
XVI. Project Listings by State

Alabama

- IV.E.3 University of Alabama: Novel Carbon(C)-Boron(B)-Nitrogen(N)-Containing H₂ Storage Materials IV-140
- IV.F.4 Toray Composites America: Synergistically Enhanced Materials and Design Parameters for Reducing the Cost of Hydrogen Storage Tanks IV-171

Arizona

- VI.3 Arizona State University: Adaptive Process Controls and Ultrasonics for High-Temperature PEM MEA Manufacture VI-17

Arkansas

- II.C.5 University of Arkansas at Little Rock: Metal Oxide Semiconductor Nanotubular Arrays for Photoelectrochemical Hydrogen Generation II-89

California

- II.B.2 Science Applications International Corporation: Solar High-Temperature Water-Splitting Cycle with Quantum Boost II-48
- II.B.2 Thermochemical Engineering Solutions: Solar High-Temperature Water-Splitting Cycle with Quantum Boost II-48
- II.B.2 University of California, San Diego: Solar High-Temperature Water-Splitting Cycle with Quantum Boost. II-48
- II.B.4 Sandia National Laboratories: Solar Hydrogen Production with a Metal Oxide-Based Thermochemical Cycle. II-62
- II.C.4 Lawrence Livermore National Laboratory: Characterization and Optimization of Photoelectrode Surfaces for Solar-to-Chemical Fuel Conversion II-84
- II.C.5 University of Nevada, Reno: Metal Oxide Semiconductor Nanotubular Arrays for Photoelectrochemical Hydrogen Generation II-89
- II.C.7 California Institute of Technology: Next-Generation Si Microwire Array Devices for Unassisted Photoelectrosynthesis. II-97
- II.D.1 University of California, Berkeley: Maximizing Light Utilization Efficiency and Hydrogen Production in Microalgal Cultures II-101
- II.D.4 J. Craig Venter Institute: Hydrogen from Water in a Novel Recombinant Oxygen-Tolerant Cyanobacterial System. II-113
- III.5 Sandia National Laboratories: Hydrogen Embrittlement of Structural Steels III-29
- III.7 Ben C. Gerwick Inc.: Vessel Design and Fabrication Technology for Stationary High-Pressure Hydrogen Storage. III-37
- III.8 Lawrence Livermore National Laboratory: Rapid High-Pressure Liquid Hydrogen Refueling for Maximum Range and Dormancy. III-42
- III.8 Linde LLC: Rapid High-Pressure Liquid Hydrogen Refueling for Maximum Range and Dormancy. III-42
- III.9 Sandia National Laboratories: Polymer and Composite Material Performance in Hydrogen III-46
- III.10 HyGen Industries: Development of a Centrifugal Hydrogen Pipeline Gas Compressor III-48
- IV.A.3 H₂ Technology Consulting LLC: Best Practices for Characterizing Engineering Properties of Hydrogen Storage Materials IV-24
- IV.B.1 Jet Propulsion Laboratory: Hydrogen Storage Engineering Center of Excellence. IV-29
- IV.B.1 California Institute of Technology: Hydrogen Storage Engineering Center of Excellence IV-29
- IV.C.1 H₂ Technology Consulting LLC: Hydrogen Sorbent Measurement Qualification and Characterization IV-80
- IV.C.2 HRL Laboratories, LLC: Room Temperature Hydrogen Storage in Nano-Confined Liquids IV-84

California (Continued)

IV.C.3	Lawrence Berkeley National Laboratory: Hydrogen Storage in Metal-Organic Frameworks	IV-89
IV.D.1	California Institute of Technology: Design of Novel Multi-Component Metal Hydride-Based Mixtures for Hydrogen Storage	IV-112
V.A.2	Stanford University: Extended, Continuous Pt Nanostructures in Thick, Dispersed Electrodes.	V-14
V.A.3	Jet Propulsion Laboratory: Nanosegregated Cathode Catalysts with Ultra-Low Platinum Loading	V-19
V.A.5	University of California, Riverside: The Science and Engineering of Durable Ultra-Low PGM Catalysts . . .	V-31
V.C.1	Lawrence Berkeley National Laboratory: High-Performance, Durable, Low-Cost Membrane Electrode Assemblies for Transportation Applications	V-90
V.D.1	Lawrence Berkeley National Laboratory: Durability Improvements through Degradation Mechanism Studies	V-98
V.D.3	Lawrence Berkeley National Laboratory: Accelerated Testing Validation.	V-109
V.F.1	Lawrence Berkeley National Laboratory: Fuel Cell Fundamentals at Low and Subzero Temperatures	V-141
V.F.4	Lawrence Berkeley National Laboratory: Transport Studies Enabling Efficiency Optimization of Cost-Competitive Fuel Cell Stacks	V-159
V.G.3	Electricore, Inc.: Roots Air Management System with Integrated Expander	V-170
V.H.5	University of California, Irvine: Enlarging the Potential Market for Stationary Fuel Cells Through System Design Optimization	V-199
V.H.7	Lawrence Berkeley National Laboratory: A Total Cost of Ownership Model for Design and Manufacturing Optimization of Fuel Cells in Stationary and Emerging Market Applications	V-207
V.H.7	University of California, Berkeley: A Total Cost of Ownership Model for Design and Manufacturing Optimization of Fuel Cells in Stationary and Emerging Market Applications	V-207
V.N.9	University of Southern California, Los Angeles: Nanoporous Membranes for Hydrogen Production: Experimental Studies and Molecular Simulations	V-273
V.N.16	University of California, Santa Barbara: Platinum-Group Metal (PGM) Substituted Complex Oxide Catalysts	V-298
VI.6	Quantum Fuel Systems Technologies Worldwide, Inc.: Development of Advanced Manufacturing Technologies for Low-Cost Hydrogen Storage Vessels	VI-30
VII.11	Linde LLC: Performance Evaluation of Delivered Hydrogen Fueling Stations	VII-45
VIII.4	Sandia National Laboratories: R&D for Safety, Codes and Standards: Materials and Components Compatibility	VIII-22
VIII.6	Sandia National Laboratories: R&D for Safety Codes and Standards: Hydrogen Release Behavior.	VIII-33
VIII.7	Sandia National Laboratories: R&D for Safety Codes and Standards: Risk Assessment	VIII-39
VIII.8	California Fuel Cell Partnership: Hydrogen Emergency Response Training for First Responders	VIII-43
VIII.9	Fluer, Inc. : Hydrogen Safety Panel and Hydrogen Safety Knowledge Tools	VIII-46
VIII.9	City of Santa Fe Springs: Hydrogen Safety Panel and Hydrogen Safety Knowledge Tools	VIII-46
VIII.10	Zero Carbon Energy Solutions: International Partnership for Hydrogen & Fuel Cells in the Economy - Regulations Codes and Standards Working Group	VIII-51
IX.1	Oorja Protonics, Inc.: Direct Methanol Fuel Cell Material Handling Equipment Deployment	IX-7
X.1	Electricore, Inc.: Solid Oxide Fuel Cell Diesel Auxiliary Power Unit Demonstration.	X-7
X.2	ClearEdge Power: Highly Efficient, 5-kW CHP Fuel Cells Demonstrating Durability and Economic Value in Residential and Light Commercial Applications	X-10
X.4	Altery Systems: Use of 72-Hour Hydrogen PEM Fuel Cell Systems to Support Emergency Communications	X-16
XI.2	University of California: Siting Strategies for Early H2 Refueling Infrastructure in California: Learning from the Gasoline Experience	XI-17
XI.3	University of California: Design and Economics of an Early Hydrogen Refueling Network for California	XI-21

