XV. Project Listings by State

California (Continued)

California (Continued)

VII.C.6 California Fuel Cell Partnership: Station Operational Status System (SOSS) 3.0 Implementation, SOSS 3.1 Upgrade, and Station Map Upgrade Project

VII.D.3 Humboldt State University: Dynamic Modeling and Validation of Electrolyzers in Real Time Grid Simulation

VIII.1 Branded by Media: National Codes and Standards Deployment and Outreach

VIII.2 Sandia National Laboratories: R&D for Safety, Codes and Standards: Materials and Components Compatibility

VIII.3 Smart Chemistry: Hydrogen Fuel Quality

VIII.5 Sandia National Laboratory: Hydrogen Quantitative Risk Assessment

VIII.6 Bki: Hydrogen Safety Panel, Safety Knowledge Tools and First Responder Training Resources

VIII.6 City of Santa Fe Springs: Hydrogen Safety Panel, Safety Knowledge Tools and First Responder Training Resources

VIII.6 Fluer, Inc.: Hydrogen Safety Panel, Safety Knowledge Tools and First Responder Training Resources

VIII.10 Sandia National Laboratory: Enabling Hydrogen Infrastructure Through Science-Based Codes and Standards

IX.4 Sandia National Laboratories: Hydrogen Analysis with the Sandia ParaChoice Model

X.3 Sandia National Laboratories: Maritime Fuel Cell Generator Project

Colorado

II.B.1 National Renewable Energy Laboratory: Renewable Electrolysis Integrated System Development and Testing

II.B.1 Spectrum Automation Controls: Renewable Electrolysis Integrated System Development and Testing

II.B.2 National Renewable Energy Laboratory: High-Performance, Long-Lifetime Catalysts for Proton Exchange Membrane Electrolysis

II.C.1 Colorado School of Mines: High Efficiency Solar Thermochemical Reactor for Hydrogen Production

II.C.2 University of Colorado Boulder: Flowing Particle Bed Solarthermal RedOx Process to Split Water

II.C.2 National Renewable Energy Laboratory: Flowing Particle Bed Solarthermal RedOx Process to Split Water

II.C.4 University of Colorado Boulder: NSF/DOE Solar Hydrogen Fuel: Accelerated Discovery of Advanced RedOx Materials for Solar Thermal Water Splitting to Produce Renewable Hydrogen

II.D.1 National Renewable Energy Laboratory: High-Efficiency Tandem Absorbers for Economical Solar Hydrogen Production

II.D.2 National Renewable Energy Laboratory: Wide Bandgap Chalcopyrite Photoelectrodes for Direct Solar Water Splitting

II.E.1 National Renewable Energy Laboratory: Biomass to Hydrogen

III.2 Colorado School of Mines: Fatigue Performance of High-Strength Pipeline Steels and Their Welds in Hydrogen Gas Service

III.9 National Renewable Energy Laboratory: Improved Hydrogen Liquefaction through Heisenberg Vortex Separation of Para- and Orthohydrogen

III.11 National Renewable Energy Laboratory: 700 bar Hydrogen Dispenser Hose Reliability Improvement

III.11 Spectrum Automation Controls: 700 bar Hydrogen Dispenser Hose Reliability Improvement

III.12 National Renewable Energy Laboratory: Cryogenically Flexible, Low Permeability H_2 Delivery Hose

III.14 National Renewable Energy Laboratory: H2FIRST--Consolidation

IV.B.1 National Renewable Energy Laboratory: Hydrogen Storage Engineering Center of Excellence

IV.B.2 National Renewable Energy Laboratory: Hydrogen Storage System Modeling: Public Access, Maintenance, and Enhancements

IV.C.7 National Renewable Energy Laboratory: H_2 Storage Characterization and Optimization Research Efforts

IV.D.5 Composite Technology Development, Inc.: Optimizing the Cost and Performance of Composite Cylinders for H_2 Storage using a Graded Construction

V.A.6 National Renewable Energy Laboratory: Extended Surface Electrocatalyst Development

