

Appendix E. Funding Opportunity Announcement Selections

This appendix lists Hydrogen Program Funding Opportunity Announcements (FOAs) and project selections, May 2021–November 2022.

Funding Selection Announcements

The U.S. Department of Energy (DOE) Hydrogen Program has announced the following funding selections since the 2021 Annual Merit Review.

- [\\$52.5 million](#) for 31 projects to accelerate progress in clean hydrogen, jointly funded by the Hydrogen and Fuel Cell Technologies Office (HFTO) and Office of Fossil Energy and Carbon Management (FECM) (July 7, 2021)
- [\\$29 million](#) for 15 projects to advance clean hydrogen production from biomass, blended feedstocks, and natural gas, funded by FECM (August 26, 2022)
- [\\$25 million](#) for 6 projects to develop technologies that will advance the use of clean hydrogen for electricity generation, funded by FECM (May 19, 2022)
- [\\$20 million](#) to demonstrate technology to produce clean hydrogen from nuclear power, jointly funded by HFTO and the Office of Nuclear Energy (NE) (October 7, 2021)
- [Nearly \\$8 million](#) for 9 national laboratory H2@Scale cooperative research and development (CRADA) projects to help reach Hydrogen Shot goals, funded by HFTO (October 6, 2021)
- [\\$4.7 million](#) for 6 projects to advance the development of ceramic-based materials to improve the efficiency of hydrogen-fueled turbines, funded by FECM (September 13, 2022)
- [\\$1.5 million](#) for 5 projects that will advance key clean hydrogen technologies while growing the skills and knowledge of science and engineering students at minority-serving institutions, funded by HFTO through an amendment to an FECM funding opportunity announcement (FOA) (November 10, 2022)
- [\\$4.7 million](#) for 2 concentrating solar thermal power projects that include hydrogen production, funded by the Solar Energy Technologies Office (SETO) (September 27, 2022)
- [\\$76.8 million](#) for 3 SuperTruck 3 projects to develop and demonstrate medium- and heavy-duty hydrogen fuel cell trucks, jointly funded by HFTO (\$60 million) and the Vehicle Technologies Office (VTO) (\$16.8 million) (November 1, 2021)
- [\\$6.2 million](#) for 8 University Turbines Systems Research projects focused on hydrogen combustion for gas turbines, funded by FECM (May 12, 2021)
- [Funding](#) for 11 hydrogen-related chemical and materials sciences research projects to advance clean energy technologies and low-carbon manufacturing, funded by the Basic Energy Sciences (BES) program (August 25, 2022)
- [Funding](#) for 1 hydrogen-related research project through the Energy Frontier Research Centers, funded by BES (August 25, 2022)
- [Funding](#) for 6 hydrogen-related Early Career Research Program projects in Fiscal Year (FY) 2022, funded by the Office of Science (n.d.)
- [Funding](#) for 2 hydrogen-related Early Career Research Program projects in FY 2021, funded by the Office of Science (May 26, 2021)

In addition, HFTO announced winning teams for [H2 Twin Cities](#) and Phase 1 winners of the [Hydrogen Shot Incubator Prize](#), a \$2.6 million competition to foster innovative concepts for producing clean hydrogen.

