



February 21, 2023

The Honorable Charles Fleischmann  
Chairman  
Subcommittee on Energy and Water  
Development, and Related Agencies  
Committee on Appropriations  
U.S. House of Representatives  
2362-B Rayburn House Office Building  
Washington, DC 20515

The Honorable Marcy Kaptur  
Ranking Member  
Subcommittee on Energy and Water  
Development, and Related Agencies  
Committee on Appropriations  
U.S. House of Representatives  
2362-B Rayburn House Office Building  
Washington, DC 20515

The Honorable Dianne Feinstein  
Chairwoman  
Subcommittee on Energy and Water  
Development, and Related Agencies  
Committee on Appropriations  
U.S. Senate  
188 Dirksen Senate Office Building  
Washington, DC 20510

The Honorable John Kennedy  
Ranking Member  
Subcommittee on Energy and Water  
Development, and Related Agencies  
Committee on Appropriations  
U.S. Senate  
188 Dirksen Senate Office Building  
Washington, DC 20510

Dear Chairman Fleischmann, Chairwoman Feinstein, Ranking Member Kaptur, and Ranking Member Kennedy:

On behalf of the Fuel Cell and Hydrogen Association (FCHEA) and our over 90 member companies representing the full global supply chain of the hydrogen and fuel cell industry, we thank you again for your leadership and efforts in the development and passage of P.L. 117-328, the Consolidated Appropriations Act of 2023. This legislation represents the continued interest in supporting our nation's efforts to support the development of a domestic energy economy, increase job growth, and reach our decarbonization goals.

Hydrogen and fuel cell technologies are being increasingly viewed as essential decarbonization tools across the United States and around the world for a wide range of energy sectors, including transportation, goods and people movement, power generation, energy storage, marine propulsion, aviation, steel and cement production, heating, and other industrial applications. According to the *Road Map to a U.S. Hydrogen Economy* report developed by McKinsey and Company, hydrogen has the potential by 2050 to account for 14-percent of our nation's energy demand, generate 3.5 million jobs, reduce carbon emissions by 16-percent, and reduce nitrogen oxides by 36-percent. This only becomes a reality if we choose to make informed investments and incentives across all sectors of our economy.

It is clear that hydrogen will play a strong role in the broader energy transition and robust annual appropriated funding can provide strong support and encouragement to achieve this goal. It is with your continued support for our industry's growth, we kindly ask that you consider the following requests:

## Office of Energy Efficiency and Renewable Energy Request

### **Proposed Language for Hydrogen and Fuel Cell Technologies Office:**

FCHEA recommends **\$300 million** for Hydrogen and Fuel Cell Technologies to maintain a diverse program which focuses on early, mid, and late-stage research and development, and technology acceleration including market transformation. The program should continue to emphasize hydrogen production and the development of hydrogen refueling infrastructure nationwide to accelerate the adoption of zero-emission fuel cell transportation as imperative. Additionally, regular consultation with industry is recommended to avoid duplication of private-sector activities and ensure retention of fuel cell technology and systems development in the United States.

**H2@Scale:** FCHEA recommends **\$100 million** for continuation of the H2@Scale Initiative to facilitate wide-scale hydrogen production and utilization in the United States, to enable resiliency of power generation and transmission, as well as the advancement of a wide range of industrial processes for the production of fuels, chemicals, and other materials. The H2@Scale program should support high- impact demonstrations and deployments of:

- Stationary fuel cells – including but not limited to microgrids, data centers, telecommunications systems, and backup power;
- Off-road vehicle applications with rail, ports (air and marine), ships, and mining;
- On-road vehicles including light-, medium- and heavy-duty;
- Large-scale hydrogen energy storage, including grid-integration;
- Truck, rail, and pipeline transport improvements for hydrogen;
- Carbon capture, transport, utilization, and storage (CCUS) related to fuel cell use and hydrogen production Hydrogen and natural gas blending;
- Hydrogen for industry, including, but not limited to materials production (e.g. steel and cement), as a clean heat alternative for medium and high heat industrial processes (e.g. paper and pulp), and as a clean chemical feedstock (e.g. ammonia) in coordination with the Advanced Manufacturing Office (AMO); and
- Hydrogen refueling infrastructure along national and state highways to be developed in coordination with the Department of Transportation (DOT).

