## **Table of Contents**

In	troduction	1
	Evaluation Criteria - Research and Development Subprogram Projects	1
	Evaluation Criteria - Technology Integration Projects	3
	Project Scoring	6
1.	Vehicle Systems	. 1-1
	Overview of the VTO Vehicle Systems Program: Lee Slezak (U.S. Department of Energy) - vs000	1-3
	Medium- and Heavy-Duty Vehicle Field Evaluations: Ken Kelly (National Renewable Energy Laboratory) - vs001	1-15
	DOE's Effort to Improve Heavy Vehicle Fuel Efficiency through Improved Aerodynamics: Kambiz Salari (Lawrence Livermore National Laboratory) - vs006	1-18
	Idaho National Laboratory Testing of Advanced Technology Vehicles: James Francfort (Idaho National Laboratory) - vs021	1-22
	Advanced Vehicle Testing and Evaluation: Richard Jacobson (Intertek) - vs029	1-25
	Advanced Technology Vehicle Lab Benchmarking (L1 and L2): Kevin Stutenberg (Argonne National Laboratory) - vs030	1-28
	SuperTruck - Development and Demonstration of a Fuel-Efficient Class 8 Tractor and Trailer Vehicle: Russ Zukouski (Navistar International Corporation) - vs064	1-32
	Commercial Vehicle Thermal Load Reduction and VTCab-Rapid HVAC Load Estimation Tool: Jason Lustbader (National Renewable Energy Laboratory) - vs075	1-36
	Volvo SuperTruck: Pascal Amar (Volvo Trucks) - vs081	1-39
	System for Automatically Maintaining Pressure in a Commercial Truck Tire: Norm Anderson (The Goodyear Tire and Rubber Company) - vs085	1-43
	EV - Smart Grid Research and Interoperability Activities: Keith Hardy (Argonne National Laboratory) - vs095	1-47
	Wireless and Conductive Charging Testing to Support Code and Standards: Barney Carlson (Idaho National Laboratory) - vs096	1-50
	High-Efficiency, Low EMI and Positioning Tolerant Wireless Charging of EVs: Rakan Chabaan (Hyundai) - vs102	1-53
	Wireless Charging of Electric Vehicles: Omer Onar (Oak Ridge National Laboratory) - vs103	1-56
	Zero Emission Drayage Truck Demonstration (ZECT I): Matt Miyasato (SCAQMD) - vs115	1-58

Hydrogen Fuel-Cell Electric Hybrid Truck and Zero Emission Delivery Vehicle Deployment: Andrew DeCandis (Houston-Galveston Area Council) - vs1161-61
Combined Aero and Underhood Thermal Analysis for Heavy-Duty Trucks: Tanju Sofu (Argonne National Laboratory) - vs1321-64
Cummins Medium-Duty and Heavy-Duty Accessory Hybridization CRADA: Dean Deter (Oak Ridge National Laboratory) - vs1331-69
Vehicle Thermal System Modeling in Simulink: Jason Lustbader (National Renewable Energy Laboratory) - vs1341-73
Advanced Climate Systems for EV Extended Range (ACSforEVER): John Meyer (Hanon Systems) - vs1351-76
ePATHS - electrical PCM Assisted Thermal Heating System: Mingyu Wang (Mahle Behr USA, LLC) - vs1361-79
SAE J2907 Motor Power Ratings Standards Support: John Miller (Oak Ridge National Laboratory) - vs1441-82
Analyzing Real-World Light Duty Vehicle Efficiency Benefits: Jeff Gonder (National Renewable Energy Laboratory) - vs1551-85
UTEMPRA - Unitary Thermal Energy Management for Propulsion Range Augmentation: Sourav Chowdhury (Mahle Behr USA LLC) - vs1571-88
Zero Emission Cargo Transport II: San Pedro Bay Ports Hybrid and Fuel Cell Electric Vehicle Project: Joseph Impullitti (SCAQMD) - vs1581-92
Multi-Speed Transmission for Commercial Delivery Medium-Duty Plug-In Electric Drive Vehicles: Bulent Chavdar (Eaton Corporation) - vs1611-96
Integrated Boosting and Hybridization for Extreme Fuel Economy and Downsizing: Vasilios Tsourapas (Eaton Corporation) - vs1621-100
Advanced Bus and Truck Radial Materials for Fuel Efficiency: Lucas Dos Santos Freire (PPG Industries) - vs1631-103
Design and Implementation of a Thermal Load Reduction System in a Hyundai PHEV: Cory Kreutzer (National Renewable Energy Laboratory) - vs1651-107
EV Everywhere Charging Infrastructure Roadmap: Donald Karner (Electric Applications Incorporated) - vs1721-111
Energy Impact of Connected and Automated Vehicles: Huei Peng (University of Michigan) - vs1731-115
Methods to Measure, Predict, and Relate Friction, Wear, and Fuel Economy:  Steve Gravante (Ricardo) - vs1751-119
Improved Tire Efficiency through Elastomeric Polymers Enhanced with Carbon-Based Nanostructured Materials: Georgios Polyzos (Oak Ridge National Laboratory) - vs1761-123
VTO Vehicle to Building Integration Pathway: Richard Pratt (Pacific Northwest National Laboratory) - vs1811-126