California (Continued)

XI.9	Sandia National Laboratories: Global Hydrogen Resource Analysis	XI-44
------	---	-------

Colorado

II.A.2	National Renewable Energy Laboratory: Renewable Electrolysis Integrated Systems Development and Testing	II-15
II.A.2	Spectrum Automation Controls: Renewable Electrolysis Integrated Systems Development and Testing	II-15
II.B.3	University of Colorado: Solar-Thermal Redox-Based Water Splitting Cycles	II-57
II.B.4	University of Colorado: Solar Hydrogen Production with a Metal Oxide-Based Thermochemical Cycle	II-62
II.B.4	Colorado School of Mines: Solar Hydrogen Production with a Metal Oxide-Based Thermochemical Cycle	II-62
II.C.1	National Renewable Energy Laboratory: Semiconductor Materials for Photoelectrolysis.	II-70
II.C.2	MVSystems, Incorporated: Photoelectrochemical Hydrogen Production	II-75
II.C.3	National Renewable Energy Laboratory: Critical Research for Cost-Effective Photoelectrochemical Production of Hydrogen	II-79
II.C.5	National Renewable Energy Laboratory: Metal Oxide Semiconductor Nanotubular Arrays for Photoelectrochemical Hydrogen Generation	II-89
II.D.2	National Renewable Energy Laboratory: Biological Systems for Hydrogen Photoproduction	II-105
II.D.3	National Renewable Energy Laboratory: Fermentation and Electrohydrogenic Approaches to Hydrogen Production	II-108
II.D.5	National Renewable Energy Laboratory: Probing O ₂ -Tolerant CBS Hydrogenase for Hydrogen Production	II-116
II.E.1	National Renewable Energy Laboratory: Distributed Bio-Oil Reforming	II-119
III.8	Engineering, Procurement & Construction : Rapid High-Pressure Liquid Hydrogen Refueling for Maximum Range and Dormancy	III-42
IV.B.1	National Renewable Energy Laboratory: Hydrogen Storage Engineering Center of Excellence.	IV-29
IV.B.5	National Renewable Energy Laboratory: System Design, Analysis, Modeling, and Media Engineering Properties for Hydrogen Energy Storage	IV-57
IV.C.1	National Renewable Energy Laboratory: Hydrogen Sorbent Measurement Qualification and Characterization	IV-80
IV.C.6	National Renewable Energy Laboratory: Weak Chemisorption Validation	IV-103
V.A.2	National Renewable Energy Laboratory: Extended, Continuous Pt Nanostructures in Thick, Dispersed Electrodes	V-14
V.A.2	Colorado School of Mines: Extended, Continuous Pt Nanostructures in Thick, Dispersed Electrodes	V-14
V.A.7	National Renewable Energy Laboratory: Tungsten Oxide and Heteropoly Acid-Based Systems for Ultra-High Activity and Stability of Pt Catalysts in PEM Fuel Cell Cathodes.	V-44
V.A.7	Colorado School of Mines: Tungsten Oxide and Heteropoly Acid-Based Systems for Ultra-High Activity and Stability of Pt Catalysts in PEM Fuel Cell Cathodes	V-44
V.A.7	University of Colorado, Boulder: Tungsten Oxide and Heteropoly Acid-Based Systems for Ultra-High Activity and Stability of Pt Catalysts in PEM Fuel Cell Cathodes	V-44
V.D.4	National Renewable Energy Laboratory: Analysis of Laboratory Fuel Cell Technology Status – Voltage Degradation	V-116
V.E.1	National Renewable Energy Laboratory: Effect of System Contaminants on PEMFC Performance and Durability	V-129
V.E.1	Colorado School of Mines: Effect of System Contaminants on PEMFC Performance and Durability	V-129
V.H.5	National Renewable Energy Laboratory: Enlarging the Potential Market for Stationary Fuel Cells Through System Design Optimization	V-199
V.L.1	National Renewable Energy Laboratory: Advanced Ionomers and MEAs for Alkaline Membrane Fuel Cells	V-235

Colorado (Continued)

V.L.1	Colorado School of Mines: Advanced Ionomers and MEAs for Alkaline Membrane Fuel Cells	V-235
VI.1	National Renewable Energy Laboratory: Fuel Cell Membrane Electrode Assembly Manufacturing R&D	VI-7
VII.1	National Renewable Energy Laboratory: Technology Validation: Fuel Cell Bus Evaluations	VII-7
VII.2	National Renewable Energy Laboratory: Stationary Fuel Cell Evaluation	VII-11
VII.4	National Renewable Energy Laboratory: Hydrogen Component Validation	VII-18
VII.4	Spectrum Automation Controls: Hydrogen Component Validation	VII-18
VII.5	Proton OnSite: Validation of an Advanced High-Pressure PEM Electrolyzer and Composite Hydrogen Storage, with Data Reporting, for SunHydro Stations	VII-22
VII.6	National Renewable Energy Laboratory: Forklift and Backup Power Data Collection and Analysis	VII-26
VII.7	National Renewable Energy Laboratory: Fuel Cell Electric Vehicle Evaluation	VII-32
VII.8	National Renewable Energy Laboratory: Next Generation Hydrogen Infrastructure Evaluation	VII-36
VII.9	California Air Resources Board: Data Collection and Validation of Newport Beach Hydrogen Station Performance	VII-41
VII.10	California State University, Los Angeles: California State University Los Angeles Hydrogen Refueling Facility Performance Evaluation and Optimization	VII-43
VII.11	Gas Technology Institute: Performance Evaluation of Delivered Hydrogen Fueling Stations	VII-45
VIII.1	National Renewable Energy Laboratory: Fuel Cell Technologies National Codes and Standards Development and Outreach	VIII-7
VIII.2	National Renewable Energy Laboratory: Component Standard Research and Development	VIII-11
VIII.11	National Renewable Energy Laboratory: NREL Hydrogen Sensor Testing Laboratory	VIII-55
IX.1	National Renewable Energy Laboratory: Direct Methanol Fuel Cell Material Handling Equipment Deployment	IX-7
IX.7	National Renewable Energy Laboratory: Hawaii Hydrogen Initiative (H2I) Financial Scenario Analysis	IX-30
X.1	TDA Research, Inc.: Solid Oxide Fuel Cell Diesel Auxiliary Power Unit Demonstration	X-7
XI.7	National Renewable Energy Laboratory: Pathway Analysis: Projected Cost, Well-to-Wheels Energy Use and Emissions of Current Hydrogen Technologies	XI-36
XI.8	National Renewable Energy Laboratory: Hydrogen from Biogas: Resource Assessment	XI-40
XI.11	National Renewable Energy Laboratory: Analysis of Fuel Cell Integration with Biofuels Production	XI-51
XI.12	National Renewable Energy Laboratory: Analysis of Community Energy	XI-56