**Technology Acceleration/Market Transformation:** FCHEA recommends **\$60 million** for Technology Acceleration and market transformation activities. Within available funds **\$40 million** is for industry-led efforts to develop large-scale integrated hydrogen production, transportation, compression, storage, and dispensing, and end-use solutions. Focus should be on scaling-up innovative applications of fuel cell technology, including light-, medium-, and heavy-duty transportation, maritime vehicles, port and drayage equipment, aviation, marine propulsion, locomotives, microgrids and distributed energy resources, unmanned aerial vehicles, hydrogen powered battery electric chargers, hydrogen combustion technologies, and public safety/resiliency. Funding should be made available to support continued fuel cell and hydrogen technical and workforce development and training programs.

**Hydrogen Research and Development:** FCHEA recommends **\$50 million** for Hydrogen Research and Development. The Department shall continue research methods aimed at reducing the cost of hydrogen production, storage, and distribution. This includes novel onboard hydrogen tank systems, trailer delivery systems, and development of systems and equipment for hydrogen pipelines. The Department shall

continue research on reducing cost, increasing durability, and improving the efficiency and performance of critical hydrogen hardware such as measurement devices for fueling stations, hydrogen compressor components, and other hydrogen station dispensing/fueling components (carbon fiber tanks, coolers, leak and purity detectors, nozzles, etc.). Additional emphasis should be put on developing low-pressure, high-density hydrogen storage technologies, as well as hydrogen cooling, transportation, and modeling, including cost-analysis of larger fleets, hydrogen blending, as well as continuing development efforts on varied clean hydrogen production pathways.

**Fuel Cell and Electrolyzer Research and Development:** FCHEA recommends **\$50 million** for Fuel Cell and Electrolyzer Research and Development with a focus on reducing fuel cell and electrolyzer system cost and improving overall system efficiency and durability. Component development and testing should include stack materials, material processing, efficient and cost-effective air compression, operation at low humidification levels and materials that are robust to poor air quality. Electrolyzer research should include operation in fully flooded conditions at differential pressure and at high current densities, as well as development of advanced electrolysis pathways.

**Safety, Codes and Standards:** FCHEA recommends at least **\$30 million** for Safety, Codes, and Standards to maintain a robust program and engage with state and local agencies to support their technical needs relative to hydrogen infrastructure and safety. The Department is also directed to engage on codes and standards for fast-developing fuel cell and hydrogen markets such as heavy-duty trucks, hydrogen appliances, aviation, maritime, locomotives, transportation of hydrogen by rail, hydrogen blending, stationary power, hydrogen pressure vessels, and other areas as needed. The Department is directed to continue coordination and harmonization between U.S. and international standard bodies to ensure there is one set of open (non-proprietary) global standards for fuel cell and hydrogen technologies. Within available funds, funding shall be directed to nationally-accredited codes and standards organizations to accelerate standards, supporting H2@Scale activities, and coordination between U.S. and international standard bodies.

**Workforce Development Training:** FCHEA recommends at least **\$10 million** to support fuel cell and hydrogen technical and workforce development, training programs, and apprenticeships to enable an adequate workforce and long-term employment for further industry needs.

**Hydrogen Education and Disadvantaged Community Support:** FCHEA recommends at least **\$10 million** to support efforts to expand awareness of the safe use of hydrogen for local authorities and regulators. In addition, support should be provided to expand understanding of the benefits that a hydrogen economy can bring specifically to disadvantaged communities.

#### **Proposed Language for Advanced Manufacturing Office:**

At least **\$100 million** in Fiscal Year 2023 appropriations for the Department of Energy's Advanced Manufacturing Office (AMO) to work in coordination with HFTO to support high-impact demonstrations for the development and deployment of:

- Large-scale hydrogen storage and low- and high-temperature electrolyzer supply chain, including porous transport layers/gas diffusion layers, membranes, MEAs, and other components;
- Fuel cell supply chain including stacks, MEAs, balance of plant, and other components;

- Hydrogen infrastructure supply chain including liquid and gaseous hydrogen tanks, compressors, nozzles, hoses, facility improvements for hydrogen safety needs, etc. ;
- Modular distributed on-site hydrogen production; and
- Hydrogen for industry, including, but not limited to materials production (e.g. steel and cement), as a clean heat alternative for medium and high heat industrial processes (e.g. paper and pulp), and as a clean chemical feedstock (e.g. ammonia).

### Office of Fossil Energy Request

#### **Proposed Language FY 2023 for Solid Oxide Fuel Cell Program and Fossil-Based Hydrogen:**

FCHEA recommends not less than **\$160 million** for the research, development, and demonstration of Solid Oxide Fuel Cell (SOFC) systems and fossil-based hydrogen.