	VTO Systems Research Supporting Standards and Interoperability: John Smart (Idaho National Laboratory) - vs182	1-128
	VTO Modeling and Controls Software Tools to Support V2G Integration: Samveg Saxena (Lawrence Berkeley National Laboratory) - vs183	1-131
	VTO Diagnostic Security Modules for Electric Vehicle to Building Integration: Ken Rohde (Idaho National Laboratory) - vs184	1-134
	Evaluation of Vehicle Technology Benefits on Real World Driving Cycles using Regional Transportation System Model: Aymeric Rousseau (Argonne National Laboratory) - vs185	1-136
	Evaluation of Dynamic Wireless Charging Demand: James Li (Oak Ridge National Laboratory) - vs186	1-139
2.	Electrochemical Energy Storage	2-1
	Overview of the DOE Advanced Battery R&D Program: David Howell (U.S. Department of Energy) - es000	2-4
	Materials Benchmarking Activities for CAMP Facility: Wenquan Lu (Argonne National Laboratory) - es028	2-19
	Cell Analysis, Modeling, and Prototyping (CAMP) Facility Research Activities: Andrew Jansen (Argonne National Laboratory) - es030	2-22
	Overview and Progress of United States Advanced Battery Consortium (USABC) Activity: Ron Elder (United States Advanced Battery Consortium) - es097	2-25
	Thick Low-Cost, High-Power Lithium-Ion Electrodes via Aqueous Processing: Jianlin Li (Oak Ridge National Laboratory) - es164	2-29
	Performance Effects of Electrode Coating Defects and IR Thermography NDE for High-Energy Lithium-Ion Batteries: David Wood (Oak Ridge National Laboratory) - es165	2-31
	Post-Test Analysis of Lithium-Ion Battery Materials at Argonne National Laboratory: Ira Bloom (Argonne National Laboratory) - es166	2-33
	Process Development and Scale-Up of Advanced Active Battery Materials:  Greg Krumdick (Argonne National Laboratory) - es167	2-36
	Process Development and Scale-Up of Critical Battery Materials:  Greg Krumdick (Argonne National Laboratory) - es168	2-38
	Electrochemical Performance Testing: Ira Bloom (Argonne National Laboratory) - es201	2-40
	INL Electrochemical Performance Testing: Matt Shirk (Idaho National Laboratory) - es202	2-42
	Battery Safety Testing: Leigh Anna Steele (Sandia National Laboratories) - es203	2-44
	Battery Thermal Characterization: Matthew Keyser (National Renewable Energy Laboratory) - es204	2-47

