



Federal Legislation and Incentives for Clean-Energy Manufacturing and Industrial Decarbonization

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Overview

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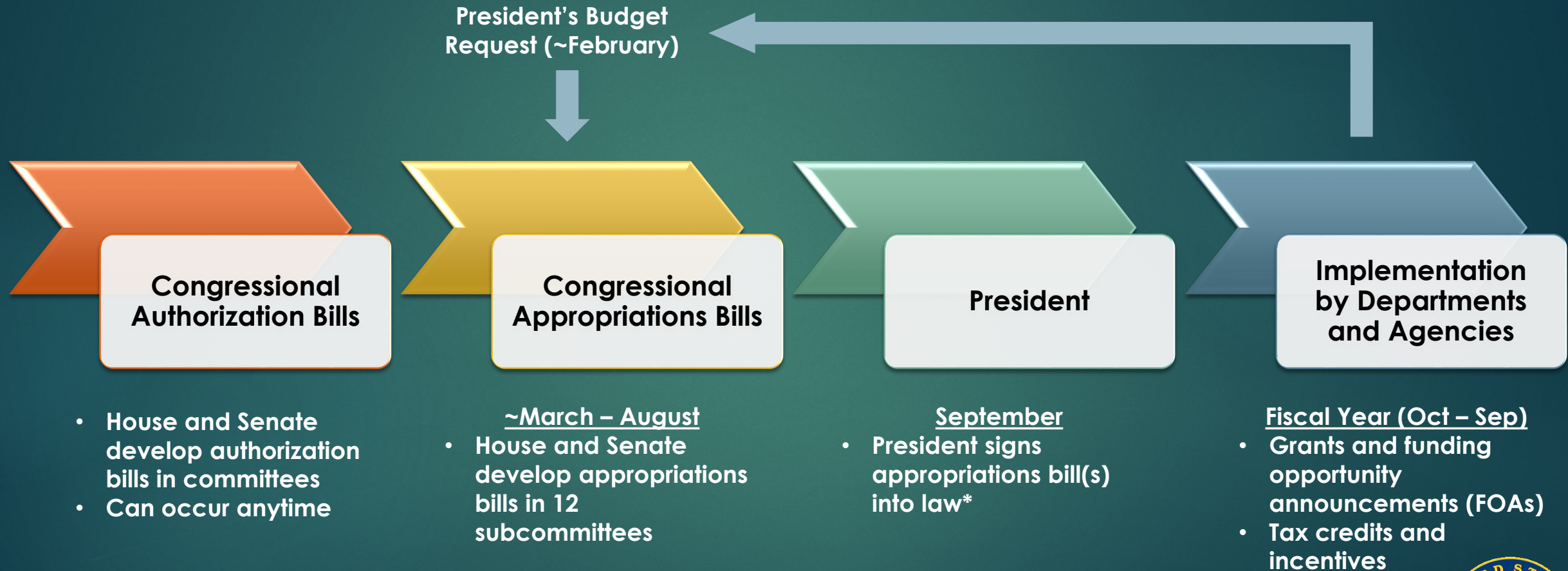
- ▶ Federal Appropriations
- ▶ Federal Legislation
 - ▶ BIL, IRA, and CHIPS & Science Acts
- ▶ DOE Implementation



How does funding flow down to you?

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(Regular federal appropriations process)



*If a budget is not passed by the start of the fiscal year (Oct. 1), congress can pass a continuing resolution



Congressionally Directed Spending

“Earmarks” or “Community Project Funding”

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- ▶ Members submit requests to appropriations subcommittees for discretionary funding
- ▶ Local projects and non-profit entities can receive up to several million dollars
- ▶ Does not increase federal spending
 - ▶ Comes from agency budgets



Federal Legislation

CLEAN ENERGY MANUFACTURING AND INDUSTRIAL DECARBONIZATION

Federal Legislation

Clean-Energy Manufacturing and Industrial Decarbonization

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- ▶ Infrastructure Investment and Jobs Act (2021)
 - ▶ “Bi-Partisan Infrastructure Law” or “BIL”
- ▶ Inflation Reduction Act of 2022
- ▶ CHIPS & Science Act of 2022



