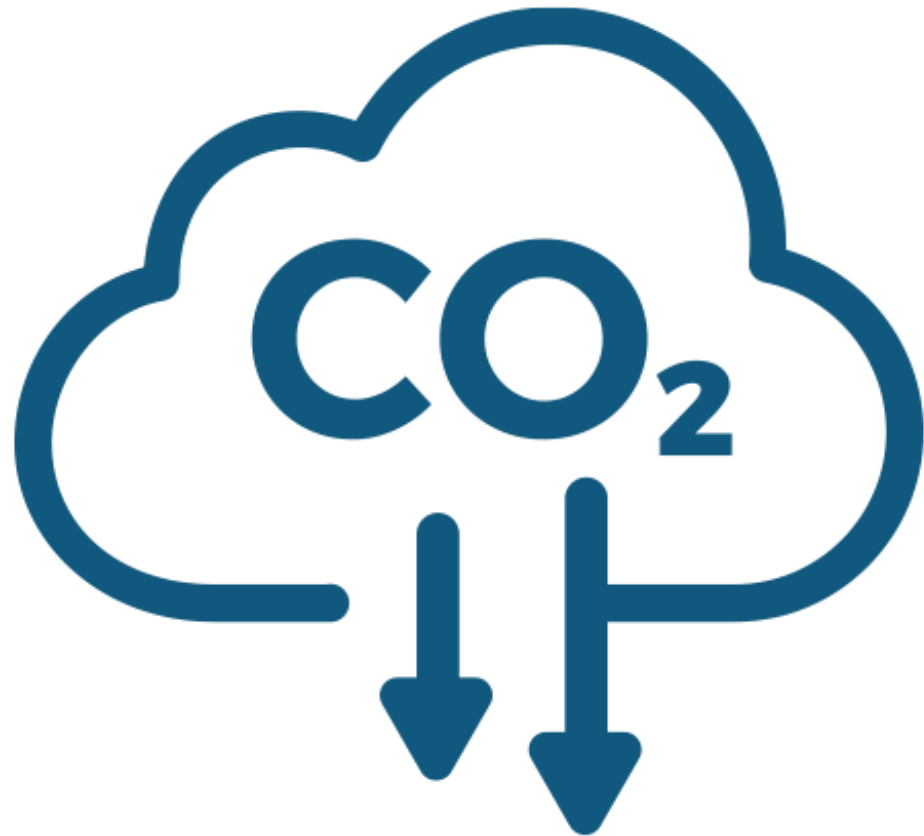
SMART CONTROLS

Flexible energy loads transform homes into energy resources.

Smart electric panels and load management

Grid-interactive technologies

Shared circuit control between loads



Carbon Negative ShotTM

Remove CO₂ from the atmosphere and durably store it at meaningful scales for less than \$100/net metric ton of CO₂-equivalent within a decade.



Clean Fuels & Products ShotTM

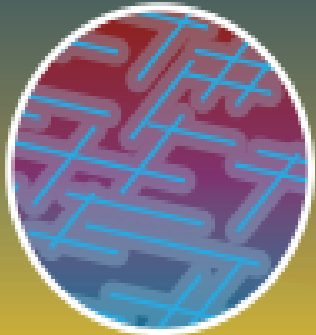
Decarbonize the fuel and chemical industry through alternative sources of carbon to advance cost-effective technologies.



Enhanced Geothermal Shot™

Reduce the cost of enhanced geothermal systems by 90%, to \$45 per megawatt hour by 2035 to unlock Earth's nearly inexhaustible heat resources to provide reliable, clean power for Americans and expand opportunities for a robust domestic geothermal industry.

A human-made enhanced geothermal system (EGS) can extract heat from tens of thousands of feet below the surface and put it to good use.



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+



+



*What
makes EGS?*

An abundant,
previously inaccessible,
heat source

Fluid injected from
the surface

Pathways expanded by
injected fluid

With an enhanced geothermal reservoir, you can generate power anywhere with hot rocks deep underground!