Cathodes: David Wood (Oak Ridge National Laboratory) - es2072-50
New High-Energy Electrochemical Couple for Automotive Applications: Khalil Amine (Argonne National Laboratory) - es2082-52
High-Energy High-Power Battery Exceeding PHEV-40 Requirements:  Jane Rempel (TIAX LLC) - es2092-55
Advanced High-Energy Li-Ion Cell for PHEV and EV Applications:  Jagat Singh (3M) - es2102-58
High-Energy Lithium Batteries for PHEV Applications: Subramanian Venkatachala (Envia Systems) - es2112-61
High-Energy, Long Cycle Life Lithium-Ion Batteries for EV Applications:  Donghai Wang (Pennsylvania State University) - es2122-64
High-Energy Density Li-ion Cells for EVs Based on Novel, High Voltage Cathode Material Systems: Keith Kepler (Farasis) - es2132-68
Fundamental Studies of Lithium-Sulfur Cell Chemistry: Nitash Balsara (Lawrence Berkeley National Laboratory) - es2242-71
BatPaC Model Development: Shabbir Ahmed (Argonne National Laboratory) - es2282-73
Design of Sulfur Cathodes for High-Energy Lithium-Sulfur Batteries: Yi Cui (Stanford University) - es2302-75
Efficient Rechargeable Li-O <sub>2</sub> Batteries Utilizing Stable Inorganic Molten Salt Electrolytes: Vincent Giordani (Liox) - es2332-78
Low-Cost, High-Energy Si-Graphene Anodes for Li-Ion Batteries: John Colwell (XG Sciences) - es2372-81
Low-Cost, High-Capacity Lithium Ion Batteries through Modified Surface and Microstructure: Pu Zhang (Navitas Systems) - es2382-84
Scale-Up of Low-Cost Encapsulation Technologies for High Capacity and High Voltage Electrode Powders: David King (Pneumaticoat Technologies) - es2392-86
High-Energy Anode Material Development for Li-Ion Batteries: Cary Hayner (Sinode Systems) - es2402-89
Advanced High-Performance Batteries for Electric Vehicle (EV) Applications: lonel Stefan (Amprius) - es2412-92
A Disruptive Concept for a Whole Family of New Battery Systems: Farshid Roumi (Parthian Energy) - es2422-95
Dramatically Improve the Safety Performance of Li-Ion Battery Separators and Reduce the Manufacturing Cost Using Ultraviolet Curing and High-Precision Coating Technologies: John Arnold (Miltec UV International) - es2432-99
Low-Cost, High-Capacity Non-Intercalation Chemistry Automotive Cells:  Alex Jacobs (Sila Nanotechnologies) - es244

Low-Cost, Structurally Advanced Novel Electrode and Cell Manufacturing: Billy Woodford (24M Technologies) - es245	. 2-107
Advanced Drying Process for Lower Manufacturing Cost of Electrodes:  Iftikhar Ahmad (Lambda Technologies) - es246	. 2-111
High-Energy Lithium Batteries for Electric Vehicles: Herman Lopez (Envia Systems) - es247	. 2-115
A 12V Start-Stop Li Polymer Battery Pack: Mohamed Alamgir (LG Chem Power) - es249	. 2-119
A Commercially Scalable Process for Silicon Anode Pre-Lithiation: Ionel Stefan (Amprius) - es250	.2-123
Development of Advanced High-Performance Batteries for 12V Start-Stop Vehicle Applications: Jeff Kim (Maxwell) - es251	. 2-127
Enabling High-Energy, High-Voltage Li-Ion Cells for Transportation Applications: Modeling and Analysis: Dennis Dees (Argonne National Laboratory) - es252	. 2-130
Enabling High-Energy, High-Voltage Li-Ion Cells for Transportation Applications: Project Overview: Dennis Dees (Argonne National Laboratory) - es253	.2-132
Enabling High-Energy, High-Voltage Li-Ion Cells for Transportation Applications: Materials Characterization: Dennis Dees (Argonne National Laboratory) - es254	. 2-134
Next-Generation Anodes for Lithium-Ion Batteries: Overview: Dennis Dees (Argonne National Laboratory) - es261	. 2-136
Next-Generation Anodes for Li-Ion Batteries: Fundamental Studies of Si-C Model Systems: Robert Kostecki (Lawrence Berkeley National Laboratory) - es262	.2-138
Electrodeposition for Low-Cost, Water-Based Electrode Manufacturing: Stuart Hellring (PPG Industries) - es263	2-140
Li-Ion Battery Anodes from Electrospun Nanoparticle/Conducting Polymer Nanofibers: Peter Pintauro (Vanderbilt University) - es264	. 2-143
UV Curable Binder Technology to Reduce Manufacturing Cost and Improve Performance of LIB Electrodes: John Arnold (Miltec UV International) - es265	.2-147
Co-Extrusion (CoEx) for Cost Reduction of Advanced High-Energy-and-Power Battery Electrode Manufacturing: Corie Cobb (Palo Alto Research Center) - es266	. 2-151
Commercially Scalable Process to Fabricate Porous Silicon: Peter Aurora (Navitas Systems) - es267	. 2-155
Low-Cost Manufacturing of Advanced Silicon-Based Anode Materials:  Aaron Feaver (Group14) - es268	. 2-160
An Integrated Flame Spray Process for Low-Cost Production of Battery Materials: Chad Xing (University of Missouri) - es269	2-165
New Advanced Stable Electrolytes for High-Voltage Electrochemical Energy Storage: Peng Du (Silatronix) - es271	. 2-169
Pre-Lithiation of Battery Electrodes: Yi Cui (Stanford University) - es272	.2-173