Table A-1. FY 2022 DOE Hydrogen-Related FOAs and Other Funding Opportunities^a

<p>EERE HFTO</p>	<p>Hydrogen Shot and a University Research Consortium on Grid Resilience (DE-FOA-0002792)</p> <ul style="list-style-type: none"> • HydroGEN: Solar Fuels from Photoelectrochemical and Solar Thermochemical Water Splitting (\$12.5 million) • Development and Validation of Sensor Technology for Monitoring and Measuring of Hydrogen Losses (\$8.0 million) • Materials-Based Hydrogen Storage Demonstrations (\$10.0 million) • M2FCT: High-Performing, Durable, and Low-PGM [platinum group metal] Catalysts/Membrane Electrode Assemblies (MEAs) for Medium- and Heavy-Duty Applications (\$10.0 million) • University Research Consortium on Grid Resilience (URCGR) (\$20.0 million^b) <p style="text-align: right;">HFTO FOA 2792 Announcement</p> <p>H2 Twin Cities</p> <p>H2 Twin Cities is a program under the Clean Energy Ministerial Clean Hydrogen Initiative to accelerate hydrogen progress by incentivizing the pairing of communities around the world to collaborate, share ideas, and learn from each other. These community-level partnerships between cities help connect activities where hydrogen and fuel cell technologies have energy, environmental, and economic benefits.</p> <p style="text-align: right;">HFTO H2 Twin Cities Announcement</p> <p style="text-align: right;">Selections</p> <p>Hydrogen Shot Incubator Prize</p> <p>The Hydrogen Shot Incubator Prize is a \$2.6 million prize for identifying, developing, and testing disruptive technologies to reduce the cost of clean hydrogen production. The Prize supports the Hydrogen Energy Earthshot goal of achieving clean hydrogen production at \$1/kg in one decade.</p> <p style="text-align: right;">HFTO Hydrogen Shot Incubator Prize Announcement</p> <p style="text-align: right;">Selections</p>	
	<p>EERE VTO</p>	<p>Fiscal Year 2022 Vehicle Technologies Office Program-Wide (DE-FOA-0002611)</p> <p>Hydrogen-related topics include:</p> <ul style="list-style-type: none"> • Advanced Opposed Piston 2-Stroke (OP2S) Hydrogen Combustion Architecture for Heavy-Duty Transportation, Including On-Road and Non-Road (Off-Road, Rail, and Marine) Applications (\$5.0 million) • Innovative Medium- and Heavy-Duty Electric Vehicle (EV) Charging and Hydrogen Regional Fueling Corridor Infrastructure Plans (\$2.5 million) • Natural Gas Engine Demonstration for Non-Road, Including Off-Road, Rail, and Marine Applications (\$5.0 million) <p style="text-align: right;">VTO FOA 2611 Announcement</p> <p style="text-align: right;">Selections – Innovative Medium- and Heavy-Duty EV Charging and Hydrogen Regional Fueling Corridor Infrastructure Plans</p>

<p>EERE AMO</p>	<p>Industrial Efficiency and Decarbonization FOA (DE-FOA-0002804)</p> <p>Hydrogen-related topics include:</p> <ul style="list-style-type: none"> • Decarbonizing Iron and Steel • Decarbonizing Cement and Concrete <p style="text-align: right;">AMO FOA 2804 Announcement</p>
<p>EERE SETO</p>	<p>Concentrating Solar Thermal Power Fiscal Year 2022 Research, Development, and Demonstration (DE-FOA-0002630)</p> <p>Hydrogen-related topics include:</p> <ul style="list-style-type: none"> • Concentrating Solar Thermal for Industrial Decarbonization • Concentration Solar Thermal Particle Technologies for Generation 3 CSP [concentrating solar power] and Beyond (Gen3++) <p style="text-align: right;">SETO FOA 2630 Announcement Selections</p>
<p>OCED</p>	<p>Bipartisan Infrastructure Law: Regional Clean Hydrogen Hubs (DE-FOA-0002779)</p> <p>Will fund 6–10 regional clean hydrogen hubs across the country, for a combined total of \$6 billion to \$7 billion dollars in federal funding.</p> <p style="text-align: right;">OCED FOA 2779 Announcement</p>
<p>NE</p>	<p>Fiscal Year 2022 Consolidated Innovative Nuclear Research (DE-FOA-0002516)</p> <p>Hydrogen-related topics include:</p> <ul style="list-style-type: none"> • Implementation Consideration for Alternative Applications of Advanced Nuclear Reactors • Integrated Energy Systems • Developing the Technical Basis and Risk Assessment Tools for Flexible Plant Operation <p style="text-align: right;">FOA 2516 Announcement</p> <p>U.S. Industry Opportunities for Advanced Nuclear Technology Development (DE-FOA-0001817)</p> <p>Hydrogen-related topics include:</p> <ul style="list-style-type: none"> • Nuclear-Coupled Hydrogen Production and Use (\$20 million–\$40 million) <ul style="list-style-type: none"> ○ Nuclear Plant Thermal Integration ○ Hydrogen Coupled End Uses <p style="text-align: right;">NE FOA 1817 Announcement</p>