Connecticut

II.A.3	Proton OnSite: High-Performance, Low-Cost Hydrogen Generation from Renewable Energy	II-18
II.A.4	Proton OnSite: Low-Cost Large-Scale PEM Electrolysis for Renewable Energy Storage	II-22
II.A.5	Proton OnSite: Economical Production of Hydrogen through Development of Novel, High Efficiency Electrocatalysts for Alkaline Membrane Electrolysis	II-26
II.A.7	Proton OnSite: Hydrogen by Wire - Home Fueling System	II-35
II.A.8	Proton OnSite: Low-Noble-Metal-Content Catalysts/Electrodes for Hydrogen Production by Water Electrolysis	II-39
III.6	FuelCell Energy, Inc.: Electrochemical Hydrogen Compressor	III-33
III.6	Sustainable Innovations, LLC: Electrochemical Hydrogen Compressor	III-33
IV.B.1	United Technologies Research Center: Hydrogen Storage Engineering Center of Excellence	IV-29
IV.B.3	United Technologies Research Center: Advancement of Systems Designs and Key Engineering Technologies for Materials-Based Hydrogen Storage	IV-46
V.B.2	FuelCell Energy, Inc.: High-Temperature Membrane with Humidification-Independent Cluster Structure	V-83

Connecticut (Continued)

V.C.2	United Technologies Research Center: Rationally Designed Catalyst Layers for PEMFC Performance Optimization.	V-95
V.E.2	University of Connecticut: The Effect of Airborne Contaminants on Fuel Cell Performance and Durability	V-135
V.E.2	UTC Power: The Effect of Airborne Contaminants on Fuel Cell Performance and Durability.	V-135
V.F.1	United Technologies Research Center: Fuel Cell Fundamentals at Low and Subzero Temperatures	V-141
V.M.1	University of Connecticut: Improving Fuel Cell Durability and Reliability.	V-238
V.N.17	University of Connecticut: Porous Transition Metal Oxides: Synthesis, Characterization, and Catalytic Activity.	V-301
V.N.18	University of Connecticut: Understanding the Effects of Surface Chemistry and Microstructure on the Activity and Stability of Pt Electrocatalysts on Non-Carbon Supports	V-305
VI.2	UTC Power: Manufacturing of Low-Cost, Durable Membrane Electrode Assemblies Engineered for Rapid Conditioning.	VI-11
VII.5	SunHydro LLC: Validation of an Advanced High-Pressure PEM Electrolyzer and Composite Hydrogen Storage, with Data Reporting, for SunHydro Stations	VII-22
VIII.1	Kelvin Hecht: Fuel Cell Technologies National Codes and Standards Development and Outreach	VIII-7
VIII.9	GWS Solutions of Tolland, LLC: Hydrogen Safety Panel and Hydrogen Safety Knowledge Tools.	VIII-46

Delaware

IV.D.2	Delaware State University: Hydrogen Storage Materials for Fuel Cell-Powered Vehicles.	IV-121
IV.D.2	University of Delaware: Hydrogen Storage Materials for Fuel Cell-Powered Vehicles	IV-121
V.A.2	University of Delaware: Extended, Continuous Pt Nanostructures in Thick, Dispersed Electrodes	V-14
V.B.3	Ion Power Inc.: Corrugated Membrane Fuel Cell Structures	V-86
V.D.1	Ion Power Inc.: Durability Improvements through Degradation Mechanism Studies	V-98
V.D.3	Ion Power Inc.: Accelerated Testing Validation.	V-109
V.I.2	University of Delaware: Advanced Materials and Concepts for Portable Power Fuel Cells	V-220
VI.2	University of Delaware: Manufacturing of Low-Cost, Durable Membrane Electrode Assemblies Engineered for Rapid Conditioning.	VI-11

Florida

VIII.9	Addison Bain: Hydrogen Safety Panel and Hydrogen Safety Knowledge Tools	VIII-46
--------	---	---------

Georgia

IV.E.5	Savannah River National Laboratory: Electrochemical Reversible Formation of Alane	IV-150
V.D.5	Georgia Institute of Technology: Development of Micro-Structural Mitigation Strategies for PEM Fuel Cells: Morphological Simulations and Experimental Approaches	V-121
V.N.8	Georgia Institute of Technology: Precisely Tunable High Performance Carbon Molecular Sieve Membranes for Energy Intensive Separations.	V-268

Hawaii

II.C.2	University of Hawaii at Manoa: Photoelectrochemical Hydrogen Production	II-75
IV.C.6	University of Hawaii: Weak Chemisorption Validation	IV-103
IV.E.2	Hawaii Hydrogen Carriers, LLC: Development of a Practical Hydrogen Storage System Based on Liquid Organic Hydrogen Carriers and a Homogeneous Catalyst	IV-135
V.E.1	University of Hawaii: Effect of System Contaminants on PEMFC Performance and Durability	V-129
V.E.2	Hawaii Natural Energy Institute: The Effect of Airborne Contaminants on Fuel Cell Performance and Durability	V-135

Hawaii (Continued)

IX.4 Hawaii Natural Energy Institute: Hydrogen Energy Systems as a Grid Management Tool IX-19

Illinois

II.A.5 Illinois Institute of Technology: Economical Production of Hydrogen through Development of Novel, High Efficiency Electrocatalysts for Alkaline Membrane Electrolysis II-26

II.B.1 Argonne National Laboratory: Electrolyzer Development in the Cu-Cl Thermochemical Cycle II-43

II.B.1 Gas Technology Institute: Electrolyzer Development in the Cu-Cl Thermochemical Cycle II-43

II.B.1 Orion Enterprises, Inc.: Electrolyzer Development in the Cu-Cl Thermochemical Cycle II-43

III.1 Argonne National Laboratory: Hydrogen Delivery Infrastructure Analysis III-11

IV.A.1 Argonne National Laboratory: System Analysis of Physical and Materials-Based Hydrogen Storage Options IV-11

IV.C.5 Northwestern University: Metallation of Metal–Organic Frameworks: En Route to Ambient Temperature Storage of Molecular Hydrogen IV-99

IV.D.1 Northwestern University: Design of Novel Multi-Component Metal Hydride-Based Mixtures for Hydrogen Storage IV-112

V.A.3 Argonne National Laboratory: Nanosegregated Cathode Catalysts with Ultra-Low Platinum Loading V-19

V.A.8 Illinois Institute of Technology: Synthesis and Characterization of Mixed-Conducting Corrosion Resistant Oxide Supports V-50

V.C.1 Argonne National Laboratory: High-Performance, Durable, Low-Cost Membrane Electrode Assemblies for Transportation Applications V-90

V.C.2 Argonne National Laboratory: Rationally Designed Catalyst Layers for PEMFC Performance Optimization V-95

V.D.1 Argonne National Laboratory: Durability Improvements through Degradation Mechanism Studies V-98

V.D.2 Argonne National Laboratory: Durability of Low-Platinum Fuel Cells Operating at High Power Density V-104

V.H.1 Argonne National Laboratory: Fuel Cells Systems Analysis V-175

V.I.1 Illinois Institute of Technology: Novel Materials for High Efficiency Direct Methanol Fuel Cells V-216

V.K.1 Gas Technology Institute: Low-Cost PEM Fuel Cell Metal Bipolar Plates V-231

V.N.1 University of Chicago: Computer Simulation of Proton Transport in Fuel Cell Membranes V-243

V.N.10 Argonne National Laboratory: Structure/Composition/Function Relationships in Supported Nanoscale Catalysts for Hydrogen V-276

IX.3 Gas Technology Institute: Landfill Gas-to-Hydrogen IX-16

IX.6 Argonne National Laboratory: Fuel Cells as Range Extenders for Battery Electric Vehicles IX-26

