CLEARPATH

Dynamo - Future Fuels

Powering a Clean Economy with Hydrogen and Ammonia

March 2, 2022

CLEARPATH

What we do

Power

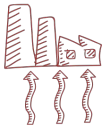

Nuclear


Storage


Natural Gas


Carbon Capture


Hydro


Geothermal

Industrial


Concrete


Metals


Hydrogen

Who we are

Mission: Develop and advance policies that accelerate breakthrough innovations that reduce emissions in the energy and industrial sectors

Policy areas

Federal R&D (basic and applied)

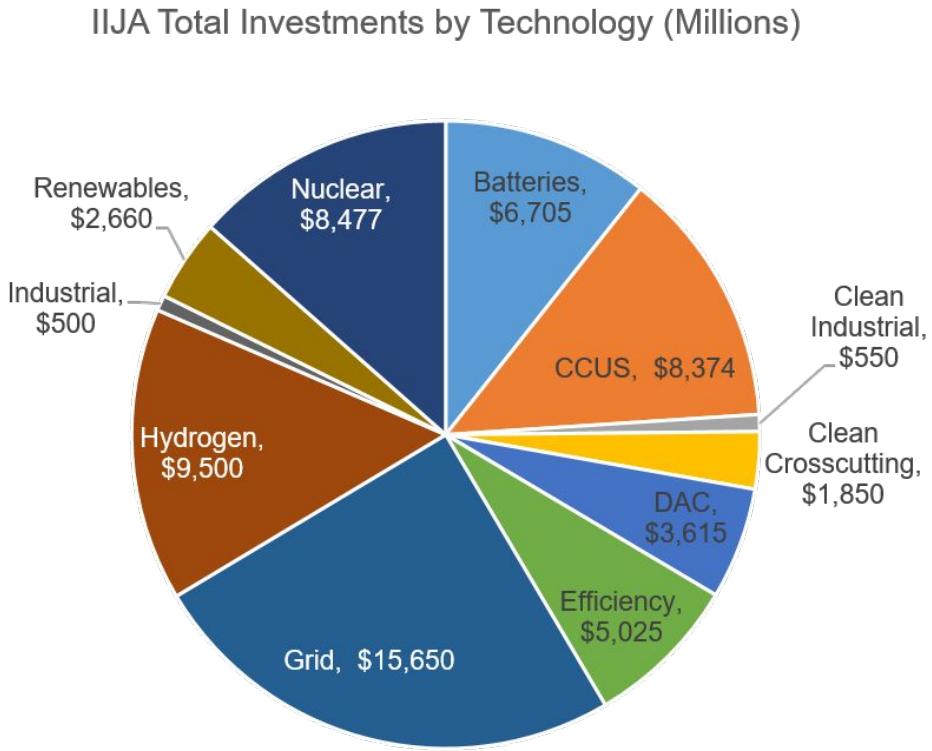
Demonstration Programs

Deployment Incentives

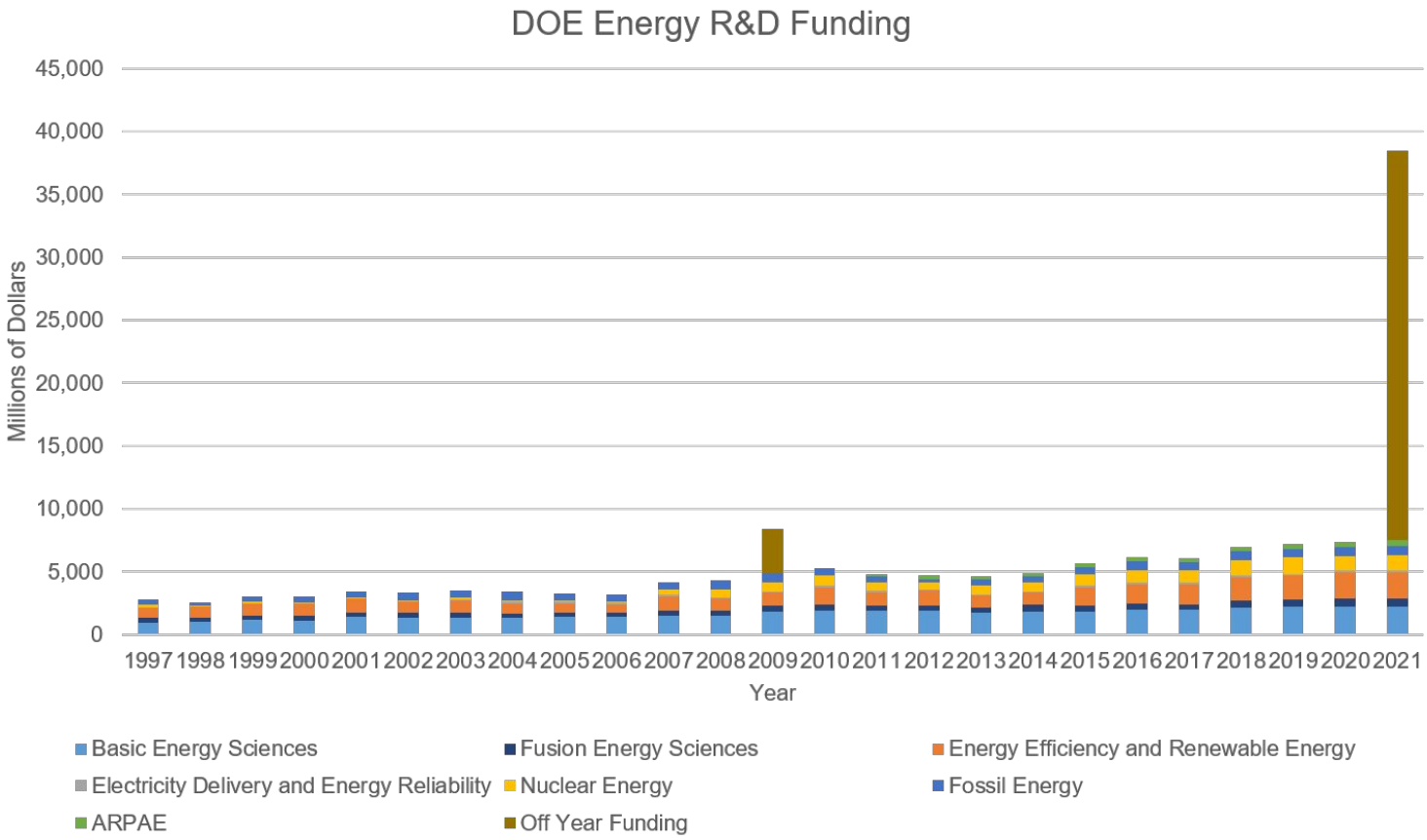
“Ecosystem” e.g. Regulatory Reform

Technology Export and Finance

IIJA Investment by Technology



Scale Can be Difficult to Comprehend



6 Parts to Hydrogen in IIJA

Clean Hydrogen Research and Development Program	Re-establishes and expands DOE's hydrogen office	**Funded through regular appropriations**
Clean Hydrogen Electrolysis Program	Demonstration, commercialization, and deployment of electrolyzer systems	**$1 Billion to Department of Energy**
Clean Hydrogen Manufacturing and Recycling Program	Support a clean hydrogen domestic supply chain	**$0.5 Billion to Department of Energy**
Regional Clean Hydrogen Hubs	Develop at least four large-scale hydrogen production and utilization projects across the country	**$8 Billion to Office of Clean Energy Demos**
Clean Hydrogen Strategy and Roadmap	Directs the development of the first U.S. national strategy to facilitate a clean hydrogen economy	**Funded through regular appropriations**
Clean Hydrogen Production Qualifications	Directs the development of a clean hydrogen production carbon intensity standard	**Funded through regular appropriations**

IIJA: Sec. 40314 Sec 813. Regional Clean Hydrogen Hubs

Regional Hydrogen Hubs

- Demonstrate the production, processing, delivery, storage, and end-use of clean hydrogen.