New Lamination and Doping Concepts for Enhanced Li-S Battery Performance: Prashant Kumta (University of Pittsburgh) - es2792-175
Novel Chemistry: Lithium Selenium and Selenium Sulfur Couple: Khalil Amine (Argonne National Laboratory) - es2802-178
Multi-Functional Cathode Additives for Li-S Battery Technology: Hong Gan (Brookhaven National Laboratory) - es2812-180
Development of High-Energy Lithium-Sulfur Batteries: Jun Liu (Pacific Northwest National Laboratory) - es2822-183
Addressing Internal "Shuttle" Effect: Electrolyte Design and Cathode Morphology Evolution in Li-S Batteries: Perla Balbuena (Texas A&M University) - es2832-186
Statically and Dynamically Stable Lithium-Sulfur Batteries: Arumugam Manthiram (University of Texas at Austin) - es2842-188
Mechanistic Investigation for the Rechargeable Li-Sulfur Batteries:  Deyang Qu (University of Wisconsin, Milwaukee) - es2852-191
Development of Novel Electrolytes and Catalysts for Li-Air Batteries: Khalil Amine (Argonne National Laboratory) - es2862-193
Exploratory Studies of Novel Sodium-Ion Battery Systems: Xiao-Qing Yang (Brookhaven National Laboratory) - es2872-195
Construction of High Energy Density Batteries: Christopher Lang (Physical Sciences, Inc.) - es2882-197
Advanced Polyolefin Separators for Li-Ion Batteries Used in Vehicle Applications: Weston Wood (Entek) - es2892-200
Hybrid Electrolytes for PHEV Applications: Surya Moganty (NOHMs Technologies) - es2902-202
SAFT-USABC 12V Start-Stop Phase II: Ian O'Connor (Saft) - es2912-205
Development of Advanced High-Performance Electrolytes for Lithium-Ion Used in Vehicle Applications: Kristin Meyers (soulbrain) - es2922-209
A Closed Loop Process for the End-of-Life Electric Vehicle Li-Ion Batteries: Yan Wang (Worcester Polytechnic Institute) - es2932-212
Computer Aided Battery Engineering Consortium: Ahmad Pesaran (National Renewable Energy Laboratory) - es294
Consortium for Advanced Battery Simulation: John Turner (Oak Ridge National Laboratory) - es2952-218
Development and Validation of a Simulation Tool to Predict the Combined Structural, Electrical, Electrochemical, and Thermal Responses of Automotive Batteries: James Marcicki (Ford Motor Company) - es296
Electric Drive Technologies 3-1
Overview of the VTO Electric Drive Technologies Program: Susan Rogers (U.S. Department of Energy) - edt0003-3

3.

Benchmarking EV and HEV Technologies: Tim Burress (Oak Ridge National Laboratory) - edt0063-13
Development of Radically Enhanced alnico Magnets (DREaM) for Traction Drive Motors: Iver Anderson (Ames Laboratory) - edt015
North American Supply Chain for Traction Motors and PE: Christopher Whaling (Synthesis Partners) - edt032
Advanced Packaging Technologies and Designs: Zhenxian Liang (Oak Ridge National Laboratory) - edt0493-23
Electric Drive Inverter R&D: Madhu Chinthavali (Oak Ridge National Laboratory) - edt053
Innovative Technologies for Converters and Chargers: Gui-Jia Su (Oak Ridge National Laboratory) - edt0543-29
Advanced Low-Cost SiC and GaN Wide Bandgap Inverters for Under-the-Hood Electric Vehicle Traction Drives: Kraig Olejniczak (Wolfspeed) - edt0583-32
High Temperature DC-Bus Capacitor Cost Reduction and Performance Improvements: Angelo Yializis (Sigma Technologies International) - edt059
High-Performance DC Bus Film Capacitor: Dan Tan (General Electric) - edt0603-38
Advanced Electric Motor Research: Tim Burress (Oak Ridge National Laboratory) - edt062
Performance and Reliability of Bonded Interfaces for High-Temperature Packaging: Doug DeVoto (National Renewable Energy Laboratory) - edt0633-45
Electric Motor Thermal Management R&D: Kevin Bennion (National Renewable Energy Laboratory) - edt0643-48
High-Efficiency High-Density GaN-Based 6.6 kW Bidirectional On-Board Charger for PEVs: Charles Zhu (Delta Products Corporation) - edt0673-51
Gate Driver Optimization for WBG Applications: Nance Ericson (Oak Ridge National Laboratory) - edt0683-55
Power Electronics Thermal Management R&D: Gilbert Moreno (National Renewable Energy Laboratory) - edt0693-58
Thermal Performance Benchmarking: Xuhui Feng (National Renewable Energy Laboratory) - edt0703-60
Electric Motor Performance Improvement Techniques: Lixin Tang (Oak Ridge National Laboratory) - edt071
88 Kilowatt Automotive Inverter with New 900 Volt Silicon Carbide MOSFET Technology: Jeffrey Casady (Cree) - edt073
Advanced Combustion Engines4-1
Overview of the VTO Advanced Combustion Engine R&D Program: Gurpreet Singh (U.S. Department of Energy) - ace0004-4