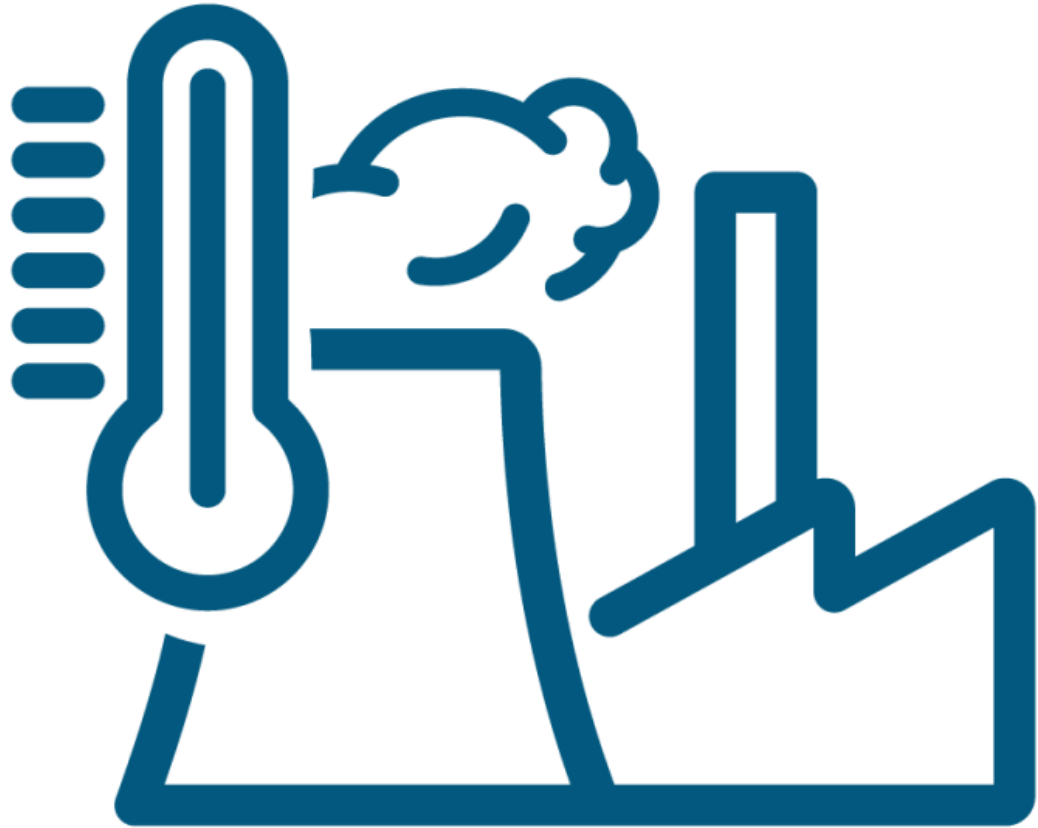
Floating Offshore Wind ShotTM

Drive down costs to \$45 per megawatt hour by 2035 to spur U.S. leadership in floating offshore wind technology, accelerate decarbonization, and deliver benefits for coastal communities.



Hydrogen ShotTM

Accelerate innovation and spur demand of clean hydrogen by reducing the cost by 80%, to \$1 per 1 kilogram of clean hydrogen within 1 decade.



Industrial Heat ShotTM

Develop cost-competitive industrial heat decarbonization technologies with at least 85% lower greenhouse gas emissions by 2035.

DOE has identified three key methods to decarbonize industrial heat and achieve the target:



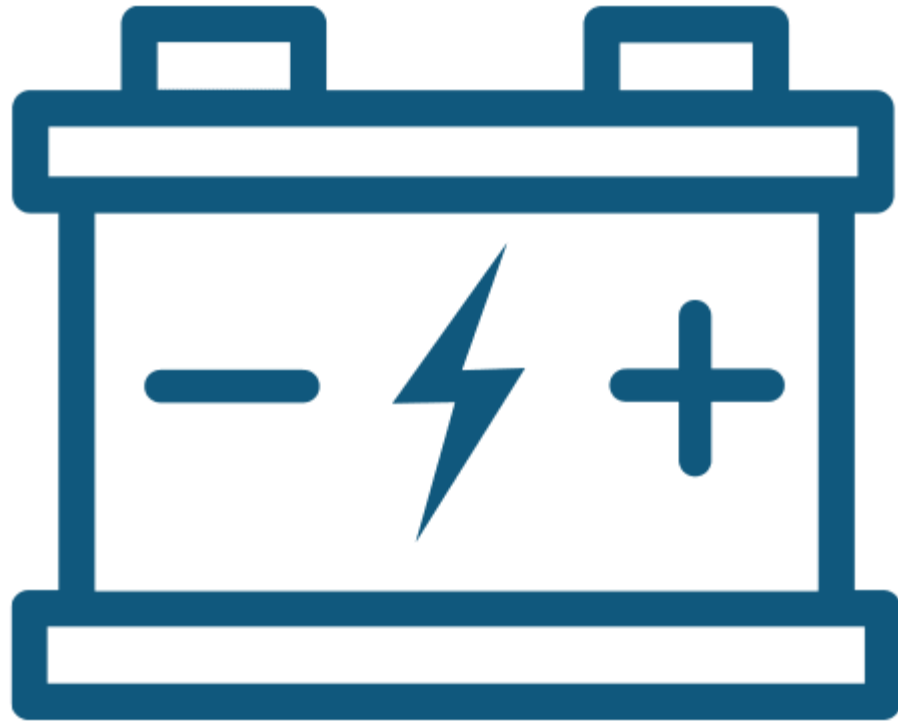
ELECTRIFICATION
of heating operations



**INTEGRATION OF
LOW-EMISSIONS HEAT
SOURCES** (such as geothermal
energy, concentrated solar power,
or nuclear energy)



INNOVATIVE
low- or no-heat process
technologies



Long Duration Storage ShotTM

Achieve affordable grid storage for clean power—anytime, anywhere—by reducing the cost of grid-scale energy storage by 90% for systems that deliver 10+ hours of duration within the decade.

State-level Initiatives

- **California**
 - Climate Plan
- **New York**
 - Green New Deal
- **Oregon**
 - Climate Resilience Package
- **Hawaii**
 - Clean Energy Initiative



International Cooperation



Paris Agreement



Green Climate Fund



Carbon Management
Challenge



Decarbonizing
International
Shipping



Ending Deforestation



Global Methane
Pledge



Kigali Amendment
(Reducing HFCs)



Accelerating CCUS
And CDR
Technologies

Conclusion

The Biden Administration made Climate Change a top priority from the very start by setting goals, supporting legislation, enacting regulations, and funding innovation.

The Inflation Reduction Act and the Bipartisan Infrastructure Law were the two key pieces of legislation estimated to provide on the order of 1 trillion USD to accelerate the transition.

The Energy Earthshots programs are designed to increase innovation in 8 areas.

International cooperation is a key component of the U.S. approach to carbon neutrality.

Thank you

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