

Draft as of 6/27/2016
17th Annual Solid Oxide Fuel Cell (SOFC) Project Review Meeting
Pittsburgh Airport Marriott Hotel, Pittsburgh, PA
July 19-21, 2016

Tuesday July 19, 2016

8:00 – 9:00 a.m. Registration
Continental Breakfast

General Session

Opening Session Moderator: Joseph Stoffa, U.S. DOE, NETL

9:00 – 9:35 am NETL’s Fuel Cell Program Overview
Shailesh Vora, Fuel Cells R&D Portfolio Manager
U.S. Department of Energy, National Energy Technology Laboratory

9:35 – 10:05 am ARPA-E’s REBELS Program Overview
Paul Albertus and Grigorii Soloveichik, Program Directors for REBELS
U.S. Department of Energy, ARPA-E

10:05-10:30 am System Analysis of Fuel Cell Plant Configurations with Vent Gas
Recirculation
Greg Hackett, National Energy Technology Laboratory (25 min)

10:30 – 10:45 am **BREAK**

SOFC Industry Moderator: Joseph Stoffa, U.S. DOE, NETL
Teams

10:45 – 11:30 am Project Update from FuelCell Energy (FE23186, FE26093, FE26199)
TBD, FuelCell Energy, Inc.

11:30 – 12:15 pm Project Update from LG Fuel Cell Systems (FE23337, FE12077, FE26098)
TBD, LG Fuel Cell Systems Inc.

12:15 – 1:30 pm **LUNCH**

SOFC Core Projects: Reliability, Robustness, and Endurance SOFC

Moderator: Patcharin Burke, U.S. DOE, NETL

1:30 –3:10pm

Mitigation of Chromium Impurity Effects and Degradation in Solid Oxide Fuel Cells: Understanding Transport and Thermodynamics (FE23325)
Srikanth Gopalan, Boston University (25 min)

Materials and Approaches for the Mitigation of SOFC Cathode Degradation in SOFC Power Systems (FE23385)

Prabhakar Singh, University of Connecticut (25 min)

Long-Term Degradation of LSM-Based SOFC Cathodes:

Use of a Proven Accelerated Test Regimen (FE23476)

Mark De Guire, Case Western Reserve University (25 min)

SOFC Quality Control and the Role of Manufacturing Defects on Stack Reliability (FE23478)

Neil Fernandes, Acumentrics SOFC Corp (25 min)

3:10 – 3:25 pm

BREAK

ARPA-E REBELS Projects: IT Fuel Cells for DG

3:25 – 4:40 pm

Low Temperature Solid Oxide Fuel Cells for Transformational Energy Conversion

Bryan Blackburn, Redox Power Systems (25 min)

Development of an Intermediate Temperature Metal Supported Proton Conducting Solid Oxide Fuel Cell Stack

Dave Tew, UTRC (25 min)

Nanocomposite Electrodes for a Solid Acid Fuel Cell Stack Operating on Reformate

Tom Zawodzinski, ORNL and Alex Papandrew , UT- Knoxville (25 min)

4:40 pm

ADJOURN

4:45 –6:30 pm

Poster Session

Wednesday July 20, 2016

7:00-8:00 am Registration –
Continental Breakfast – Coraopolis, Findley and Moon Rooms

General Session

National Labs Moderator: Patcharin Burke, U.S. DOE, NETL

8:00– 10:00 am NETL R&D: SOFC Materials Development and Degradation Modeling
Greg Hackett, National Energy Technology Laboratory (30 min)

Reliability of Materials and Components for SOFCs- ORNL (FEAA121)
Edgar Lara-Curzio, Oak Ridge National Lab (30 min)

Evaluation of Feedstock Materials for SOFC Performance Reliability
(FWP20089)
Brian Ingram, Argonne National Lab (30 min)

SOFC Development at PNNL: Overview – PNNL (FWP66841)
Jeff Stevenson and Brian Koepfel, Pacific Northwest National Lab (30 min)

10:00 – 10:15 am **BREAK**

SOFC Core projects: Reliability, Robustness, and Endurance SOFC

Moderator: Arun Bose, U.S. DOE, NETL

10:15 – 11:55 am Durable, Impermeable Brazes for Solid Oxide Fuel Cells (FE23315)
Jason D. Nicholas, Michigan State University (25 min)

Cost-Effective Manufacturing and Morphological Stabilization of
Nanostuctured Cathodes for Commercial SOFCs (FE23317)
Ray Gorte, University of Pennsylvania (25 min)

Development and Characterization of High Performance and Robust Mixed
Conducting Cathodes Supportive of Lower Cost SOFCs (FE26097, FE23475)
Xiao-Dong Zhou, University of South Carolina (25 min)