4.

Heavy-Duty Combustion Modeling: Mark Musculus
(Sandia National Laboratories) - ace0014-14
Light-Duty Diesel Combustion: Stephen Busch (Sandia National Laboratories) - ace0024-17
Low-Temperature Gasoline Combustion (LTGC) Engine Research:  John Dec (Sandia National Laboratories) - ace0044-22
Spray Combustion Cross-Cut Engine Research: Lyle Pickett (Sandia National Laboratories) - ace0054-26
Gasoline Combustion Fundamentals: Isaac Ekoto (Sandia National Laboratories) - ace0064-30
Large Eddy Simulation (LES) Applied to Advanced Engine Combustion Research: Joe Oefelein (Sandia National Laboratories) - ace007
Fuel Injection and Spray Research Using X-Ray Diagnostics: Christopher Powell (Argonne National Laboratory) - ace0104-36
Advances in High-Efficiency Gasoline Compression Ignition: Steve Ciatti (Argonne National Laboratory) - ace0114-40
Model Development and Analysis of Clean and Efficient Engine Combustion: Russell Whitesides (Lawrence Livermore National Laboratory) - ace0124-42
Chemical Kinetic Models for Advanced Engine Combustion: Bill Pitz (Lawrence Livermore National Laboratory) - ace0134-46
2016 KIVA-hpFE Development: A Robust and Accurate Engine Modeling Software: David Carrington (Los Alamos National Laboratory) - ace0144-49
Stretch Efficiency for Combustion Engines: Exploiting New Combustion Regimes: Stuart Daw (Oak Ridge National Laboratory) - ace0154-52
High-Efficiency Clean Combustion in Multi-Cylinder Light-Duty Engines: Scott Curran (Oak Ridge National Laboratory) - ace016
Accelerating Predictive Simulation of IC Engines with High Performance Computing: Kevin Edwards (Oak Ridge National Laboratory) - ace0174-60
Joint Development and Coordination of Emissions Control Data and Models (CLEERS Analysis and Coordination): Stuart Daw (Oak Ridge National Laboratory) - ace022
CLEERS: Aftertreatment Modeling and Analysis: Yong Wang (Pacific Northwest National Laboratory) - ace0234-69
Ash-Durable Catalyzed Filters for Gasoline Direct Injection (GDI) Engines: Hee Je Seong (Argonne National Laboratory) - ace0244-73
Enhanced High- and Low-Temperature Performance of NO <sub>x</sub> Reduction Materials: Feng Gao (Pacific Northwest National Laboratory) - ace0264-77
Next Generation SCR-Dosing System Investigation: Abhijeet Karkamkar (Pacific Northwest National Laboratory) - ace027