The Office of Fossil Energy should continue its efforts on Fossil Energy Based Production, Storage, Transport and Utilization of Hydrogen Approaching Net-Zero or Net-Negative Carbon Emissions begun in 2020. This program includes activities related to: Net-Zero or Negative Carbon Hydrogen Production from Modular Gasification and Co-Gasification of Mixed Wastes, Biomass, and Traditional Feedstocks; Solid Oxide Electrolysis Cell Technology (SOEC) Development; Carbon Capture; Advanced Turbines; Natural Gas-Based Hydrogen Production; Hydrogen Pipeline Infrastructure; and, Subsurface Hydrogen Storage.

Within available funds, include at least **\$50 million** for Solid Oxide Fuel Cell activity. Recognizing the significant progress made in system integration and lifetime extension, this activity builds on the focus of research and development to enable efficient, cost-effective electricity generation with minimal use of water. This can utilize abundant domestic coal and natural gas resources with low or near-zero atmospheric emissions of carbon dioxide and other pollutants. SOFCs are also capable of running on sustainable biogas that can be sourced from agricultural and municipal waste, animal manure, sewage, and more. Moreover, central power generation applications of SOFC can be integrated with carbon capture and storage efforts to contribute to a secure low-carbon energy future. Combined heat and power systems can utilize SOFC waste heat and increase already high efficiencies. Electrolysis cells make hydrogen and oxygen from water and power and reversible electrolysis has developed as a platform for efficient bulk energy storage. This funding will preserve U.S. leadership in SOFC technology and will benefit the economy through retention of high-tech jobs and exports. To ensure timely development of this important technology, which is cost shared with industry, not less than 75% of the total shall be allocated to the SOFC Industry Team.

FCHEA recommends not less than **\$30 million** the Office of Oil and Natural Gas for natural gas utilization research, including conversion of natural gas, natural gas liquids and other gas streams to low-carbon, higher-value products such as chemicals, liquids, and hydrogen. The Committee recognizes and supports the Department's efforts to establish a Natural Gas Utilization Center of Excellence at the National Energy Technology Laboratory, providing leadership in defining the role that natural gas can play in the energy transition.

No less than **\$10 million** is for research to develop hydrogen transportation and storage infrastructure, including the safety, mechanical integrity and regulatory impacts of blending hydrogen into existing natural gas pipelines. Comprehensive planning approaches for transitioning segments of natural gas users

to increased hydrogen use should be part of the program, including analysis of the infrastructure required to transport hydrogen.

#### **Defense Production Act Request:**

FCHEA recommends at least **\$250 million** in fiscal year 2024 appropriations for the Defense Production Act Domestic Clean Energy Accelerator account to provide support for activities using the Defense Production Act at the Department of Energy to accelerate domestic manufacturing of fuel cells, electrolyzers, and platinum group metal catalysts. FCHEA strongly supports the need for ensuring a robust, resilient, and sustainable domestic industrial energy supply chain base to meet the requirements of the clean energy economy as an imperative to strengthening national security, reducing emissions, and creating high quality jobs. Additionally, ensuring a domestic supply of clean energy components to modernize and harden the electrical grid is critical. DOE should provide to the Committee not later than 30 days after enactment of a fiscal year 2024 appropriations bill and prior to the allocation or obligation of funds an execution and spending plan for DPA activities. Further, the DOE should not execute a DPA spending plan or allocate or obligate DPA funds prior to approval by the House and Senate Appropriations Committee.

#### **Department of Energy Coordination Request**

FCHEA requests that the Department of Energy coordinates its efforts in hydrogen energy and fuel cell technologies across its various departments and offices in order to maximize the effectiveness of investments in hydrogen-related activities. This coordination should include at minimum, the Office of Energy Efficiency and Renewable Energy, the Office of Fossil Energy and Carbon Management, the Office of Clean Energy Demonstrations, the Office of Clean Transportation, the Office of Nuclear Energy, the Office of Electricity, the Office of Science, and The Advanced Research Projects Agency – Energy.

Should you wish to discuss these comments further, I can be reached at any time by email at [fwolak@fchea.org](mailto:fwolak@fchea.org) or by phone at (202) 355-9463.

Sincerely,

Frank Wolak  
President & CEO  
Fuel Cell and Hydrogen Energy Association

***CC: House Appropriations Committee Chairwoman Kay Granger and Ranking Member Rosa DeLauro;  
Senate Appropriations Committee Chairwoman Patty Murray and Ranking Member Susan Collins.***