XI.5 Argonne National Laboratory: Life-Cycle Analysis of Hydrogen Onboard Storage Options XI-29

XI.6 Argonne National Laboratory: Employment Impacts of Infrastructure Development for Hydrogen and Fuel Cell Technologies XI-33

XI.6 RCF Economic and Financial Consulting, Inc.: Employment Impacts of Infrastructure Development for Hydrogen and Fuel Cell Technologies XI-33

XI.10 Argonne National Laboratory: Life-Cycle Analysis of Water Use for Hydrogen Production Pathways XI-48

V.C.2 Indiana University Purdue University: Rationally Designed Catalyst Layers for PEMFC Performance Optimization V-95

Kansas

X.4 Black & Veatch Corporation: Use of 72-Hour Hydrogen PEM Fuel Cell Systems to Support Emergency Communications X-16

X.4 Ericsson Services, Inc.: Use of 72-Hour Hydrogen PEM Fuel Cell Systems to Support Emergency Communications X-16

Maryland

IV.B.5	Mark Paster: System Design, Analysis, Modeling, and Media Engineering Properties for Hydrogen Energy Storage	IV-57
IV.C.3	National Institute of Standards and Technology: Hydrogen Storage in Metal-Organic Frameworks	IV-89
IV.D.3	National Institute of Standards and Technology: Neutron Characterization in Support of the DOE Hydrogen Storage Sub-Program	IV-126
V.C.1	Johns Hopkins University: High-Performance, Durable, Low-Cost Membrane Electrode Assemblies for Transportation Applications	V-90
V.D.1	National Institute of Standards and Technology: Durability Improvements through Degradation Mechanism Studies	V-98
V.H.4	National Institute of Standards and Technology: Neutron Imaging Study of the Water Transport in Operating Fuel Cells	V-193
VI.2	W. L. Gore & Associates, Inc.: Manufacturing of Low-Cost, Durable Membrane Electrode Assemblies Engineered for Rapid Conditioning.	VI-11
VI.4	National Institute of Standards and Technology: Metrology for Fuel Cell Manufacturing	VI-23

Massachusetts

II.A.1	Giner, Inc.: PEM Electrolyzer Incorporating an Advanced Low-Cost Membrane.	II-11
II.A.6	Giner, Inc.: Unitized Design for Home Refueling Appliance for Hydrogen Generation to 5,000 psi	II-31
III.10	Concepts NREC: Development of a Centrifugal Hydrogen Pipeline Gas Compressor	III-48
IV.E.3	Protonex Technology Corporation: Novel Carbon(C)-Boron(B)-Nitrogen(N)-Containing H2 Storage Materials.	IV-140
V.A.4	Massachusetts Institute of Technology: Contiguous Platinum Monolayer Oxygen Reduction Electrocatalysts on High-Stability Low-Cost Supports.	V-26
V.A.9	Northeastern University: Development of Novel Non-PGM Electrocatalysts for Proton Exchange Membrane Fuel Cell Applications	V-54
V.A.10	Massachusetts Institute of Technology: High-Activity Dealloyed Catalysts	V-61
V.A.10	Northeastern University: High-Activity Dealloyed Catalysts.	V-61
V.B.1	Giner, Inc.: Dimensionally Stable High Performance Membrane.	V-79
V.B.2	Giner, Inc.: High-Temperature Membrane with Humidification-Independent Cluster Structure.	V-83
V.D.2	Nuvera Fuel Cells, Inc.: Durability of Low-Platinum Fuel Cells Operating at High Power Density	V-104
V.F.2	Giner, Inc.: Transport in PEMFCs	V-147
V.F.2	Tech-Etch: Transport in PEMFCs	V-147
V.F.2	Ballard Material Products, Inc.: Transport in PEMFCs	V-147
V.F.4	Nuvera Fuel Cells, Inc.: Transport Studies Enabling Efficiency Optimization of Cost-Competitive Fuel Cell Stacks	V-159
V.G.1	Protonex Inc.: Large-Scale Testing, Demonstration and Commercialization of the Nanoparticle-Based Fuel Cell Coolant (SBIR Phase III)	V-162
V.K.1	IBIS Associates, Inc.: Low-Cost PEM Fuel Cell Metal Bipolar Plates	V-231
V.N.26	Tufts University: Metal Ion Sites on Oxide Supports as Catalysts for the Water-Gas Shift and Methanol Steam Reforming Reactions	V-335
VIII.1	National Fire Protection Association: Fuel Cell Technologies National Codes and Standards Development and Outreach	VIII-7
VIII.9	Firexplo: Hydrogen Safety Panel and Hydrogen Safety Knowledge Tools.	VIII-46
IX.3	Ameresco, Inc.: Landfill Gas-to-Hydrogen	IX-16
IX.5	Nuvera Fuel Cells, Inc.: Ground Support Equipment Demonstration.	IX-24

Michigan

III.7	University of Michigan: Vessel Design and Fabrication Technology for Stationary High-Pressure Hydrogen Storage	III-37
IV.B.1	General Motors Company: Hydrogen Storage Engineering Center of Excellence	IV-29
IV.B.1	Ford Motor Company: Hydrogen Storage Engineering Center of Excellence	IV-29
IV.B.1	University of Michigan: Hydrogen Storage Engineering Center of Excellence	IV-29
IV.B.6	General Motors Company: Thermal Management of Onboard Cryogenic Hydrogen Storage Systems	IV-63
IV.B.7	Ford Motor Company: Ford/BASF-SE/UM Activities in Support of the Hydrogen Storage Engineering Center of Excellence	IV-67
IV.B.7	University of Michigan: Ford/BASF-SE/UM Activities in Support of the Hydrogen Storage Engineering Center of Excellence	IV-67
IV.C.3	General Motors Company: Hydrogen Storage in Metal-Organic Frameworks	IV-89
IV.D.1	Ford Motor Company: Design of Novel Multi-Component Metal Hydride-Based Mixtures for Hydrogen Storage	IV-112
IV.E.2	General Motors Company: Development of a Practical Hydrogen Storage System Based on Liquid Organic Hydrogen Carriers and a Homogeneous Catalyst	IV-135
IV.F.4	Ford Motor Company: Synergistically Enhanced Materials and Design Parameters for Reducing the Cost of Hydrogen Storage Tanks	IV-171
V.A.8	Nissan Technical Center: Synthesis and Characterization of Mixed-Conducting Corrosion Resistant Oxide Supports	V-50
V.A.9	Michigan State University: Development of Novel Non-PGM Electrocatalysts for Proton Exchange Membrane Fuel Cell Applications	V-54
V.A.9	Nissan Technical Center: Development of Novel Non-PGM Electrocatalysts for Proton Exchange Membrane Fuel Cell Applications	V-54
V.A.10	General Motors Company: High-Activity Dealloyed Catalysts	V-61
V.B.3	General Motors Company: Corrugated Membrane Fuel Cell Structures	V-86
V.C.1	Michigan Technological University: High-Performance, Durable, Low-Cost Membrane Electrode Assemblies for Transportation Applications	V-90
V.C.1	General Motors Company: High-Performance, Durable, Low-Cost Membrane Electrode Assemblies for Transportation Applications	V-90
V.D.5	Michigan Technological University: Development of Micro-Structural Mitigation Strategies for PEM Fuel Cells: Morphological Simulations and Experimental Approaches	V-121
V.F.3	General Motors Company: Investigation of Micro- and Macro-Scale Transport Processes for Improved Fuel Cell Performance	V-153
V.G.3	Kettering University: Roots Air Management System with Integrated Expander	V-170
V.K.1	Ford Motor Company: Low-Cost PEM Fuel Cell Metal Bipolar Plates	V-231
VIII.1	SAE International: Fuel Cell Technologies National Codes and Standards Development and Outreach	VIII-7
VIII.9	General Motors Company: Hydrogen Safety Panel and Hydrogen Safety Knowledge Tools	VIII-46
X.1	Delphi Automotive Systems, LLC: Solid Oxide Fuel Cell Diesel Auxiliary Power Unit Demonstration	X-7