Cummins-ORNL\FEERC Emissions CRADA: $NO_x$ Control and Measurement Technology for Heavy-Duty Diesel Engines, Self-Diagnosing Smart Catalyst Systems: Bill Partridge (Oak Ridge National Laboratory) - ace0324-85
Emissions Control for Lean Gasoline Engines: Jim Parks (Oak Ridge National Laboratory) - ace0334-90
Neutron Imaging of Advanced Transportation Technologies: Todd Toops (Oak Ridge National Laboratory) - ace052
RCM Studies to Enable Gasoline-Relevant Low-Temperature Combustion: Scott Goldsborough (Argonne National Laboratory) - ace054
Fuel-Neutral Studies of Particulate Matter Transport Emissions:  Mark Stewart (Pacific Northwest National Laboratory) - ace0564-100
SuperTruck - Development and Demonstration of a Fuel-Efficient Class 8 Tractor and Trailer, Engine Systems: Russ Zukouski (Navistar International Corporation) - ace059
Volvo SuperTruck - Powertrain Technologies for Efficiency Improvement: Pascal Amar (Volvo Trucks) - ace060
Advancements in Fuel Spray and Combustion Modeling with High-Performance Computing Resources: Sibendu Som (Argonne National Laboratory) - ace0754-113
Improved Solvers for Advanced Engine Combustion Simulation: Matthew McNenly (Lawrence Livermore National Laboratory) - ace076 4-116
Cummins-ORNL\FEERC Combustion CRADA: Characterization and Reduction of Combustion Variations: Bill Partridge (Oak Ridge National Laboratory) - ace0774-120
Thermally Stable Ultra-Low Temperature Oxidation Catalysts: Janos Szanyi (Pacific Northwest National Laboratory) - ace0784-123
High-Efficiency GDI Engine Research, with Emphasis on Ignition Systems: Thomas Wallner (Argonne National Laboratory) - ace0844-127
Low-Temperature Emission Control to Enable Fuel-Efficient Engine Commercialization: Todd Toops (Oak Ridge National Laboratory) - ace0854-129
High-Dilution Stoichiometric Gasoline Direct-Injection (SGDI) Combustion Control Development: Brian Kaul (Oak Ridge National Laboratory) - ace090 4-133
High-Efficiency VCR Engine with Variable Valve Actuation and New Supercharging Technology: Charles Mendler (Envera LLC) - ace092 4-136
Lean Miller Cycle System Development for Light-Duty Vehicles:  David Sczomak (General Motors) - ace0934-142
Ultra-Efficient Light-Duty Powertrain with Gasoline Low-Temperature Combustion: Keith Confer (Delphi Advanced Powertrain) - ace0944-146
Metal Oxide Nano-Array Catalysts for Low-Temperature Diesel Oxidation: Pu-Xian Gao (University of Connecticut) - ace095

	Micro-Jet Enhanced Ignition with a Variable Orifice Fuel Injector for High- Efficiency Lean-burn Combustion: Chia-Fon Lee (University of Illinois) - ace096	4-154
	Affordable Rankine Cycle (ARC) Waste Heat Recovery for Heavy-Duty Trucks: Swami Subramanian (Eaton Corporation) - ace097	4-157
	Cummins 55% BTE Project: Lyle Kocher (Cummins) - ace098	4-161
	Improved Fuel Efficiency through Adaptive Radio Frequency Controls and Diagnostics for Advanced Catalyst Systems: Alexander Sappok (Filter Sensing Technologies, Inc.) - ace099	4-166
5.	Fuel and Lubricant Technologies	5-1
	Overview of the VTO Fuel and Lubricant Technologies R&D: Kevin Stork (U.S. Department of Energy) - ft000	5-4
	Engine Friction Reduction Technologies: George Fenske (Argonne National Laboratory) - ft012	5-12
	Ionic Liquids as Engine Lubricant Additives, Impact on Emission Control Catalysts, and Compatibility with Coatings: Jun Qu (Oak Ridge National Laboratory) - ft014	5-15
	Integrated Friction Reduction Technology to Improve Fuel Economy without Sacrificing Durability: Stephen Hsu (George Washington University) - ft033	5-18
	Hybrid Ionic-Nano-Additives for Engine Lubrication to Improve Fuel Efficiency: Bin Zhao (University of Tennessee) - ft034	5-21
	Hyperbranched Alkanes for Lubes: Lelia Cosimbescu (Pacific Northwest National Laboratory) - ft035	5-24
	Lubricant Effects on Combustion, Emissions, and Efficiency: Robert Wagner (Oak Ridge National Laboratory) - ft036	5-27
	Co-Optimization of Fuels and Engines Overview: John Farrell (National Renewable Energy Laboratory) - ft037	5-30
	Co-Optimization of Fuels and Engines (Co-Optima) Fuel Properties and Thrust I Engine Research: Jim Szybist (Oak Ridge National Laboratory) - ft038	5-35
	Co-Optimization of Fuels and Engines (Co-Optima) Thrust II Engine Research, Sprays Research, and Emissions Control Research: Paul Miles (Sandia National Laboratories) - ft039	5-41
	Co-Optimization of Fuels and Engines (Co-Optima) Simulation Toolkit Team: Matt McNenly (Lawrence Livermore National Laboratory) - ft040	5-45
	Utilizing Alternative Fuel Ignition Properties to Improve Spark-Ignited and Compression-Ignited Engine Efficiency: Margaret Wooldridge (University of Michigan) - ft042	5-51
	E85/Diesel Premixed Compression Ignition: Lyle Kocher (Cummins) - ft043	5-56
	GEFORCE: Gasoline Engine and Fuels Offering Reduced Fuel Consumption and Emissions: Scott Sluder (Oak Ridge National Laboratory) - ft044	5-60
	GDI Metrics: Scott Goldsborough (Argonne National Laboratory) - ft045	5-64