SC	<p>Chemical and Materials Sciences to Advance Clean Energy Technologies and Low-Carbon Manufacturing (DE-FOA-0002676)</p>
	<p>Hydrogen-related topics include:</p> <ul style="list-style-type: none"> • Carbon-Neutral Hydrogen • Solar-to-Hydrogen Conversion and Chemical-to-Hydrogen Conversion <p style="text-align: right;">SC FOA 2676 Announcement SC FOA 2676 Project Selections</p>
	<p>Energy Frontier Research Centers (DE-FOA-0002653)</p> <p>Hydrogen-related topics include:</p> <ul style="list-style-type: none"> • Carbon-Neutral Hydrogen • Solar-to-Hydrogen Conversion and Chemical-to-Hydrogen Conversion <p style="text-align: right;">SC FOA 2653 Announcement SC FOA 2653 Project Selections</p>
FECM	<p>DOE Early Career Research Program for FY 2022 (DE-FOA-0002821)</p> <p style="text-align: right;">SC FOA 2821 Announcement SC FOA 2821 Project Selections</p>
	<p>Advanced Energy Materials for Hydrogen Turbines for Stationary Power Generation (DE-FOA-2613)</p> <ul style="list-style-type: none"> • Benchmark of Ceramic Matrix Composite Performance with Predicative Modeling (\$0.8 million) • Improvement to Temperature Performance of Ceramic Matrix Composite Materials (\$3.9 million) <p style="text-align: right;">FECM FOA 2613 Announcement FECM FOA 2613 Project Selections</p>
FECM	<p>Clean Hydrogen Production, Storage, Transport, and Utilization to Enable a Net-Zero Carbon Economy (DE-FOA-0002400)</p> <ul style="list-style-type: none"> • Clean Hydrogen Cost Reductions via Process Intensification and Modularization for Hydrogen Shot (\$4.8 million) • Clean Hydrogen from High-Volume Waste Materials and Biomass (\$4.8 million) • Sensors and Controls for Co-Gasification of Waste Plastics in Production of Hydrogen with Carbon Capture (\$1.0 million) • Front-End Engineering Design Studies for Carbon Capture Systems at Domestic Industrial Facilities Producing Hydrogen from Natural Gas (\$18.0 million) • Advanced Air Separation for Low-Cost Hydrogen Production via Modular Gasification (\$5.0 million) • Clean Hydrogen Production and Infrastructure for Natural Gas Decarbonization (up to \$21.0 million) • Technologies for Clean Hydrogen Production and Enabling the Safe and Efficient Transportation of Hydrogen Within the U.S. Natural Gas Pipeline System (\$2.3 million)