Scalable and Cost-Effective Barrier Layer Coating to Improve Stability and
Performance of SOFC Cathodes (FE23047)
Xingbo Liu, West Virginia University (25 min)

11:55 – 1:30 pm **LUNCH**

**ARPA-E REBELS Projects: Load following IT Fuel Cells and
Liquid Fuel-Producing IT Fuel Cells**

Moderator: Seth Lawson, U.S. DOE, NETL

1:30 –3:10 pm Intermediate Temperature Proton Conducting Fuel Cells for Transportation Applications
S. Elangovan, Ceramatec (25 min)

Fuel Cells with Dynamic Response Capability Based on Energy Storage Electrodes with Catalytic Function
Yunfeng Lu, UCLA (25 min)

A Novel Intermediate-Temperature Bifunctional Ceramic Fuel Cell Energy System
Kevin Huang , University of South Carolina (25 min)

Intermediate-Temperature Electrogenerative Cells for Flexible Cogeneration of Power and Liquid Fuel
Greg Tao, MSRI (25 min)

3:10 – 3:25 pm **BREAK**

SOFC Projects: Innovative Concepts

3:25 – 4:20 pm Development of a Thermal Spray Redox Stable, Ceramic Anode for Metal Supported SOFC (FE26169)
Richard Hart, General Electric Company (30 min)

SOFC Core Projects: Reliability, Robustness, and Endurance SOFC

Processing of SOFC Anodes for Enhanced Intermediate Temperature Catalytic Activity at High Fuel Utilization (FE26096)
Somanendra Basu, Boston University (25 min)

4:20 pm **ADJOURN**

Thursday July 21, 2016

7:00-8:00 am Registration
Continental Breakfast

General Session

SOFC Core Projects: Reliability, Robustness, and Endurance SOFC

Moderator: Steve Markovich, U.S. DOE, NETL

8:00– 10:30 am Low-Cost, Durable, Contaminant-Tolerant Cathodes for SOFC
(FE26106, FE9652)
Meilin Liu, Georgia Tech (25 min)

In-Operando Evaluation of SOFC Cathodes for Enhanced Oxygen Reduction
Reaction Activity and Durability (FE26190)
Eric Wachsman, University of Maryland (25 min)

Surface-Modified Electrodes: Enhancing Performance Guided by In-situ
Spectroscopy and Microscopy (FE9620)
William Chueh, Stanford University (25 min)

Enhancing high Temperature Anode Performance with 2 Degree Anchoring
Phases (FE26192)
Robert Walker, Montana State University (25 min)

Novel Nanostructure Tailored Highly Active & Stable Electro-catalytic
Architecture on Surface of Cathode of SOFCs. (FE23386)
Xueyan Song, West Virginia University (25 min)

Matrix study of aged SOFC performance and materials degradation
(FE26095)
Neil Fernandes, Acumentrics SOFC Corp (25 min)

10:30 – 10:45 am **BREAK**

ARPA-E REBELS Projects: Liquid Fuel-Producing IT Fuel Cells

10:45 – 11:35 pm Dual Mode Intermediate Temperature Fuel Cell: Liquid Fuels and Electricity
Carl Willman, FuelCell Energy (25 min)

Intermediate Temperature Hybrid Fuel Cell System for the Conversion of
Natural Gas to Electricity and Liquid Fuels

Ted Krause, Argonne National Lab (25 min)

11:35 – 1:00 pm **LUNCH**

Moderator: Arun Bose, U.S. DOE, NETL

ARPA-E REBELS Projects: IT Fuel Cells for DG

1:00 – 1:25 pm A Novel Intermediate-Temperature Fuel Cell Tailored for Efficient Utilization of Methane
Meilin Liu, Georgia Tech (25 min)

SOFC Projects: Innovative Concepts

1:25-1:55 pm High Power, Low Cost SOFC Stacks for Robust and Reliable Distributed Generator (FE26189)
Bryan Blackburn, Redox Power Systems (30 min)

SOFC Core Projects: Reliability, Robustness, and Endurance SOFC

1:55 – 3:10 pm Development of Low-Cost, High-Sinterable, Co-Free (Ni, Fe)₃O₄ Spinel-Based Contact Materials for SOFC Cathode-side Contact Application (FE26210)
Jiahong Zhu, Tennessee Technological University (25 min)

LSCF-CDZ Composite Cathodes for Improved SOFC Electrical Performance (FE26168)
Gianfranco DiGiuseppe, Kettering University (25 min)

Scalable Nano-Scaffold Architecture on the Internal Surface of SOFC Anode for Direct Hydrocarbon Utilization (FE26167)
Xueyan Song, West Virginia University (25 min)

3:10 pm **WORKSHOP CLOSES**