Federal Legislation

Clean-Energy Manufacturing and Industrial Decarbonization

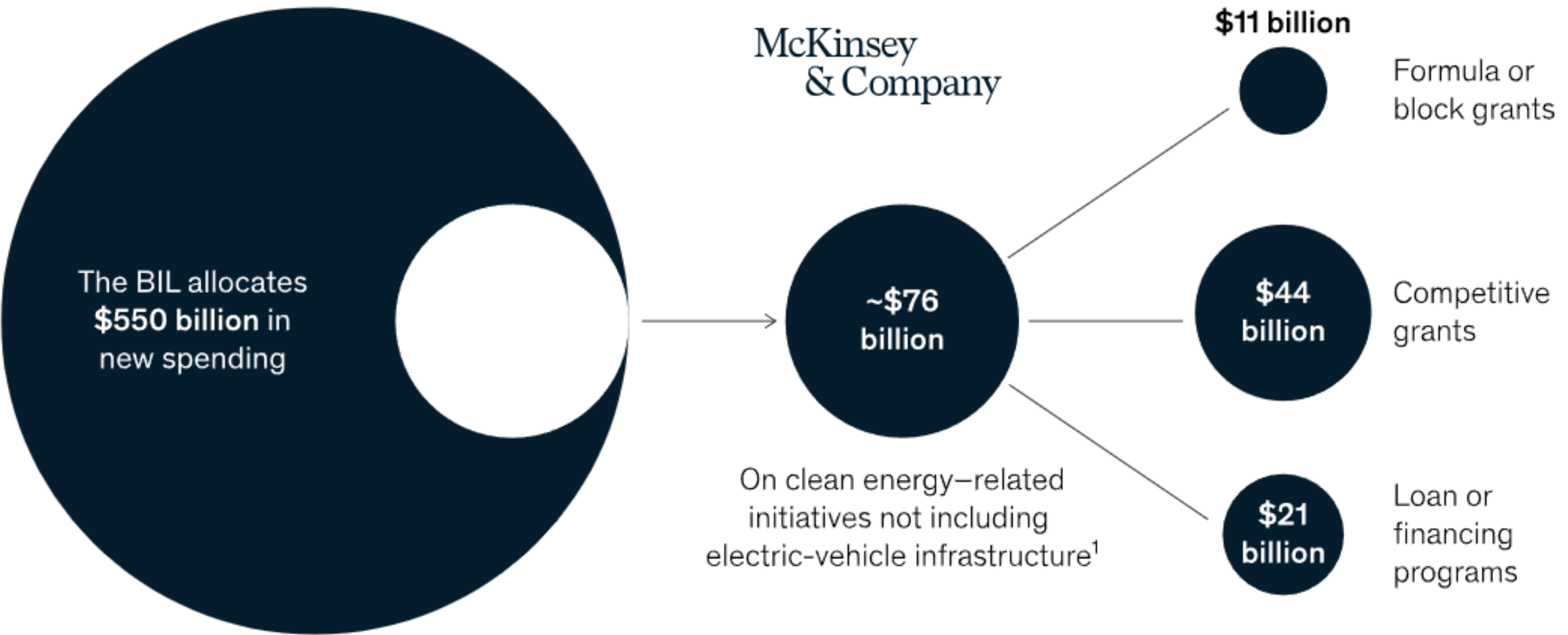
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Sources: [McKinsey & Co.](#),¹ [DOE](#)²

	Infrastructure Investment and Jobs Act (2021)	Inflation Reduction Act of 2022	CHIPS & Science Act of 2022
Purpose	Improve infrastructure including clean energy, transportation, water, broadband	Reduce carbon emissions, lower healthcare costs, fund IRS	Bolster domestic semiconductor manufacturing and R&D
Funding Amount	<ul style="list-style-type: none">• \$550 billion in new spending (\$1.2T total)¹• ~\$76 billion for clean energy¹; \$62B for DOE²	<ul style="list-style-type: none">• ~\$500 billion in new spending/tax breaks¹• \$394 billion for clean energy¹	<ul style="list-style-type: none">• \$50B for semiconductor domestic manufacturing¹• \$81B for NSF¹• \$67B for DOE S&T¹
Funding Type	Competitive grants	Tax incentives, grants, and loan guarantees	Grants, tax incentives, and loan guarantees

Bipartisan Infrastructure Law (BIL) investments

<https://www.mckinsey.com/capabilities/sustainability/our-insights/one-year-into-the-bil-catalyzing-us-investments-in-energy>



¹An estimate of BIL clean-energy funding, which includes a combination of clean-energy, resilience, and environmental-remediation funding related to the utility and power sector. This does not include electric vehicle-related funding.