V.A.6 ALD Nanosolutions: Extended Surface Electrocatalyst Development

Colorado (Continued)

Colorado (Continued)

VIII.7 Bloomfield Automation: NREL Hydrogen Sensor Testing Laboratory

VIII.7 Element One: NREL Hydrogen Sensor Testing Laboratory

IX.7 National Renewable Energy Laboratory: Sustainability Analysis of Hydrogen Supply and Stationary Fuel Cell Systems Using the Hydrogen Regional Sustainability (HyReS) Framework

IX.8 National Renewable Energy Laboratory: Evaluation of Technology Status Compared to Program Targets

IX.9 National Renewable Energy Laboratory: Expanded Capabilities for the Hydrogen Financial Analysis Scenario Tool

IX.11 National Renewable Energy Laboratory: National FCEV and Hydrogen Refueling Station Scenarios

IX.11 Lexidyne, LLC: National FCEV and Hydrogen Refueling Station Scenarios

Connecticut

II.B.3 Proton OnSite: High Performance Platinum Group Metal Free Membrane Electrode Assemblies Through Control of Interfacial Processes

II.B.5 FuelCell Energy: Solid Oxide Based Electrolysis and Stack Technology with Ultra-High Electrolysis Current Density (>3 A/cm^2) and Efficiency

II.B.6 Proton OnSite: Economical Production of Hydrogen Through Development of Novel, High Efficiency Electrocatalysts for Alkaline Membrane Electrolysis

II.B.7 Proton OnSite: New Approaches to Improved PEM Electrolyzer Ion Exchange Membranes

II.F.2 FuelCell Energy: Reformer-Electrolyzer-Purifier (REP) for Production of Hydrogen [CO_2 Pump]

IV.B.1 United Technologies Research Center: Hydrogen Storage Engineering Center of Excellence

V.A.3 FuelCell Energy: Innovative Non-PGM Catalysts for High-Temperature PEMFCs

V.B.7 University of Connecticut: The Effect of Airborne Contaminants on Fuel Cell Performance and Durability

V.B.7 WPCSOL: The Effect of Airborne Contaminants on Fuel Cell Performance and Durability

V.C.3 FuelCell Energy: Smart Matrix Development for Direct Carbonate Fuel Cell

V.C.3 University of Connecticut: Smart Matrix Development for Direct Carbonate Fuel Cell

V.D.3 United Technologies Research Center: Rationally Designed Catalyst Layers for PEMFC Performance Optimization

V.G.6 University of Connecticut: Room Temperature Electrochemical Upgrading of Methane to Oxygenate Fuels

VI.2 Connecticut Center for Advanced Technology: Clean Energy Supply Chain and Manufacturing Competitiveness Analysis for Hydrogen and Fuel Cell Technologies

VII.B.3 Proton OnSite: Validation of an Advanced High Pressure PEM Electrolyzer and Composite Hydrogen Storage, with Data Reporting, for SunHydro Stations

VII.B.3 SunHydro LLC: Validation of an Advanced High Pressure PEM Electrolyzer and Composite Hydrogen Storage, with Data Reporting, for SunHydro Stations

VII.B.5 Proton OnSite: Brentwood Case Study

VIII.6 GWS Solutions of Tolland, LLC: Hydrogen Safety Panel, Safety Knowledge Tools and First Responder Training Resources

VIII.6 Proton OnSite: Hydrogen Safety Panel, Safety Knowledge Tools and First Responder Training Resources

Delaware

V.A.6 University of Delaware: Extended Surface Electrocatalyst Development

V.B.4 University of Delaware: FC-PAD: Ionomer, GDLs, Interfaces

V.C.5 University of Delaware: Highly Stable Anion-Exchange Membranes for High-Voltage Redox-Flow Batteries

Florida

VI.1 Mainstream Engineering: Fuel Cell Membrane Electrode Assembly Manufacturing R&D

VI.6 Mainstream Engineering: In-line Quality Control of PEM Materials

Florida (Continued)