- Could be developed into a national clean hydrogen network.

Solicitation

180 days after enactment (by May 2022)

Selection

No later than 1 year after solicitation the Secretary shall select **at least 4 regional** hydrogen hubs (by May 2023)

Criteria

- **Feedstock diversity**. Production in at least one of the hubs must be from fossil fuels, nuclear energy, and renewable energy
- **End-use diversity**. End-use in at least one of the hubs must be for power generation, the industrial sector, heating, and transportation
- **Geographic diversity**. Shall be located in different regions, but at least two hubs must be in regions with natural gas resources

Funding

- **$8 billion** is appropriated from **FY 2022 - FY 2026 to OCED**
- No minimum or maximum award value given

45X Hydrogen PTC & ITC (as of 12/14/21)

Credit Level - based on emissions intensity of production

Emissions intensity kgCO2e/kgH2	% of Credit	PTC Credit Base Rate $	PTC Credit 5x Bonus Rate $	ITC Credit 5x Bonus Rate $
4 to 6	15	0.09	0.45	4.5%
2.5 to 4	20	0.12	0.60	6%
1.5 to 2.5	25	0.15	0.75	7.5%
0.45 to 1.5	33.4	0.20	1.00	10%
0.45 and below	100	0.60	3.00	30%

Bonus Rate

- Credit is **increased by 5x** if wage and apprenticeship requirements are met

Double Dip

- Section 45 (RE PTC) **can** be claimed with 45X
- 45J (Nuclear Energy PTC) and 45Q (CCUS) **cannot** be claimed with 45X

Duration

- Construction must begin before 2029
- No credit phase out

Private Sector Developments

Monolith Olive Creek, NE
Methane Pyrolysis H2 Production

Air Products, LA
Natural Gas SMR H2 Production with Carbon Capture

Intermountain Power Project, UT
H2 Electricity Generation with Grid Scale Energy Storage

Hy Stor Energy, MS
Renewable H2 Production and Geologic Storage

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