Infrastructure Investment and Jobs Act

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- ▶ **Supply Chains for Clean Energy Technologies**
 - ▶ \$3 billion for FY22-26 for **battery material processing grants**
 - ▶ \$3 billion for FY22-26 for **battery manufacturing and recycling grants**
 - ▶ \$100 million for FY21 – 24 for **critical mineral mining, recycling, and reclamation**



Infrastructure Investment and Jobs Act

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- ▶ **Carbon Capture, Utilization, and Storage**
 - ▶ \$3.5 billion for FY22-26 for **direct air capture hubs**
 - ▶ \$2.5 billion for FY22-26 for CO₂ **sequestration**
 - ▶ ~\$300 million for **utilization** of carbon oxide products
 - ▶ ~\$1 billion for FY22-26 for CO₂ **transport infrastructure**



Infrastructure Investment and Jobs Act

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► Hydrogen R&D

- \$8 billion for FY22-26 for at least four regional **hydrogen hubs**
- \$500 million for FY22-26 for clean hydrogen **manufacturing** and **recycling** program
- \$1 billion for FY22-26 for **clean hydrogen** from **electrolyzers**



Federal Legislation

Clean-Energy Manufacturing and Industrial Decarbonization

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Inflation Reduction Act

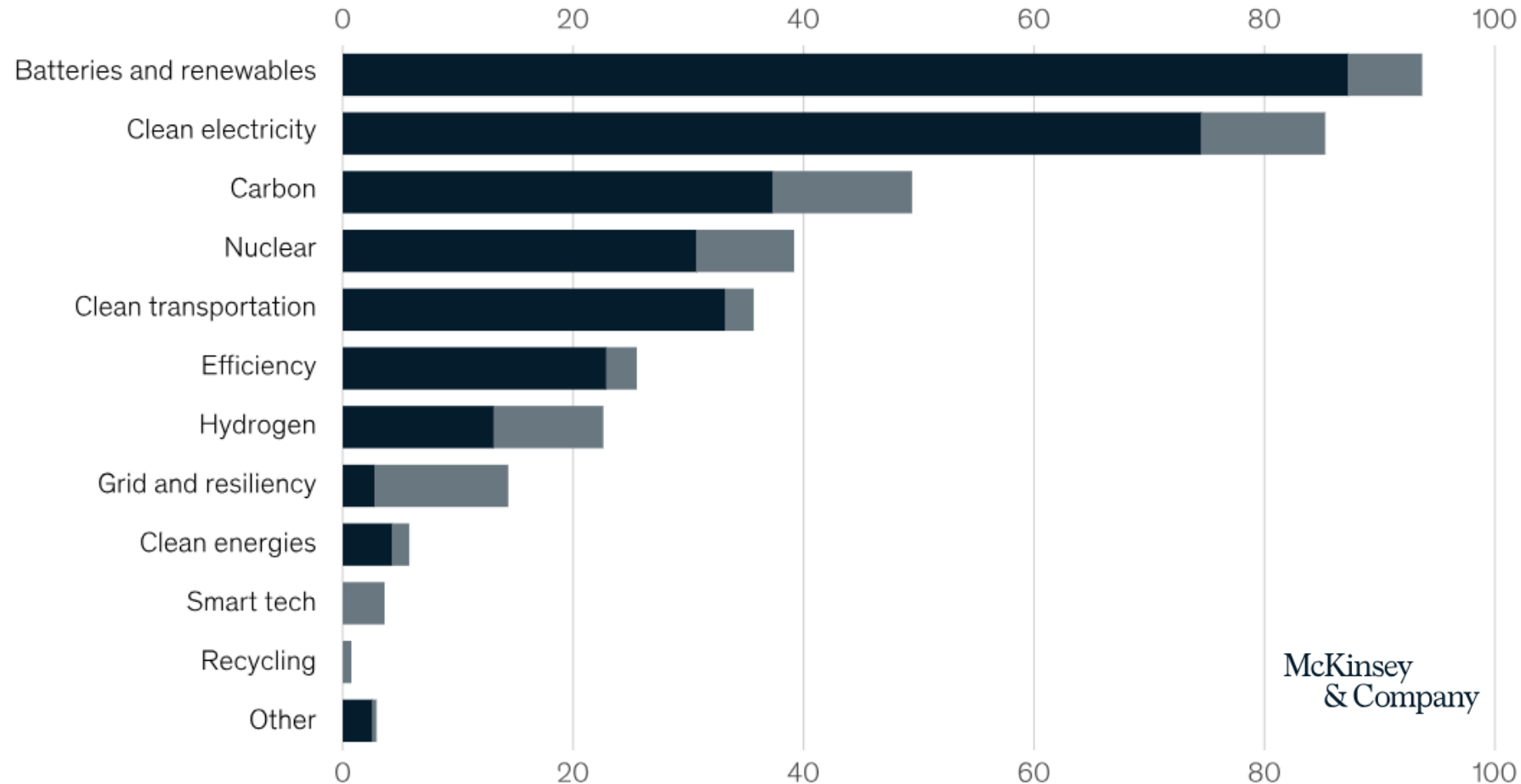
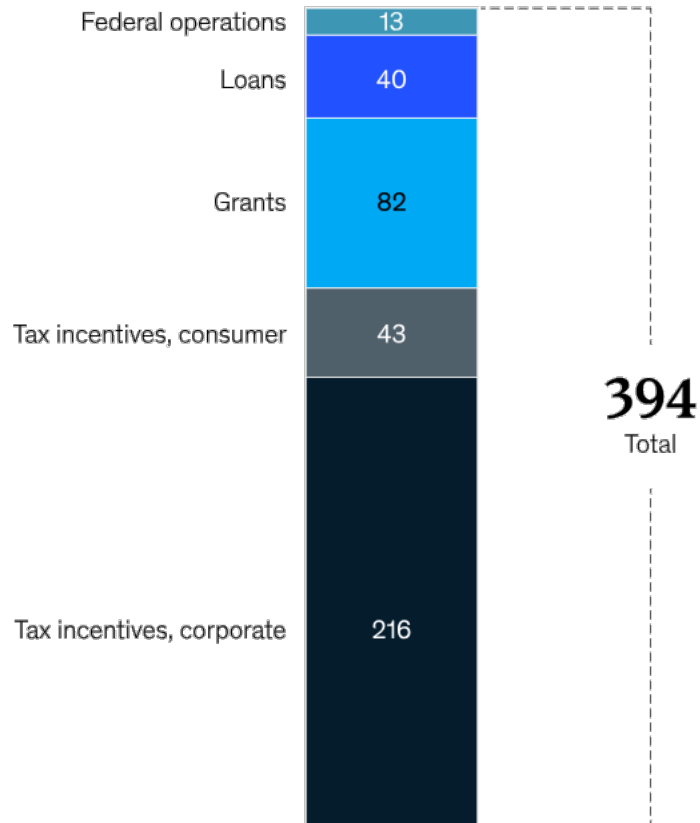
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<https://www.mckinsey.com/industries/public-sector/our-insights/the-inflation-reduction-act-heres-whats-in-it>