VII.D.3 Florida State University: Dynamic Modeling and Validation of Electrolyzers in Real Time Grid Simulation

VIII.6 Witte Engineered Gases: Hydrogen Safety Panel, Safety Knowledge Tools and First Responder Training Resources

Georgia

II.B.6 Georgia Institute of Technology: Economical Production of Hydrogen Through Development of Novel, High Efficiency Electrocatalysts for Alkaline Membrane Electrolysis

II.E.2 University of Georgia: Sweet Hydrogen: High-Yield Production of Hydrogen from Biomass Sugars Catalyzed by in vitro Synthetic Biosystems

IV.D.3 Center for Transportation and the Environment: Conformable Hydrogen Storage Pressure Vessel Project

V.G.10 Georgia Institute of Technology: Atomic-Scale Design of Metal and Alloy Catalysts: A Combined Theoretical and Experimental Approach

VI.1 Georgia Institute of Technology: Fuel Cell Membrane Electrode Assembly Manufacturing R&D

VII.A.4 Center for Transportation and the Environment: Fuel Cell Hybrid Electric Delivery Van Project

VII.A.4 United Parcel Services: Fuel Cell Hybrid Electric Delivery Van Project

Hawaii

II.D.1 University of Hawaii: High-Efficiency Tandem Absorbers for Economical Solar Hydrogen Production

II.D.2 University of Hawaii: Wide Bandgap Chalcopyrite Photoelectrodes for Direct Solar Water Splitting

IV.C.7 University of Hawaii: H_2 Storage Characterization and Optimization Research Efforts

V.B.7 Hawaii Natural Energy Institute: The Effect of Airborne Contaminants on Fuel Cell Performance and Durability

V.D.2 University of Hawaii: Novel Structured Metal Bipolar Plates for Low Cost Manufacturing

X.1 Hawaii Natural Energy Institute: Hydrogen Energy Systems as a Grid Management Tool

Idaho

VII.D.3 Idaho National Laboratory: Dynamic Modeling and Validation of Electrolyzers in Real Time Grid Simulation

Illinois

II.C.1 Northwestern University: High Efficiency Solar Thermochemical Reactor for Hydrogen Production

III.1 Argonne National Laboratory: Hydrogen Delivery Infrastructure Analysis

III.7 Gas Technology Institute: Compressor-Less Hydrogen Refueling Station Using Thermal Compression

III.13 Argonne National Laboratory: Hydrogen Fueling Station Precooling Analysis

IV.A.1 Argonne National Laboratory: System Analysis of Physical and Materials-Based Hydrogen Storage

IV.C.9 Argonne National Laboratory: High-Capacity and Low-Cost Hydrogen-Storage Sorbents for Automotive Applications

V.A.4 Argonne National Laboratory: Tailored High Performance Low-PGM Alloy Cathode Catalysts

V.A.7 Argonne National Laboratory: Highly Active, Durable, and Ultra-low PGM NSTF Thin Film ORR Catalysts and Supports

V.A.9 Illinois Institute of Technology: Corrosion-Resistant Non-Carbon Electrocatalyst Supports for PEFCs

V.B.1 Argonne National Laboratory: Fuel Cell-Performance and Durability (FC-PAD) Consortium Overview

V.B.2 Argonne National Laboratory: FC-PAD Fuel Cell-Performance and Durability Electrocatalysts and Supports

V.B.3 Argonne National Laboratory: FC-PAD: Electrode Layer Integration

V.B.4 Argonne National Laboratory: FC-PAD: Ionomer, GDLs, Interfaces

V.B.5 Argonne National Laboratory: FC-PAD: Modeling, Evaluation, Characterization

V.C.3 Illinois Institute of Technology: Smart Matrix Development for Direct Carbonate Fuel Cell

V.C.6 Argonne National Laboratory: Advanced Materials for Fully-Integrated MEAs in AEMFCs

Illinois (Continued)