Minnesota

II.A.3	Entegris, Inc.: High-Performance, Low-Cost Hydrogen Generation from Renewable Energy	II-18
II.A.4	3M Company: Low-Cost Large-Scale PEM Electrolysis for Renewable Energy Storage	II-22
V.A.1	3M Company: Durable Catalysts for Fuel Cell Protection during Transient Conditions	V-9
V.A.3	3M Company: Nanosegregated Cathode Catalysts with Ultra-Low Platinum Loading	V-19
V.C.1	3M Company: High-Performance, Durable, Low-Cost Membrane Electrode Assemblies for Transportation Applications	V-90
V.F.1	3M Company: Fuel Cell Fundamentals at Low and Subzero Temperatures	V-141

Minnesota (Continued)

- V.L.1 3M Company: Advanced Ionomers and MEAs for Alkaline Membrane Fuel Cells V-235

Missouri

- VIII.9 Becht Engineering: Hydrogen Safety Panel and Hydrogen Safety Knowledge Tools VIII-46
 X.4 Burns & McDonnell Engineering Co., Inc.: Use of 72-Hour Hydrogen PEM Fuel Cell Systems to Support Emergency Communications X-16

Nebraska

- III.3 Hexagon Lincoln: Development of High-Pressure Hydrogen Storage Tank for Storage and Gaseous Truck Delivery III-21
 IV.B.1 Hexagon Lincoln: Hydrogen Storage Engineering Center of Excellence IV-29
 IV.B.9 Hexagon Lincoln: Development of Improved Composite Pressure Vessels for Hydrogen Storage IV-76
 IV.F.4 Hexagon Lincoln: Synergistically Enhanced Materials and Design Parameters for Reducing the Cost of Hydrogen Storage Tanks IV-171

Nevada

- II.C.1 University of Nevada, Las Vegas: Semiconductor Materials for Photoelectrolysis II-70
 II.C.5 University of Nevada, Las Vegas: Metal Oxide Semiconductor Nanotubular Arrays for Photoelectrochemical Hydrogen Generation II-89

New Jersey

- IV.C.7 Rutgers University: Hydrogen Trapping through Designer Hydrogen Spillover Molecules with Reversible Temperature and Pressure-Induced Switching IV-107
 V.K.1 TreadStone Technologies, Inc.: Low-Cost PEM Fuel Cell Metal Bipolar Plates V-231
 V.N.24 Rutgers University: Nanoscale Surface Chemistry and Electrochemistry of Clean and Metal-Covered Faceted Substrates: Structure, Reactivity and Electronic Properties V-328
 VI.5 BASF Fuel Cell, Inc.: High-Speed, Low-Cost Fabrication of Gas Diffusion Electrodes for Membrane Electrode Assemblies VI-27

New Mexico

- II.C.6 Los Alamos National Laboratory: Photoelectrochemical Material Synthesis at LANL II-93
 IV.B.1 Los Alamos National Laboratory: Hydrogen Storage Engineering Center of Excellence IV-29
 IV.B.4 Los Alamos National Laboratory: Chemical Hydride Rate Modeling, Validation, and System Demonstration IV-53
 IV.E.1 Los Alamos National Laboratory: Fluid Phase Chemical Hydrogen Storage Materials IV-131
 V.A.2 Los Alamos National Laboratory: Extended, Continuous Pt Nanostructures in Thick, Dispersed Electrodes V-14
 V.A.5 Los Alamos National Laboratory: The Science and Engineering of Durable Ultra-Low PGM Catalysts V-31
 V.A.5 University of New Mexico: The Science and Engineering of Durable Ultra-Low PGM Catalysts V-31
 V.A.6 Los Alamos National Laboratory: Engineered Nano-Scale Ceramic Supports for PEM Fuel Cells V-37
 V.A.6 University of New Mexico: Engineered Nano-Scale Ceramic Supports for PEM Fuel Cells V-37
 V.A.9 University of New Mexico: Development of Novel Non-PGM Electrocatalysts for Proton Exchange Membrane Fuel Cell Applications V-54
 V.A.9 Pajarito Powder: Development of Novel Non-PGM Electrocatalysts for Proton Exchange Membrane Fuel Cell Applications V-54
 V.A.9 Los Alamos National Laboratory: Development of Novel Non-PGM Electrocatalysts for Proton Exchange Membrane Fuel Cell Applications V-54

New Mexico (Continued)

V.A.12 Los Alamos National Laboratory: Non-Precious Metal Fuel Cell Cathodes: Catalyst Development and Electrode Structure Design V-74

V.A.12 IRD Fuel Cells, LLC: Non-Precious Metal Fuel Cell Cathodes: Catalyst Development and Electrode Structure Design V-74

V.D.1 Los Alamos National Laboratory: Durability Improvements through Degradation Mechanism Studies V-98

V.D.1 University of New Mexico: Durability Improvements through Degradation Mechanism Studies V-98

V.D.2 Los Alamos National Laboratory: Durability of Low-Platinum Fuel Cells Operating at High Power Density V-104

V.D.3 Los Alamos National Laboratory: Accelerated Testing Validation. V-109

V.D.3 University of New Mexico: Accelerated Testing Validation V-109

V.D.5 Los Alamos National Laboratory: Development of Micro-Structural Mitigation Strategies for PEM Fuel Cells: Morphological Simulations and Experimental Approaches V-121

V.D.5 University of New Mexico: Development of Micro-Structural Mitigation Strategies for PEM Fuel Cells: Morphological Simulations and Experimental Approaches V-121

V.E.1 Los Alamos National Laboratory: Effect of System Contaminants on PEMFC Performance and Durability V-129

V.F.1 Los Alamos National Laboratory: Fuel Cell Fundamentals at Low and Subzero Temperatures V-141

V.H.8 Los Alamos National Laboratory: Technical Assistance to Developers V-212

V.I.1 IRD Fuel Cells, LLC: Novel Materials for High Efficiency Direct Methanol Fuel Cells V-216

V.I.2 Los Alamos National Laboratory: Advanced Materials and Concepts for Portable Power Fuel Cells V-220

V.N.6 University of New Mexico: Nanostructured Catalysts for Hydrogen Production from Renewable Feedstocks V-260

VIII.3 Los Alamos National Laboratory: Hydrogen Safety, Codes and Standards: Sensors. VIII-14

VIII.5 Los Alamos National Laboratory: Hydrogen Fuel Quality VIII-28

New York

II.A.8 Brookhaven National Laboratory: Low-Noble-Metal-Content Catalysts/Electrodes for Hydrogen Production by Water Electrolysis. II-39