Energy funding by theme and source, \$ billion

■ Inflation Reduction Act ■ Bipartisan Infrastructure Law

Energy and climate change funding by type, \$ billion



McKinsey
& Company

Note: This exhibit reflects analysis of the appropriation figures contained in the Inflation Reduction Act, as well as those reported by the Congressional Budget Office and Joint Committee on Taxation. This analysis may differ from other analyses due to differences in methodology.

Source: Inflation Reduction Act of 2022, H.R. 5376, 117th Cong. (2021–22); Infrastructure Investment and Jobs Act, H.R. 3684, 117th Cong. (2021–22)

Inflation Reduction Act

Clean Energy Tax Incentives

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Energy Generation & Carbon Capture	Manufacturing	Vehicles	Fuels
§45, §45Y: Production Tax Credit for Clean Electricity	§48C: Investment Credit for Advanced Energy	§45W: Credit for Qualified Clean Vehicles	§45V: Production Tax Credit for Clean Hydrogen
§48, §48E: Investment Tax Credit for Clean Electricity	§45X: Production Credit for Advanced Manufacturing	§30C: Credit for Alternative Vehicle Refueling Property	§45Z: Production Tax Credit for Clean Fuels
§45Q: Credit for Carbon Oxide Sequestration			
§45U: Production Credit for Nuclear Power			

Adapted from <https://www.irs.gov/pub/irs-pdf/p5817g.pdf>

Bonus tax credits also available for domestic content, low-income, tribal, and energy communities