Indiana

Iowa

Kentucky

Maryland

Massachusetts

Massachusetts (Continued)

II.B.4 Giner, Inc.: High Temperature, High Pressure Electrolysis

III.8 GVD Corporation: Advanced Barrier Coatings for Harsh Environments

V.A.3 Northeastern University: Innovative Non-PGM Catalysts for High-Temperature PEMFCs

V.B.4 Tufts University: FC-PAD: Ionomer, GDLs, Interfaces

V.C.4 Giner, Inc.: Ionomer Dispersion Impact on Fuel Cell and Electrolyzer Performance and Durability

V.C.8 Giner, Inc.: Dimensionally Stable High Performance Membranes

V.C.11 ElectroChem, Inc.: Novel Nanocomposite Polymer Electrolyte Membranes for Fuel Cells

V.D.5 Advent Technologies Inc.: Facilitated Direct Liquid Fuel Cells with High Temperature Membrane Electrode Assemblies

V.D.6 Giner, Inc.: Advanced Catalysts and Membrane Electrode Assemblies (MEAs) for Reversible Alkaline Membrane Fuel Cells

V.E.1 Giner, Inc.: Regenerative Fuel Cell System

V.G.9 University of Massachusetts Amherst: Computational Design of Graphene-Nanoparticle Catalysts

VIII.6 Firexplo: Hydrogen Safety Panel, Safety Knowledge Tools and First Responder Training Resources

X.4 Nuvera Fuel Cells: Demonstration of Fuel Cell Auxiliary Power Units (APUs) to Power Transport Refrigeration Units (TRUs) in Refrigerated Trucks

Michigan

IV.B.1 Ford Motor Company: Hydrogen Storage Engineering Center of Excellence

IV.B.1 General Motors Company: Hydrogen Storage Engineering Center of Excellence

IV.B.1 University of Michigan: Hydrogen Storage Engineering Center of Excellence

IV.C.5 University of Michigan: Improving the Kinetics and Thermodynamics of $Mg(BH_4)_2$ for Hydrogen Storage

IV.C.10 University of Michigan: Hydrogen Adsorbents with High Volumetric Density: New Materials and System Projections

IV.C.10 Ford Motor Company: Hydrogen Adsorbents with High Volumetric Density: New Materials and System Projections

IV.D.1 Ford Motor Company: Enhanced Materials and Design Parameters for Reducing the Cost of Hydrogen Storage Tanks

V.A.1 General Motors Company: Non-Precious Metal Fuel Cell Cathodes: Catalyst Development and Electrode Structure Design

V.A.8 General Motors Company: Highly-Accessible Catalysts for Durable High-Power Performance

V.A.9 Nissan Technical Center, North America: Corrosion-Resistant Non-Carbon Electrocatalyst Supports for PEFCs

V.C.1 General Motors Company: New Fuel Cell Membranes with Improved Durability and Performance

V.C.2 Nissan Technical Center, North America: Advanced Hybrid Membranes for Next Generation PEMFC Automotive Applications

V.D.1 General Motors Company: High Performance, Durable, Low Cost Membrane Electrode Assemblies for Transportation Applications

V.D.1 Michigan Technological University: High Performance, Durable, Low Cost Membrane Electrode Assemblies for Transportation Applications

V.G.7 Wayne State University: Nanostructured, Targeted Layered Metal Oxides as Active and Selective Heterogeneous Electrocatalysts for Oxygen Evolution

V.G.8 University of Michigan: Analysis of the Mechanisms of Electrochemical Oxygen Reduction and Development of Ag-alloy and Pt-alloy Electrocatalysis for Low Temperature Fuel Cells

V.G.14 Central Michigan University: Element Specific Atomic Arrangement of Binary and Ternary Alloy Nanosized Catalysts in As-Prepared and Active State

VI.1 General Motors Company: Fuel Cell Membrane Electrode Assembly Manufacturing R&D

VIII.9 Ford Motor Company: Compatibility of Polymeric Materials Used in the Hydrogen Infrastructure