	Efficiency-Optimized Dual Fuel Engine with In-Cylinder Gasoline/CNG Blending: Thomas Wallner (Argonne National Laboratory) - ft046	.5-68
6.	Lightweight Materials	6-1
	Subprogram Overview Comments: Felix Wu (U.S. Department of Energy) - Im000	6-3
	Scale-Up of Magnesium Production by Fully Stabilized Zirconia Electrolysis: Adam Powell (INFINIUM, Inc.) - Im035	. 6-13
	Integrated Computational Materials Engineering Approach to Development of Lightweight 3GAHSS Vehicle Assembly: Lou Hector (United States Automotive Materials Partnership LLC) - Im080	.6-16
	Validation of Material Models for Crash Simulation of Automotive Carbon Fiber Composite Structures (VMM): Libby Berger (General Motors) - Im084	.6-19
	Collision Welding of Dissimilar Materials by Vaporizing Foil Actuator: A Breakthrough Technology for Dissimilar Materials Joining: Glenn Daehn (Ohio State University) - Im086	6-23
	Active, Tailorable Adhesives for Dissimilar Material Bonding, Repair and Assembly: Mahmood Haq (Michigan State University) - Im087	6-26
	High-Strength Electroformed Nanostructured Aluminum for Lightweight Automotive Applications: Robert Hilty (Xtalic Corporation) - Im089	. 6-29
	Vehicle Lightweighting: Mass Reduction Spectrum Analysis and Process Cost Modeling: Tony Mascarin (IBIS Associates) - Im090	. 6-32
	Laser-Assisted Joining Process of Aluminum and Carbon Fiber Components: Adrian Sabau (Oak Ridge National Laboratory) - Im097	. 6-36
	Brazing Dissimilar Metals with a Novel Composite Foil: Tim Weihs (Johns Hopkins University) - Im098	. 6-39
	High-Strength, Dissimilar Alloy Aluminum Tailor-Welded Blanks: Yuri Hovanski (Pacific Northwest National Laboratory) - Im099	. 6-43
	Upset Protrusion Joining Techniques For Joining Dissimilar Metals: Steve Logan (Fiat Chrysler Automobiles US LLC) - Im100	. 6-46
	Integrated Computational Materials Engineering (ICME) Development of Carbon Fiber Composites for Lightweight Vehicles: Xuming Su (Ford Motor Company) - Im101	. 6-49
	Predictive Models for Integrated Manufacturing and Structural Performance of Carbon Fiber Composites for Automotive Applications: Venkat Aitharaju (General Motors) - Im102	.6-52
	E. Coli Derived Spider Silk MaSp1 and MaSp2 Proteins as Carbon Fiber Precursors: Randy Lewis (Utah State University) - Im103	. 6-55
	Solid-State Body-in-White Spot Joining of Al to AHSS at Prototype Scale: Zhili Feng (Oak Ridge National Laboratory) - Im104	.6-58
	Friction Stir Scribe Joining of Al to Steel: Yuri Hovanski (Pacific Northwest National Laboratory) - Im105	.6-60