	<ul style="list-style-type: none"> Fundamental Research to Enable High-Volume, Long-Term Subsurface Hydrogen Storage (\$6.0 million) <p style="text-align: right;">FECM FOA 2400 Announcement</p> <p>Fossil-Energy-Based Production, Storage, Transport, and Utilization of Hydrogen Approaching Net-Zero or Net-Negative Carbon Emissions (DE-FOA-0002400)</p> <ul style="list-style-type: none"> Front-End Engineering Design Studies for Carbon Capture Systems at Domestic Industrial Facilities Producing Hydrogen from Natural Gas (\$1.4 million) Hydrogen Combustion Systems for Gas Turbines (\$22.0 million) Ammonia Combustion Systems for Gas Turbines (\$6.0 million) <p style="text-align: right;">FECM FOA 2400 Announcement FECM FOA 2400 Project Selections</p>
<p style="text-align: center;">FECM / HFTO</p>	<p>University Training and Research for Fossil Energy and Carbon Management – Minority Serving Institutions (MSIs)^c (DE-FOA-0002598)</p> <ul style="list-style-type: none"> Hydrogen Storage Materials Development PGM-Free Catalysts and Electrodes for Fuel Cells and Electrolyzers Hydrogen Materials Compatibility – RD&D [research, development, and demonstration] and Knowledge and Gap Analysis Decarbonization and Net-Zero Greenhouse Gas Emission Technology R&D [research and development] <p style="text-align: right;">FECM/HFTO FOA 2598 Announcement</p>
<p style="text-align: center;">OTT</p>	<p>Technology Commercialization Fund (TCF) Base Annual Appropriations National Laboratory Call</p> <p>The Office of Technology Transitions (OTT) coordinated with the following DOE program offices to make funding available for 2022: the Office of Nuclear Energy; the Office of Electricity; and the Office of Energy Efficiency and Renewable Energy’s Building Technologies Office, Geothermal Technologies Office, Hydrogen and Fuel Cell Technologies Office, Solar Energy Technologies Office, Water Power Technologies Office, and Wind Energy Technologies Office to make funding available.</p> <ul style="list-style-type: none"> Market Needs Assessment Curation of Intellectual Property Matchmaking Streamlining Lab Processes and/or Requirements Increasing Partnerships with External Commercialization Parties <p style="text-align: right;">OTT TCF Announcement TCF Project Selections</p>

^a Funding shown reflects funds expected to be available; funding is subject to annual appropriations.

^b The URCGR funding will support R&D for multiple technologies, including hydrogen-related technologies.

^c For the topics shown here, HFTO contributed \$1.5 million for an amendment to an existing FECM FOA.

Table A-2. FY 2021 DOE Hydrogen-Related FOAs^a

<p>EERE HFTO</p>	<p>Hydrogen and Fuel Cell RD&D (DE-FOA-0002446)</p> <ul style="list-style-type: none"> Fuel Cell R&D for Heavy-Duty Applications (\$15 million) Efficient and Innovative Hydrogen Production (\$10 million) High-Flow Fueling Applications (\$7 million) Cost and Performance Analysis for Fuel Cells, Hydrogen Production, and Hydrogen Storage (\$4 million) <p>HFTO FOA 2466 Announcement HFTO FOA 2446 Project Selections</p>
<p>EERE VTO</p>	<p>SuperTruck 3 (DE-FOA-0002456)</p> <ul style="list-style-type: none"> Joint SuperTruck FOA with VTO – anticipated HFTO funding of \$60 million over five years (\$5 million in FY 2021 and \$15 million, pending appropriations, in FY 2022) <p>VTO FOA 2456 Announcement VTO FOA 2456 Project Selections</p>
<p>FECM</p>	<p>Fossil-Based Hydrogen Production, Transport, Storage and Utilization (DE-FOA-0002400; FECM with HFTO Collaboration)</p> <ul style="list-style-type: none"> Solid Oxide Electrolysis Cell (SOEC) Technology Development for Hydrogen Production (\$7 million) Advanced Carbon Capture, Utilization, and Storage Systems (\$4 million) Hydrogen Combustion Systems for Gas Turbines – Industrial Class (\$4.5 million) <p>FECM FOA 2400 Announcement FECM FOA 2400 Project Selections</p> <p>University Turbines Systems Research (UTSR) – Focus on Hydrogen Fuels</p> <ul style="list-style-type: none"> Hydrogen Combustion Fundamentals for Gas Turbines (\$3 million) Hydrogen Combustion Applications for Gas Turbines (\$2.4 million) Hydrogen–Air Rotating Detonation Engines (\$1.6 million) <p>FECM FOA Project Selections</p>
<p>NE, EERE HFTO</p>	<p>Hydrogen Production and End-Use Demonstration</p> <ul style="list-style-type: none"> HFTO contribution: \$12 million NE contribution: \$8 million <p>NE/HFTO Project Selections</p>
<p>SC</p>	<p>DOE Early-Career Research Program for FY 2022</p> <p>SC Announcement SC Selection</p>

^a Funding shown reflects funds expected to be available; funding is subject to annual appropriations.