Minnesota

Missouri

Montana

Nebraska

Nevada

New Hampshire

New Jersey

New Mexico

New Mexico (Continued)

New York

New York (Continued)

X.2 Plug Power: Ground Support Equipment Demonstration

X.5 Plug Power: FedEx Express Hydrogen Fuel Cell Extended-Range Battery Electric Vehicles

Ohio

III.4 ACI Services: Hydrogen Compression Application of the Linear Motor Reciprocating Compressor (LMRC)

III.6 N&R Engineering: Low Cost Hydrogen Storage at 875 Bar Using Steel Liner and Steel Wire Wrap

III.12 Swagelok: Cryogenically Flexible, Low Permeability H_2 Delivery Hose

V.E.1 pH Matter, LLC: Regenerative Fuel Cell System

V.F.7 Battelle: Stationary and Emerging Market Fuel Cell System Cost Analysis—Primary Power and Combined Heat and Power Applications

VI.2 Ohio Fuel Cell Coalition: Clean Energy Supply Chain and Manufacturing Competitiveness Analysis for Hydrogen and Fuel Cell Technologies

VI.2 DJW Technology, LLC: Clean Energy Supply Chain and Manufacturing Competitiveness Analysis for Hydrogen and Fuel Cell Technologies

VI.4 GLWN, Westside Industrial Retention & Expansion Network: U.S. Clean Energy Hydrogen and Fuel Cell Technologies: A Competiveness Analysis

VI.4 DJW Technology, LLC: U.S. Clean Energy Hydrogen and Fuel Cell Technologies: A Competiveness Analysis

X.5 Workhorse Technologies Inc.: FedEx Express Hydrogen Fuel Cell Extended-Range Battery Electric Vehicles

Oregon

II.E.3 Oregon State University: Novel Hybrid Microbial Electrochemical System for Efficient Hydrogen Generation from Biomass

III.3 Harris Thermal Transfer Products: Vessel Design and Fabrication Technology for Stationary High-Pressure Hydrogen Storage

III.6 Hy-Performance Materials Testing, LLC: Low Cost Hydrogen Storage at 875 Bar Using Steel Liner and Steel Wire Wrap

IV.B.1 Oregon State University: Hydrogen Storage Engineering Center of Excellence

IV.D.8 Hy-Performance Materials Testing, LLC: Innovative Development, Selection and Testing to Reduce Cost and Weight of Materials for BOP Components

Pennsylvania

II.B.3 Pennsylvania State University: High Performance Platinum Group Metal Free Membrane Electrode Assemblies through Control of Interfacial Processes

II.C.1 Bucknell University: High Efficiency Solar Thermochemical Reactor for Hydrogen Production

II.E.1 Pennsylvania State University: Biomass to Hydrogen

III.3 Temple University: Vessel Design and Fabrication Technology for Stationary High-Pressure Hydrogen Storage

III.5 Temple University: Steel Concrete Composite Vessel for 875 bar Stationary Hydrogen Storage

III.6 CP Industries: Low Cost Hydrogen Storage at 875 Bar Using Steel Liner and Steel Wire Wrap

III.14 PDC Machines: H2FIRST—Consolidation

IV.D.6 PPG Industries: Achieving Hydrogen Storage Goals through High-Strength Fiber Glass

V.A.1 Carnegie Mellon University: Non-Precious Metal Fuel Cell Cathodes: Catalyst Development and Electrode Structure Design

V.A.8 Carnegie Mellon University: Highly-Accessible Catalysts for Durable High-Power Performance

V.A.8 Drexel University: Highly-Accessible Catalysts for Durable High-Power Performance

VII.B.3 Air Products and Chemicals, Inc.: Validation of an Advanced High Pressure PEM Electrolyzer and Composite Hydrogen Storage, with Data Reporting, for SunHydro Stations

VII.C.3 Air Products and Chemicals, Inc.: Advanced Hydrogen Fueling Station Supply: Tube Trailers

Pensylvania (Continued)