II.B.2 Electrosynthesis Co. Inc.: Solar High-Temperature Water-Splitting Cycle with Quantum Boost II-48

III.2 Mohawk Innovative Technologies, Inc.: Oil-Free Centrifugal Hydrogen Compression Technology Demonstration III-16

IV.E.4 Brookhaven National Laboratory: Aluminum Hydride: the Organometallic Approach IV-146

V.A.2 State University of New York, Albany: Extended, Continuous Pt Nanostructures in Thick, Dispersed Electrodes V-14

V.A.4 Brookhaven National Laboratory: Contiguous Platinum Monolayer Oxygen Reduction Electrocatalysts on High-Stability Low-Cost Supports V-26

V.A.12 General Motors Company: Non-Precious Metal Fuel Cell Cathodes: Catalyst Development and Electrode Structure Design V-74

V.A.12 University of Rochester: Non-Precious Metal Fuel Cell Cathodes: Catalyst Development and Electrode Structure Design V-74

V.E.1 General Motors Company: Effect of System Contaminants on PEMFC Performance and Durability V-129

V.F.3 Rochester Institute of Technology: Investigation of Micro- and Macro-Scale Transport Processes for Improved Fuel Cell Performance V-153

V.F.3 University of Rochester: Investigation of Micro- and Macro-Scale Transport Processes for Improved Fuel Cell Performance V-153

V.I.2 Brookhaven National Laboratory: Advanced Materials and Concepts for Portable Power Fuel Cells V-220

V.K.1 Stony Brook University: Low-Cost PEM Fuel Cell Metal Bipolar Plates V-231

New York (Continued)

V.N.5	Columbia University: Structure-Property Relationship in Metal Carbides and Bimetallic Alloys	V-257
V.N.11	Brookhaven National Laboratory: Metal and Metal Oxide-Supported Platinum Monolayer Electrocatalysts for Oxygen Reduction	V-280
V.N.12	Brookhaven National Laboratory: Active Sites and Mechanism for the Water-Gas Shift Reaction on Metal and Metal/Oxide Catalysts.	V-284
VI.3	Rensselaer Polytechnic Institute: Adaptive Process Controls and Ultrasonics for High-Temperature PEM MEA Manufacture	VI-17
VII.3	H2Pump LLC: Hydrogen Recycling System Evaluation and Data Collection	VII-15
IX.5	Plug Power Inc.: Ground Support Equipment Demonstration	IX-24
X.2	Plug Power Inc.: Highly Efficient, 5-kW CHP Fuel Cells Demonstrating Durability and Economic Value in Residential and Light Commercial Applications	X-10
X.3	Plug Power Inc.: Accelerating Acceptance of Fuel Cell Backup Power Systems	X-13

Ohio

II.C.3	Midwest Optoelectronics, LLC: Critical Research for Cost-Effective Photoelectrochemical Production of Hydrogen	II-79
II.C.3	Xunlight Corporation: Critical Research for Cost-Effective Photoelectrochemical Production of Hydrogen	II-79
II.C.3	University of Toledo: Critical Research for Cost-Effective Photoelectrochemical Production of Hydrogen	II-79
IV.D.1	Ohio State University: Design of Novel Multi-Component Metal Hydride-Based Mixtures for Hydrogen Storage.	IV-112
V.B.3	Graftech International Holdings Inc.: Corrugated Membrane Fuel Cell Structures	V-86
V.H.6	Battelle: Stationery and Emerging Market Fuel Cell System Cost Analysis - Material Handling Equipment	V-203
V.N.20	Ohio State University: Investigation of the Nature of Active Sites on Heteroatom-Containing Carbon Nano-Structures for Oxygen Reduction Reaction.	V-313
VI.5	Case Western Reserve University: High-Speed, Low-Cost Fabrication of Gas Diffusion Electrodes for Membrane Electrode Assemblies.	VI-27
VII.1	Battelle: Technology Validation: Fuel Cell Bus Evaluations	VII-7
VIII.9	Powdermet Inc.: Hydrogen Safety Panel and Hydrogen Safety Knowledge Tools	VIII-46

Oregon

IV.B.1	Oregon State University: Hydrogen Storage Engineering Center of Excellence	IV-29
IV.B.8	Oregon State University: Microscale Enhancement of Heat and Mass Transfer for Hydrogen Energy Storage	IV-71
IV.E.3	University of Oregon: Novel Carbon(C)-Boron(B)-Nitrogen(N)-Containing H2 Storage Materials	IV-140
IX.2	ClearEdge Power: Fuel Cell Combined Heat and Power Commercial Demonstration.	IX-11
X.3	IdaTech, LLC: Accelerating Acceptance of Fuel Cell Backup Power Systems	X-13

Pennsylvania

II.A.3	Pennsylvania State University: High-Performance, Low-Cost Hydrogen Generation from Renewable Energy	II-18
II.B.1	Pennsylvania State University: Electrolyzer Development in the Cu-Cl Thermochemical Cycle.	II-43
II.B.4	Bucknell University: Solar Hydrogen Production with a Metal Oxide-Based Thermochemical Cycle.	II-62
II.D.3	Pennsylvania State University: Fermentation and Electrohydrogenic Approaches to Hydrogen Production	II-108

Pennsylvania (Continued)

IV.C.7	Pennsylvania State University: Hydrogen Trapping through Designer Hydrogen Spillover Molecules with Reversible Temperature and Pressure-Induced Switching	IV-107
V.A.3	University of Pittsburgh: Nanosegregated Cathode Catalysts with Ultra-Low Platinum Loading	V-19
V.A.12	Carnegie Mellon University: Non-Precious Metal Fuel Cell Cathodes: Catalyst Development and Electrode Structure Design	V-74
V.F.1	Pennsylvania State University: Fuel Cell Fundamentals at Low and Subzero Temperatures	V-141
V.F.3	Pennsylvania State University: Investigation of Micro- and Macro-Scale Transport Processes for Improved Fuel Cell Performance	V-153
V.F.4	Pennsylvania State University: Transport Studies Enabling Efficiency Optimization of Cost-Competitive Fuel Cell Stacks	V-159
V.G.1	Dynalene Inc.: Large-Scale Testing, Demonstration and Commercialization of the Nanoparticle-Based Fuel Cell Coolant (SBIR Phase III)	V-162
V.I.1	Arkema Inc.: Novel Materials for High Efficiency Direct Methanol Fuel Cells	V-216
V.N.3	Lehigh University: Gas Transport Across Hyperthin Membranes	V-251
V.N.21	University of Pennsylvania: Oxide-Metal Interactions Studied on M@Oxide, Core-Shell Catalysts	V-318
V.N.22	University of Pennsylvania: Fundamental Studies of the Steam Reforming of Alcohols on PdZnO and Co/ZnO Catalysts	V-320
V.N.23	University of Pittsburgh: Theoretically Relating the Surface Composition of the Pt Alloys to Their Performance as the Electrocatalysts of Low-Temperature Fuel Cells	V-324
VIII.9	Air Products and Chemicals, Inc.: Hydrogen Safety Panel and Hydrogen Safety Knowledge Tools	VIII-46
X.4	Air Products and Chemicals, Inc.: Use of 72-Hour Hydrogen PEM Fuel Cell Systems to Support Emergency Communications	X-16

Rhode Island

V.A.3	Brown University: Nanosegregated Cathode Catalysts with Ultra-Low Platinum Loading	V-19
-------	--	------