Federal Legislation

Clean-Energy Manufacturing and Industrial Decarbonization

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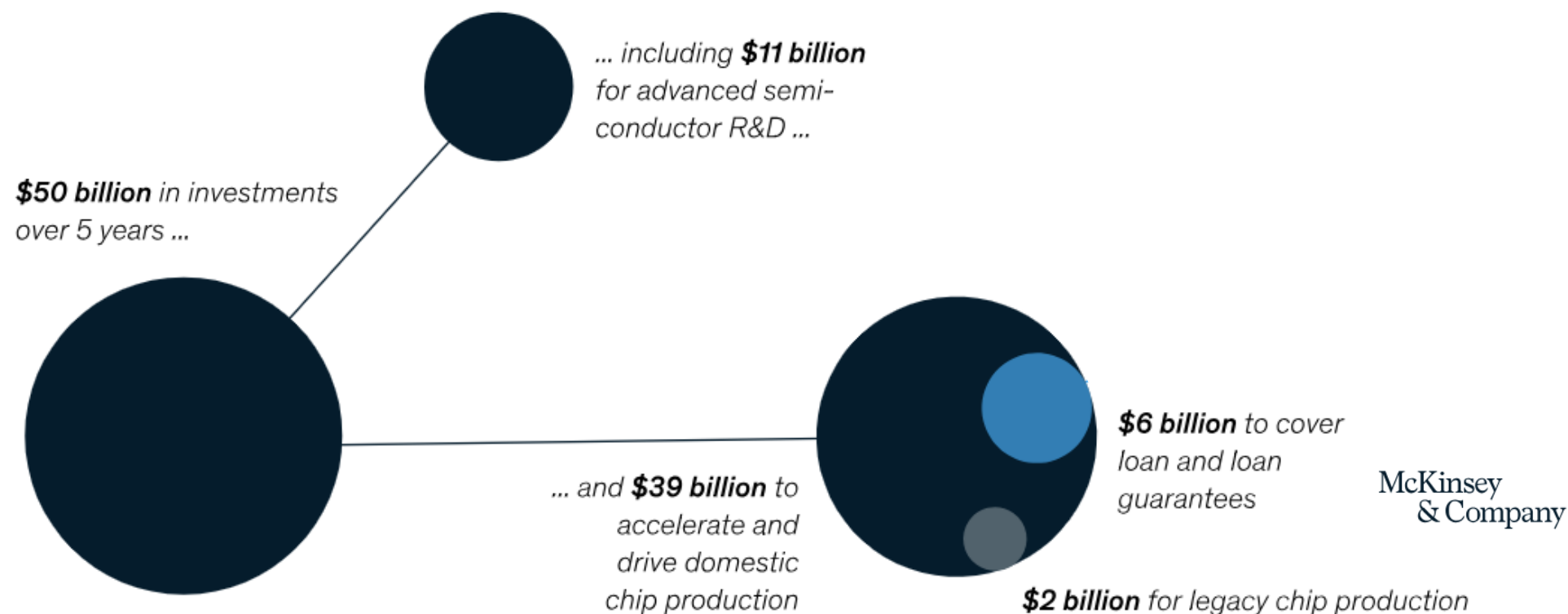
CHIPS & Science Act

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<https://www.mckinsey.com/industries/public-sector/our-insights/the-chips-and-science-act-heres-whats-in-it>

The US Department of Commerce will oversee **\$50 billion** in investments to expand domestic manufacturing of mature and advanced semiconductors.