VIII.3 ASTM International: Hydrogen Fuel Quality

VIII.3 SAE International: Hydrogen Fuel Quality

VIII.6 Air Products and Chemicals, Inc.: Hydrogen Safety Panel, Safety Knowledge Tools and First Responder Training Resources

South Carolina

II.B.7 Tetramer Technologies, LLC: New Approaches to Improved PEM Electrolyzer Ion Exchange Membranes

II.C.3 Savannah River National Laboratory: Electrolyzer Component Development for the HyS Thermochemical Cycle

II.C.3 Savannah River Consulting LLC: Electrolyzer Component Development for the HyS Thermochemical Cycle

IV.B.1 Savannah River National Laboratory: Hydrogen Storage Engineering Center of Excellence

IV.B.2 Savannah River National Laboratory: Hydrogen Storage System Modeling: Public Access, Maintenance, and Enhancements

IV.B.3 Savannah River National Laboratory: Investigation of Metal and Chemical Hydrides for Hydrogen Storage in Novel Fuel Cell Systems

IV.B.3 Savannah River Consulting LLC: Investigation of Metal and Chemical Hydrides for Hydrogen Storage in Novel Fuel Cell Systems

IV.C.11 Savannah River National Laboratory: Electrochemical Reversible Formation of Alane

VI.5 Savannah River National Laboratory: Continuous Fiber Composite Electrofusion Coupler

Tennessee

III.2 Oak Ridge National Laboratory: Fatigue Performance of High-Strength Pipeline Steels and Their Welds in Hydrogen Gas Service

III.3 Oak Ridge National Laboratory: Vessel Design and Fabrication Technology for Stationary High-Pressure Hydrogen Storage

III.5 Oak Ridge National Laboratory: Steel Concrete Composite Vessel for 875 bar Stationary Hydrogen Storage

III.6 Oak Ridge National Laboratory: Low Cost Hydrogen Storage at 875 Bar Using Steel Liner and Steel Wire Wrap

IV.D.1 AOC, LLC: Enhanced Materials and Design Parameters for Reducing the Cost of Hydrogen Storage Tanks

IV.D.5 Oak Ridge National Laboratory: Optimizing the Cost and Performance of Composite Cylinders for H2 Storage using a Graded Construction

IV.D.7 Oak Ridge National Laboratory: Melt Processable PAN Precursor for High Strength, Low-Cost Carbon Fibers (Phase II)

V.A.1 Oak Ridge National Laboratory: Non-Precious Metal Fuel Cell Cathodes: Catalyst Development and Electrode Structure Design

V.A.4 Oak Ridge National Laboratory: Tailored High Performance Low-PGM Alloy Cathode Catalysts

V.A.7 Oak Ridge National Laboratory: Highly Active, Durable, and Ultra-low PGM NSTF Thin Film ORR Catalysts and Supports

V.B.1 Oak Ridge National Laboratory: Fuel Cell-Performance and Durability (FC-PAD) Consortium Overview

V.B.2 Oak Ridge National Laboratory: FC-PAD Fuel Cell-Performance and Durability Electrocatalysts and Supports

V.B.3 Oak Ridge National Laboratory: FC-PAD: Electrode Layer Integration

V.B.4 Oak Ridge National Laboratory: FC-PAD: Ionomer, GDLs, Interfaces

V.B.5 Oak Ridge National Laboratory: FC-PAD: Modeling, Evaluation, Characterization

V.C.1 Vanderbilt University: New Fuel Cell Membranes with Improved Durability and Performance

V.C.7 Oak Ridge National Laboratory: Advanced Ionomers & MEAs for Alkaline Membrane Fuel Cells

V.F.1 Oak Ridge National Laboratory: New Fuel Cell Materials: Characterization and Method Development

V.G.12 Oak Ridge National Laboratory: Fundamentals of Catalysis and Chemical Transformations

IX.6 University of Tennessee: Policies to Promote Alternative Fuel Vehicles

X.5 Federal Express Corporation: FedEx Express Hydrogen Fuel Cell Extended-Range Battery Electric Vehicles