South Carolina

II.B.5	Savannah River National Laboratory: Electrolyzer Development for the HyS Thermochemical Cycle	II-68
III.4	Savannah River National Laboratory: Fiber Reinforced Composite Pipeline	III-25
IV.B.1	Savannah River National Laboratory: Hydrogen Storage Engineering Center of Excellence	IV-29
IV.E.5	Greenway Energy, LLC: Electrochemical Reversible Formation of Alane	IV-150
V.A.11	University of South Carolina: Development of Ultra-Low Platinum Alloy Cathode Catalyst for Polymer Electrolyte Membrane Fuel Cells	V-68
V.E.1	University of South Carolina: Effect of System Contaminants on PEMFC Performance and Durability	V-129
V.F.2	University of South Carolina: Transport in PEMFCs	V-147
V.G.2	Tetramer Technologies, LLC: New High-Performance Water Vapor Membranes To Improve Fuel Cell Balance-of-Plant Efficiency and Lower Costs	V-166
V.N.2	Clemson University: Fluoropolymers, Electrolytes, Composites and Electrodes	V-247
VIII.1	Davidson Code Concepts: Fuel Cell Technologies National Codes and Standards Development and Outreach	VIII-7
IX.3	Advanced Technology International: Landfill Gas-to-Hydrogen	IX-16

Tennessee

II.A.3	Oak Ridge National Laboratory: High-Performance, Low-Cost Hydrogen Generation from Renewable Energy	II-18
III.7	Oak Ridge National Laboratory: Vessel Design and Fabrication Technology for Stationary High-Pressure Hydrogen Storage	III-37
IV.C.4	Oak Ridge National Laboratory: The Quantum Effects of Pore Structure on Hydrogen Adsorption	IV-93

Tennessee (Continued)

IV.F.1	Oak Ridge National Laboratory: Lifecycle Verification of Polymeric Storage Tank Liners	IV-154
IV.F.2	Oak Ridge National Laboratory: Melt Processable PAN Precursor for High-Strength, Low-Cost Carbon Fibers	IV-160
IV.F.3	Oak Ridge National Laboratory: Development of Low-Cost, High-Strength Commercial Textile Precursor (PAN-MA)	IV-165
IV.F.4	AOC, LLC: Synergistically Enhanced Materials and Design Parameters for Reducing the Cost of Hydrogen Storage Tanks	IV-171
V.A.1	Oak Ridge National Laboratory: Durable Catalysts for Fuel Cell Protection during Transient Conditions	V-9
V.A.2	Oak Ridge National Laboratory: Extended, Continuous Pt Nanostructures in Thick, Dispersed Electrodes	V-14
V.A.2	University of Tennessee: Extended, Continuous Pt Nanostructures in Thick, Dispersed Electrodes	V-14
V.A.3	Oak Ridge National Laboratory: Nanosegregated Cathode Catalysts with Ultra-Low Platinum Loading	V-19
V.A.6	Oak Ridge National Laboratory: Engineered Nano-Scale Ceramic Supports for PEM Fuel Cells	V-37
V.A.9	University of Tennessee: Development of Novel Non-PGM Electrocatalysts for Proton Exchange Membrane Fuel Cell Applications	V-54
V.A.12	Oak Ridge National Laboratory: Non-Precious Metal Fuel Cell Cathodes: Catalyst Development and Electrode Structure Design	V-74
V.D.1	Oak Ridge National Laboratory: Durability Improvements through Degradation Mechanism Studies	V-98
V.D.3	Oak Ridge National Laboratory: Accelerated Testing Validation	V-109
V.F.3	University of Tennessee: Investigation of Micro- and Macro-Scale Transport Processes for Improved Fuel Cell Performance	V-153
V.G.1	University of Tennessee: Large-Scale Testing, Demonstration and Commercialization of the Nanoparticle-Based Fuel Cell Coolant (SBIR Phase III)	V-162
V.H.3	Oak Ridge National Laboratory: Characterization of Fuel Cell Materials	V-186
V.I.2	Oak Ridge National Laboratory: Advanced Materials and Concepts for Portable Power Fuel Cells	V-220
V.N.13	Oak Ridge National Laboratory: Fundamentals of Catalysis and Chemical Transformations	V-288
VI.2	University of Tennessee: Manufacturing of Low-Cost, Durable Membrane Electrode Assemblies Engineered for Rapid Conditioning	VI-11
XI.1	Oak Ridge National Laboratory: Worldwide Status of Hydrogen Fuel Cell Vehicle Technology and Prospects for Commercialization	XI-13
XI.4	Oak Ridge National Laboratory: Analysis of Optimal Onboard Storage Pressure for Hydrogen Fuel Cell Vehicles	XI-25

Texas

III.10	Texas A&M University: Development of a Centrifugal Hydrogen Pipeline Gas Compressor	III-48
V.C.2	University of Texas at Austin: Rationally Designed Catalyst Layers for PEMFC Performance Optimization	V-95
V.N.4	University of Texas: Theory-Guided Design of Nanoscale Multi-Metallic Catalysts For Fuel Cells	V-254
V.N.7	University of Texas at Austin: Fundamental Structure/Property Studies of Gas Separation Membrane Polymers	V-264
V.N.25	University of Texas: Correlation of Theory and Function in Well-Defined Bimetallic Electrocatalysts	V-331
VIII.9	William C. Fort: Hydrogen Safety Panel and Hydrogen Safety Knowledge Tools	VIII-46

Utah

III.7	MegaStir Technologies: Vessel Design and Fabrication Technology for Stationary High-Pressure Hydrogen Storage	III-37
-------	---	--------

Virginia

II.A.1	Virginia Polytechnic Institute and State University: PEM Electrolyzer Incorporating an Advanced Low-Cost Membrane	II-11
IV.A.2	Strategic Analysis, Inc.: Hydrogen Storage Cost Analysis	IV-18
IV.B.5	Strategic Analysis, Inc.: System Design, Analysis, Modeling, and Media Engineering Properties for Hydrogen Energy Storage.	IV-57
IV.F.2	Virginia Polytechnic Institute and State University: Melt Processable PAN Precursor for High-Strength, Low-Cost Carbon Fibers	IV-160
V.F.2	Virginia Polytechnic Institute and State University: Transport in PEMFCs	V-147
V.H.2	Strategic Analysis, Inc.: Fuel Cell Transportation Cost Analysis	V-181
V.H.7	Strategic Analysis, Inc.: A Total Cost of Ownership Model for Design and Manufacturing Optimization of Fuel Cells in Stationary and Emerging Market Applications	V-207
V.I.2	Virginia Polytechnic Institute and State University: Advanced Materials and Concepts for Portable Power Fuel Cells.	V-220
V.N.27	Virginia Tech: Hydrocarbon Oxidation, Dehydrogenation and Coupling over Model Metal Oxide Surfaces	V-340
V.N.28	Virginia Tech: Atomic Level Studies of Advanced Catalysts for Hydrodeoxygenation.	V-343
VIII.1	Compressed Gas Association: Fuel Cell Technologies National Codes and Standards Development and Outreach	VIII-7
X.4	Sprint Nextel: Use of 72-Hour Hydrogen PEM Fuel Cell Systems to Support Emergency Communications	X-16