Budget to expand domestic manufacturing of mature and advanced semiconductors



Source: US Department of Commerce



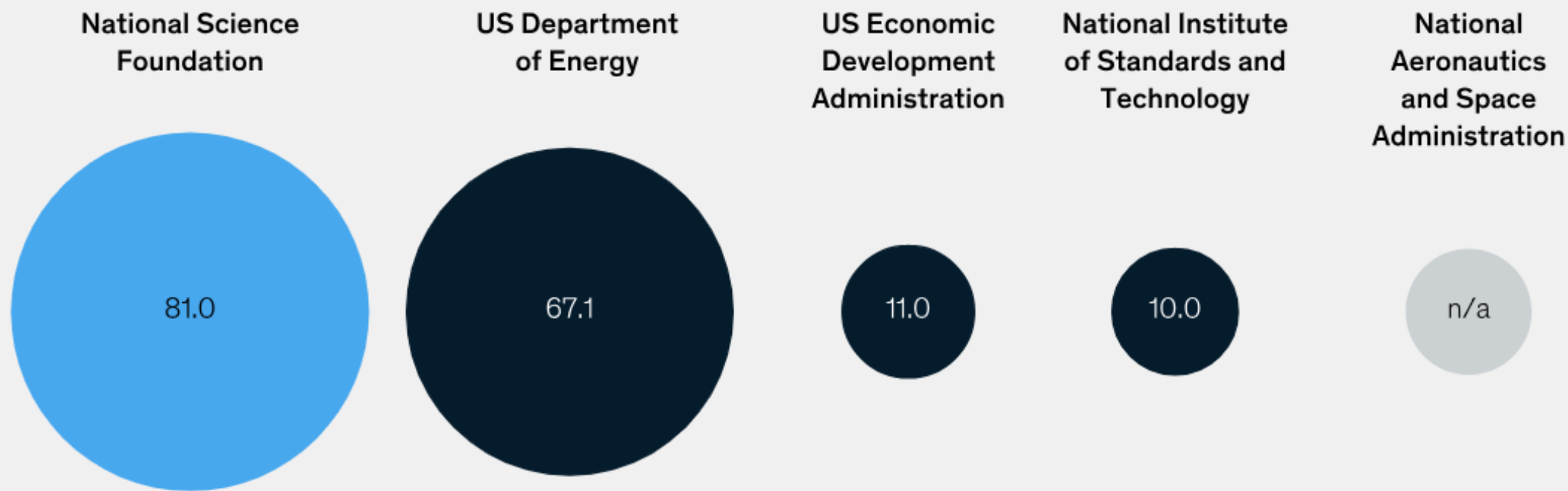
CHIPS & Science Act

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<https://www.mckinsey.com/industries/public-sector/our-insights/the-chips-and-science-act-heres-whats-in-it>

The CHIPS and Science Act authorizes \$174 billion for investment in science, technology, engineering, and math programs, workforce development, and R&D.