Texas

III.3 Hanson Pressure Pipe: Vessel Design and Fabrication Technology for Stationary High-Pressure Hydrogen Storage

III.4 Southwest Research Institute®: Hydrogen Compression Application of the Linear Motor Reciprocating Compressor (LMRC)

III.5 Air Liquide: Steel Concrete Composite Vessel for 875 bar Stationary Hydrogen Storage

III.5 Forterra Water Pipe: Steel Concrete Composite Vessel for 875 bar Stationary Hydrogen Storage

IV.C.9 Texas A&M University: High-Capacity and Low-Cost Hydrogen-Storage Sorbents for Automotive Applications

IV.D.3 University of Texas at Austin: Conformable Hydrogen Storage Pressure Vessel Project

V.D.3 University of Texas at Austin: Rationally Designed Catalyst Layers for PEMFC Performance Optimization

V.G.5 Texas A&M University: Modeling Catalyzed Growth of Single Walled Carbon Nanotubes

V.G.11 University of Houston: Dual Site Requirements for Hydrogenoxygenation of Model Biomass Compounds

VI.5 NOV Fiberglass Systems: Continuous Fiber Composite Electrofusion Coupler

VII.A.4 University of Texas at Austin: Fuel Cell Hybrid Electric Delivery Van Project

VII.A.4 Valence Technology: Fuel Cell Hybrid Electric Delivery Van Project

VIII.6 Air Liquide: Hydrogen Safety Panel, Safety Knowledge Tools and First Responder Training Resources

Utah

III.3 MegaStir Technologies LLC: Vessel Design and Fabrication Technology for Stationary High-Pressure Hydrogen Storage

III.5 MegaStir Technologies LLC: Steel Concrete Composite Vessel for 875 bar Stationary Hydrogen Storage

V.G.15 University of Utah: Thermodynamic, Kinetic and Electrochemical Studies on Mixed Proton, Oxygen Ion and Electron (Hole) Conductors

Virginia

II.A.1 Strategic Analysis, Inc.: Hydrogen Pathways Analysis for H_2 Production via a Monolithic Piston Reforming Reactor and Reformer-Electrolyzer-Purifier Technology

II.B.4 Virginia Polytechnic Institute and State University: High Temperature, High Pressure Electrolysis

II.E.2 Virginia Polytechnic Institute and State University: Sweet Hydrogen: High-Yield Production of Hydrogen from Biomass Sugars Catalyzed by in vitro Synthetic Biosystems

III.5 Wiretough Cylinders: Steel Concrete Composite Vessel for 875 bar Stationary Hydrogen Storage

III.6 Wiretough Cylinders: Low Cost Hydrogen Storage at 875 Bar Using Steel Liner and Steel Wire Wrap

III.12 NanoSonic, Inc.: Cryogenically Flexible, Low Permeability H_2 Delivery Hose

IV.A.2 Strategic Analysis, Inc.: Hydrogen Storage Cost Analysis

IV.D.7 Virginia Polytechnic Institute and State University: Melt Processable PAN Precursor for High Strength, Low-Cost Carbon Fibers (Phase II)

V.C.10 NanoSonic, Inc.: Novel Hydrocarbon Ionomers for Durable Proton Exchange Membranes

V.F.6 Strategic Analysis, Inc.: Fuel Cell Vehicle and Bus Cost Analysis

V.F.8 Strategic Analysis, Inc.: A Total Cost of Ownership Model for Design and Manufacturing Optimization of Fuel Cells in Stationary and Emerging Market Applications

V.G.8 Virginia Polytechnic Institute and State University: Analysis of the Mechanisms of Electrochemical Oxygen Reduction and Development of Ag-alloy and Pt-alloy Electrocatalysis for Low Temperature Fuel Cells

VI.3 Virginia Clean Cities at James Madison University: Fuel Cell and Hydrogen Opportunity Center, www.hfcnexus.com