Washington

II.E.2	Pacific Northwest National Laboratory: Biomass-Derived Liquids Distributed Reforming	II-124
III.7	Global Engineering and Technology: Vessel Design and Fabrication Technology for Stationary High-Pressure Hydrogen Storage.	III-37
III.11	Pacific Northwest National Laboratory: Investigation of H ₂ Diaphragm Compressors to Enable Low-Cost Long-Life Operation	III-53
IV.B.1	Pacific Northwest National Laboratory: Hydrogen Storage Engineering Center of Excellence	IV-29
IV.B.2	Pacific Northwest National Laboratory: Systems Engineering of Chemical Hydrogen Storage, Pressure Vessel, and Balance of Plant for Onboard Hydrogen Storage	IV-38
IV.E.3	Pacific Northwest National Laboratory: Novel Carbon(C)-Boron(B)-Nitrogen(N)-Containing H ₂ Storage Materials	IV-140
IV.F.4	Pacific Northwest National Laboratory: Synergistically Enhanced Materials and Design Parameters for Reducing the Cost of Hydrogen Storage Tanks	IV-171
V.J.1	InnovaTek: Power Generation from an Integrated Biomass Reformer and Solid Oxide Fuel Cell (SBIR Phase III Xlerator Program)	V-227
V.N.14	Pacific Northwest National Laboratory: Activation of Small Molecules with Bi-Functional Amphiphilic Catalyst Complexes	V-292
V.N.15	Pacific Northwest National Laboratory: Bio-Inspired Molecular Catalysts for Oxidation of Hydrogen and Production of Hydrogen: Cheap Metals for Noble Tasks	V-295
VI.6	Boeing Research and Technology: Development of Advanced Manufacturing Technologies for Low-Cost Hydrogen Storage Vessels.	VI-30
VI.6	Pacific Northwest National Laboratory: Development of Advanced Manufacturing Technologies for Low-Cost Hydrogen Storage Vessels	VI-30
VIII.8	Pacific Northwest National Laboratory: Hydrogen Emergency Response Training for First Responders.	VIII-43
VIII.8	Hanford Fire Department: Hydrogen Emergency Response Training for First Responders	VIII-43
VIII.8	Hazardous Materials Management and Emergency Response Training and Education Center: Hydrogen Emergency Response Training for First Responders	VIII-43

Washington (Continued)

VIII.9	Pacific Northwest National Laboratory: Hydrogen Safety Panel and Hydrogen Safety Knowledge Tools	VIII-46
IX.2	Pacific Northwest National Laboratory: Fuel Cell Combined Heat and Power Commercial Demonstration	IX-11
X.1	PACCAR, Inc.: Solid Oxide Fuel Cell Diesel Auxiliary Power Unit Demonstration	X-7
X.4	ReliOn, Inc.: Use of 72-Hour Hydrogen PEM Fuel Cell Systems to Support Emergency Communications	X-16

Washington, D.C.

V.A.10	George Washington University: High-Activity Dealloyed Catalysts	V-61
V.N.19	Georgetown University: In Situ NMR/IR/Raman and ab initio DFT Investigations of Pt-Based Mono- and Bi-metallic Nanoscale Electrocatalysts: from Sulfur-Poisoning to Polymer Promoters to Surface Activity Indexes	V-309
VIII.1	Fuel Cell and Hydrogen Energy Association: Fuel Cell Technologies National Codes and Standards Development and Outreach	VIII-7
XI.1	HD Systems: Worldwide Status of Hydrogen Fuel Cell Vehicle Technology and Prospects for Commercialization	XI-13

Wisconsin

V.G.3	Eaton Corporation: Roots Air Management System with Integrated Expander	V-170
V.N.29	University of Wisconsin: Atomic-Scale Design of Metal and Alloy Catalysts: A Combined Theoretical and Experimental Approach	V-347
II.A.4	University of Wyoming: Low-Cost Large-Scale PEM Electrolysis for Renewable Energy Storage	II-22

Foreign Countries**Canada**

IV.B.1	Université du Québec à Trois-Rivières: Hydrogen Storage Engineering Center of Excellence	IV-29
V.A.1	Dalhousie University: Durable Catalysts for Fuel Cell Protection during Transient Conditions	V-9
V.A.1	Automotive Fuel Cell Cooperation: Durable Catalysts for Fuel Cell Protection during Transient Conditions	V-9
V.A.5	Ballard Fuel Cells: The Science and Engineering of Durable Ultra-Low PGM Catalysts	V-31
V.A.12	University of Waterloo: Non-Precious Metal Fuel Cell Cathodes: Catalyst Development and Electrode Structure Design	V-74
V.D.1	Ballard Power Systems: Durability Improvements through Degradation Mechanism Studies	V-98
V.D.3	Ballard Power Systems: Accelerated Testing Validation	V-109
V.D.5	Ballard Power Systems: Development of Micro-Structural Mitigation Strategies for PEM Fuel Cells: Morphological Simulations and Experimental Approaches	V-121
V.D.5	Queen's University: Development of Micro-Structural Mitigation Strategies for PEM Fuel Cells: Morphological Simulations and Experimental Approaches	V-121
V.E.2	Ballard Power Systems: The Effect of Airborne Contaminants on Fuel Cell Performance and Durability	V-135
V.G.3	Ballard Power Systems: Roots Air Management System with Integrated Expander	V-170
V.H.7	Ballard Power Systems: A Total Cost of Ownership Model for Design and Manufacturing Optimization of Fuel Cells in Stationary and Emerging Market Applications	V-207
VII.9	Hydrogenics Corporation: Data Collection and Validation of Newport Beach Hydrogen Station Performance	VII-41

Canada (Continued)

VII.10 Hydrogenics Corporation: California State University Los Angeles Hydrogen Refueling Facility Performance Evaluation and Optimization VII-43

France

V.D.3 Université de Lorraine: Accelerated Testing Validation V-109

Germany

V.A.10 Technical University Berlin: High-Activity Dealloyed Catalysts V-61
 V.I.2 SFC Energy: Advanced Materials and Concepts for Portable Power Fuel Cells V-220

Israel

V.L.1 CellEra, Inc.: Advanced Ionomers and MEAs for Alkaline Membrane Fuel Cells V-235

Japan

III.2 Mitsubishi Heavy Industries, Ltd: Oil-Free Centrifugal Hydrogen Compression Technology Demonstration III-16

South Korea

V.A.11 Yonsei University: Development of Ultra-Low Platinum Alloy Cathode Catalyst for Polymer Electrolyte Membrane Fuel Cells. V-68

United Kingdom

II.A.1 Parker Hannifin Ltd domnick hunter Division: PEM Electrolyzer Incorporating an Advanced Low-Cost Membrane II-11
 V.A.4 Johnson Matthey Fuel Cells: Contiguous Platinum Monolayer Oxygen Reduction Electrocatalysts on High-Stability Low-Cost Supports V-26
 V.A.10 Johnson Matthey Fuel Cells: High-Activity Dealloyed Catalysts V-61
 V.C.2 Johnson Matthey Fuel Cells: Rationally Designed Catalyst Layers for PEMFC Performance Optimization. V-95
 V.F.4 Johnson Matthey Fuel Cells: Transport Studies Enabling Efficiency Optimization of Cost-Competitive Fuel Cell Stacks V-159
 V.I.2 Johnson Matthey Fuel Cells: Advanced Materials and Concepts for Portable Power Fuel Cells V-220