	Enhanced Sheared Edge Stretchability of AHSS/UHSS: Xin Sun (Pacific Northwest National Laboratory) - Im106	6-63
	Optimizing Heat Treatment Parameters for 3 <sup>rd</sup> Generation AHSS Using an Integrated Experimental-Computational Framework: Xin Sun (Pacific Northwest National Laboratory) - Im107	. 6-65
	Development of Low-Cost, High-Strength Automotive Aluminum Sheet: Russell Long (Alcoa) - Im108	.6-68
7.	Propulsion Materials	.7-1
	Overview of VTO Material Technologies: Jerry Gibbs (U.S. Department of Energy) - pm000	. 7-3
	Novel Manufacturing Technologies for High-Power Induction and Permanent Magnet Electric Motors: Glenn Grant (Pacific Northwest National Laboratory) - pm004	.7-15
	Materials Issues Associated with EGR Systems: Michael Lance (Oak Ridge National Laboratory) - pm009	. 7-22
	High-Temperature Materials for High-Efficiency Engines: Govindarajan Muralidharan (Oak Ridge National Laboratory) - pm053	.7-26
	Enabling Materials for High-Temperature Power Electronics: Andrew Wereszczak (Oak Ridge National Laboratory) - pm054	. 7-28
	Biofuel Impacts on Aftertreatment Devices: Michael Lance (Oak Ridge National Laboratory) - pm055	.7-31
	Applied Computational Methods for New Propulsion Materials: Charles Finney (Oak Ridge National Laboratory) - pm057	.7-34
	Development of Advanced High-Strength Cast Alloys for Heavy-Duty Engines: Rich Huff (Caterpillar) - pm059	.7-39
	ICME Guided Development of Advanced Cast Aluminum Alloys for Automotive Engine Applications: Mei Li (Ford Motor Company) - pm060	. 7-44
	Computational Design and Development of a New, Lightweight Cast Alloy for Advanced Cylinder Heads in High-Efficiency, Light-Duty Engines: Mike Walker (General Motors) - pm061	. 7-51
	High-Performance Cast Aluminum Alloys for Next Generation Passenger Vehicle Engines: Amit Shyam (Oak Ridge National Laboratory) - pm062	. 7-57
	Development of High-Performance Cast Crankshafts: Rich Huff (Caterpillar) - pm065	. 7-61
	Innovative SCR Materials and Systems for Low-Temperature Aftertreatment: Yong Wang (Pacific Northwest National Laboratory) - pm066	. 7-64
	Next Generation Three-Way Catalysts for Future, Highly Efficient Gasoline Engines: Christine Lambert (Ford Motor Company) - pm067	. 7-68
	Sustained Low-Temperature NO <sub>x</sub> Reduction (SLTNR):	7-73

8.	Technology Integration	8-1
	Subprogram Overview Comments: Linda Bluestein (U.S. Department of Energy) - ti000	8-4
	Plug-In Hybrid Electric Vehicle Demonstration Program and Social Media Campaign: Lizabeth Ardisana (ASG Renaissance) - ti064	8-13
	Drive Electric Orlando: April Combs (Florida Department of Agriculture and Consumer Services/Office of Energy) - ti065	8-17
	Alternative Fuel Vehicle Curriculum Development and Outreach Initiative: Judy Moore (West Virginia University Research Corporation) - ti066	8-21
	Nationwide AFV Emergency Responder, Recovery, Reconstruction and Investigation Training: Andrew Klock (National Fire Protection Association) - ti067	8-25
	Safe Alternative Fuels Deployment in Mid-America (The SAF-D Project): Kelly Gilbert (Metropolitan Energy Center, Inc.) - ti068	8-29
	Initiative for Resiliency in Energy through Vehicles (IREV): Cassie Powers (National Association of State Energy Officials) - ti069	8-33
	EcoCAR 3: Kristen Wahl (Argonne National Laboratory) - ti070	8-38
9.	Vehicle Analysis	9-1
	Subprogram Overview Comments: Jake Ward (U.S. Department of Energy) - van999	9-3
	Transportation Data Program: A Multi-Lab Coordinated Project: Stacy Davis (Oak Ridge National Laboratory) - van016	9-10
	ANL Vehicle Technologies Analysis Modeling Program: Michael Wang (Argonne National Laboratory) - vanO17	9-14
	VTO Program Benefits Analysis: Tom Stephens (Argonne National Laboratory) - van018	9-18
	Assessing Energy and Cost Impact of Advanced Technologies through Model-Based Design: Aymeric Rousseau (Argonne National Laboratory) - vanO23	ດ_ວວ
10		
10. Acronyms10-1		
Appendix A: 2016 Annual Merit Review Attendees		