VI.3 Birch Studio: Fuel Cell and Hydrogen Opportunity Center, www.hfcnexus.com

VI.4 Strategic Analysis, Inc.: U.S. Clean Energy Hydrogen and Fuel Cell Technologies: A Competiveness Analysis

VIII.6 Consultant: Hydrogen Safety Panel, Safety Knowledge Tools and First Responder Training Resources

Washington

- II.E.3 Pacific Northwest National Laboratory: Novel Hybrid Microbial Electrochemical System for Efficient Hydrogen Generation from Biomass
- II.F.1 Pacific Northwest National Laboratory: Monolithic Piston-Type Reactor for Hydrogen Production through Rapid Swing of Reforming/Combustion Reactions
- II.F.1 Dason Technology: Monolithic Piston-Type Reactor for Hydrogen Production through Rapid Swing of Reforming/Combustion Reactions
- II.F.1 Washington State University: Monolithic Piston-Type Reactor for Hydrogen Production through Rapid Swing of Reforming/Combustion Reactions
- III.3 Global Engineering and Technology, LLC: Vessel Design and Fabrication Technology for Stationary High-Pressure Hydrogen Storage
- III.5 Global Engineering and Technology, LLC: Steel Concrete Composite Vessel for 875 bar Stationary Hydrogen Storage
- III.9 Washington State University: Improved Hydrogen Liquefaction through Heisenberg Vortex Separation of Para- and Orthohydrogen
- III.10 Pacific Northwest National Laboratory: Magnetocaloric Hydrogen Liquefaction
- III.10 Emerald Energy NW LLC: Magnetocaloric Hydrogen Liquefaction
- IV.B.1 Pacific Northwest National Laboratory: Hydrogen Storage Engineering Center of Excellence
- IV.B.2 Pacific Northwest National Laboratory: Hydrogen Storage System Modeling: Public Access, Maintenance, and Enhancements
- IV.C.7 Pacific Northwest National Laboratory: H_2 Storage Characterization and Optimization Research Efforts
- IV.D.1 Pacific Northwest National Laboratory: Enhanced Materials and Design Parameters for Reducing the Cost of Hydrogen Storage Tanks
- IV.D.6 Pacific Northwest National Laboratory: Achieving Hydrogen Storage Goals through High-Strength Fiber Glass
- V.G.4 Pacific Northwest National Laboratory: Multifunctional Catalysis to Synthesize and Utilize Energy Carriers
- V.G.13 Washington State University: Sub Nanometer Sized Clusters for Heterogeneous Catalysis
- VIII.6 Pacific Northwest National Laboratory: Hydrogen Safety Panel, Safety Knowledge Tools and First Responder Training Resources
- VIII.6 Excelsior Design, Inc.: Hydrogen Safety Panel, Safety Knowledge Tools and First Responder Training Resources
- VIII.9 Pacific Northwest National Laboratory: Compatibility of Polymeric Materials Used in the Hydrogen Infrastructure
- X.4 Pacific Northwest National Laboratory: Demonstration of Fuel Cell Auxiliary Power Units (APUs) to Power Transport Refrigeration Units (TRUs) in Refrigerated Trucks

Washington, D.C.

- VI.3 Breakthrough Technologies Institute: Fuel Cell and Hydrogen Opportunity Center, www.hfcnexus.com
- VII.B.5 Werken: Brentwood Case Study
- VIII.8 Fuel Cell & Hydrogen Energy Association: Fuel Cell & Hydrogen Energy Association Codes and Standards Support

Wisconsin

- V.G.10 University of Wisconsin-Madison: Atomic-Scale Design of Metal and Alloy Catalysts: A Combined Theoretical and Experimental Approach

Foreign Countries

Canada

- II.B.5 Versa Power Systems, Ltd.: Solid Oxide Based Electrolysis and Stack Technology with Ultra-High Electrolysis Current Density (>3 A/cm^2) and Efficiency

Canada (Continued)

Finland

France

Germany

Japan

South Korea

Switzerland

United Kingdom