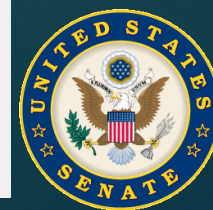
CHIPS and Science Act funding 2022–27,¹ \$ billion



¹Final funding levels subject to future budget appropriations by US Congress.

Source: Congress.gov; Creating Helpful Incentives to Produce Semiconductors (CHIPS) and Science Act of 2022, H.R. 4346, 117th Cong. (2022)

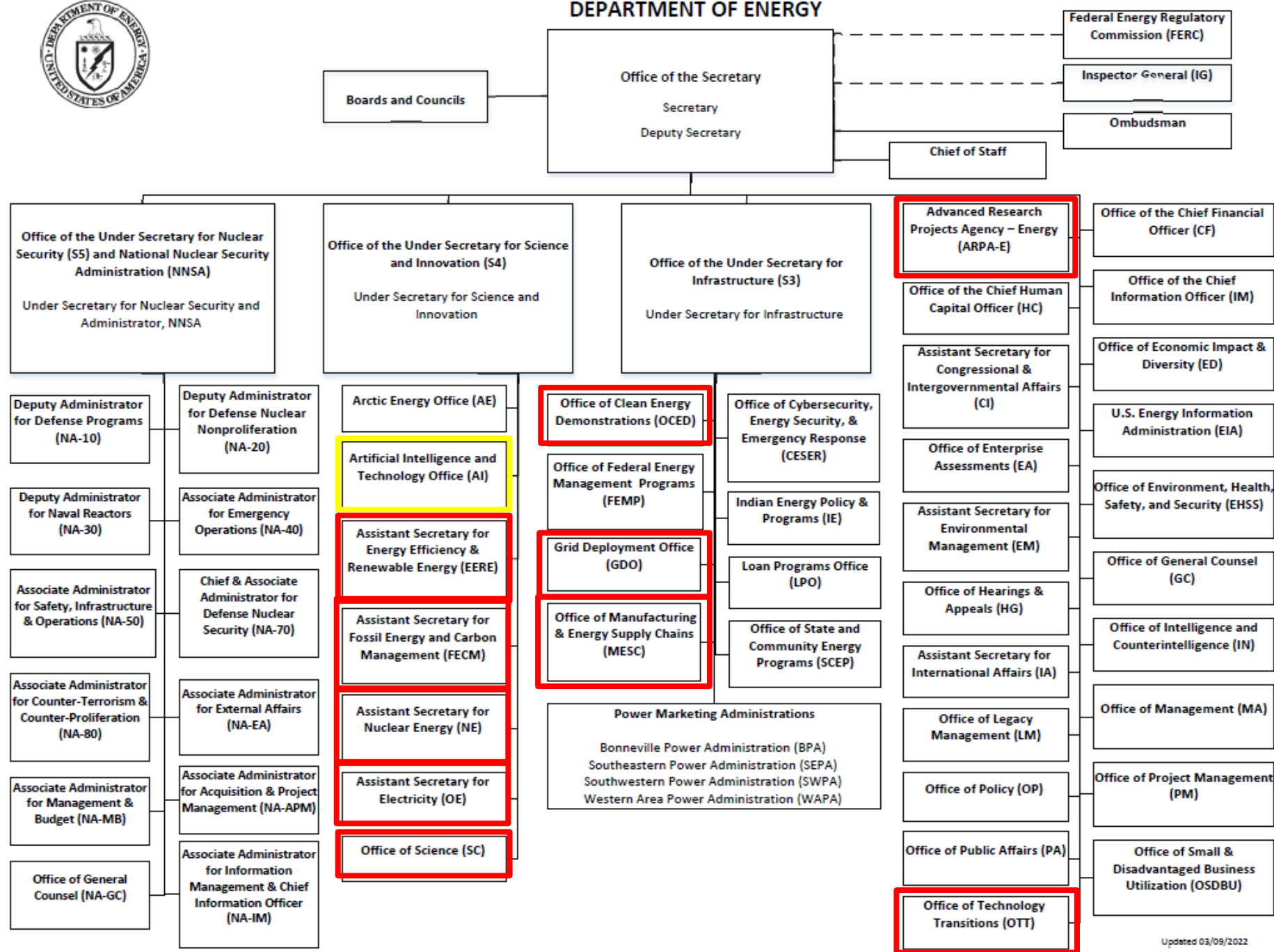
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Funding Implementation – DOE



DEPARTMENT OF ENERGY

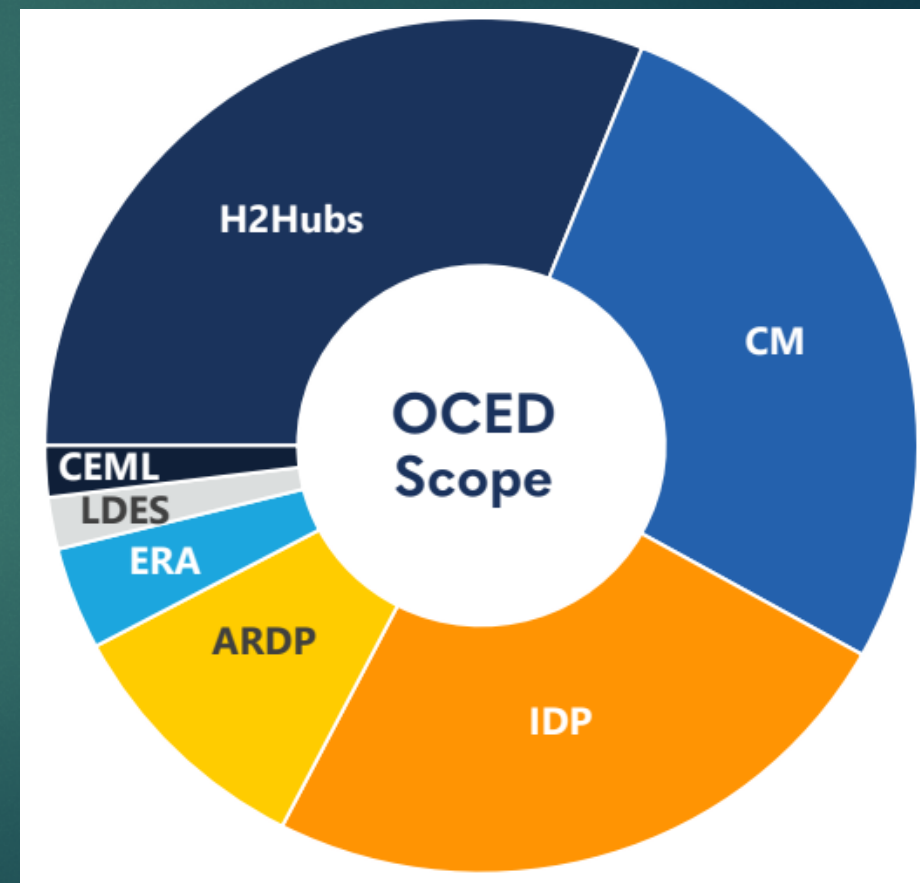
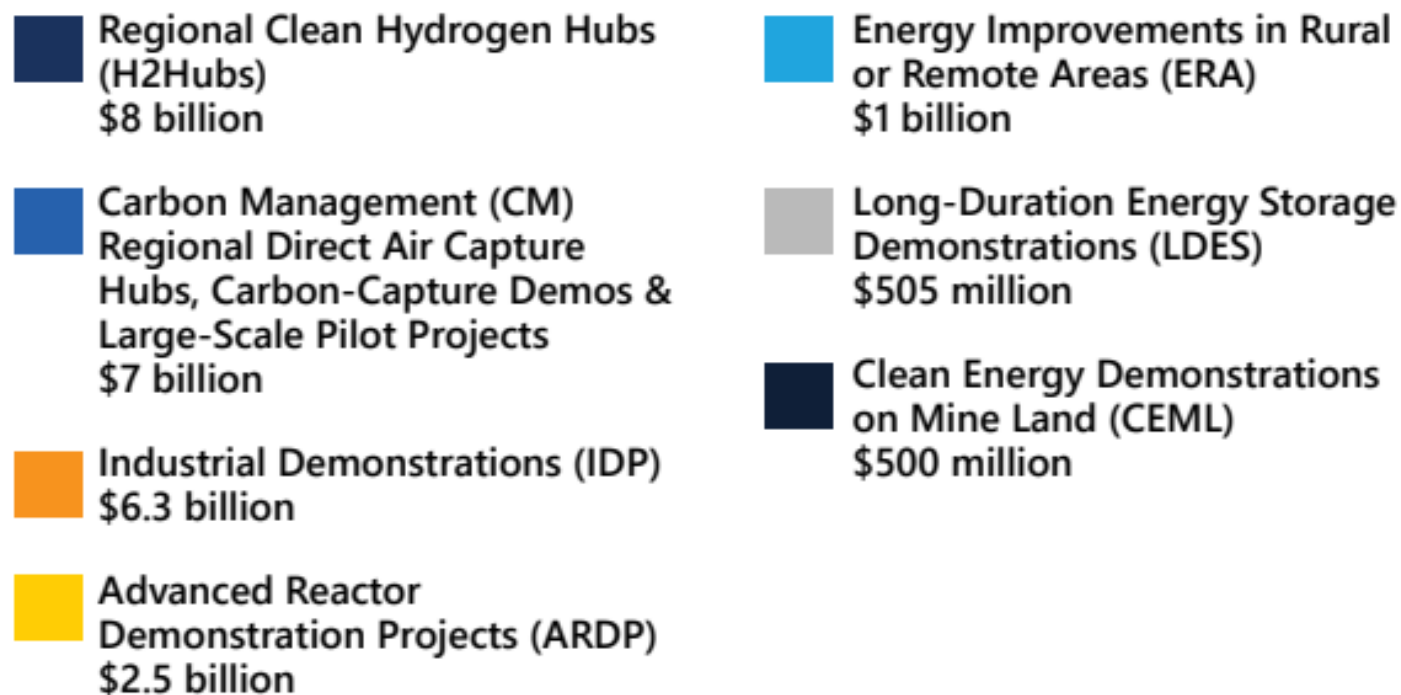


Updated 03/09/2022

Implementation of Federal Funding – OCED (DOE Office of Clean Energy Demonstrations)

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Project Portfolio



DOE ARPA-E

Advanced Research Projects Agency—Energy

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▶ **ROSIE – Revolutionizing Ore to Steel to Impact Emissions**

- ▶ \$35 million to decarbonize domestic iron and steel production
 - ▶ Reduce emissions by 65 metric tons CO₂ annually (1% of U.S. emissions)
- ▶ Two project categories
 - ▶ Novel ironmaking process to produce iron product
 - ▶ Novel ironmaking process to produce steel product



Summary

Summary

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- ▶ Recent federal legislation has authorized and appropriated billions of dollars for clean manufacturing and industrial decarbonization
- ▶ DOE is implementing funding opportunities
- ▶ Congress still needs to appropriate significant amounts of authorized funding



Fellowships

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- ▶ Congressional Fellowships (S&T)
 - ▶ E.g., [AAAS](#), [ACS](#), [ASME](#), [AIP](#), [IEEE](#), [TechCongress](#), [DOE](#)
- ▶ [Presidential Management Fellowships](#)
- ▶ [Presidential Innovation Fellowships](#)





https://en.wikipedia.org/wiki/Authorization_bill#/media/File:CapitalBuilding_Moon_Reflecting_Pool_12x18Print.jpg

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