

# BUSINESS AND TECHNOLOGY STRATEGIES (BTS)

## SUBJECT MATTER EXPERTS

\*Jim Spiers, Russell Tucker, Craig Miller, Paul McCurley, Venkat Banunarayanan, Tim Heidel and Paul Breakman can address questions on all topic areas.

### Analytics, Resiliency & Reliability

*David Pinney*

- Dynamic and Static Modeling
- Volt-VAR Optimization, Solar, DR, and Storage Planning Models and Innovative Co-op Deployments
- Cost and Engineering Analysis of Distributed Energy Resources
- Software Development and Database Design

*Madelyn Roche*

- Co-op Distribution Data
- G&T Co-op Data
- G&T Equity and Capex Survey

*Michael Leitman*

- Demographic Analysis
- Co-op Economies & Development
- Policy & Regulatory Analysis

### Cyber Security

*Cynthia Hsu*

- Business Drivers for Cyber Security
- Developing Cyber Security Plans
- Cyber Security Self Assessments
- Cyber Security Training
- Security Risk Management and Policy
- Security Operations

*George Walker*

- Threat Modeling
- Security Architecture
- Computer Network Defense

*Tony Thomas, Thomas Gwinn*

- Cyber Security for Industrial Control Systems

### Distributed Energy Resources

*Keith Dennis, Brian Sloboda, TJ Kirk and Michael Leitman, Kaley Lockwood*

- Beneficial Electrification
- Measurement and Verification
- Pre-Pay Programs
- Electric Vehicles
- DSM Business Models (direct load, behavioral, time of use rates)
- Home Automation:
- 111-D Impact and Using EE/DSM to meet targets

*Andrew Cotter, TJ Kirk, Paul Carroll, Doug Danley, Dale Bradshaw, Michael Leitman, Kaley Lockwood*

- Solar PV Technical and Economic Assessment
- Energy Storage Systems, Current State and Future
- Renewable Generation and Integration
- Developing Solar Strategies
- The Consumer-Centric Utility
- Co-op Renewable Resources

*Doug Danley, Paul Carroll, Debra Roepke, Andrew Cotter, TJ Kirk, Kaley Lockwood*

- SUNDA/Co-op Solar

### Generation, Environment & Carbon

*Dan Walsh, Dale Bradshaw*

- Asset Management
- Carbon capture & utilization
- Multi-pollutant control technologies for power plants
- Impact of cycling on power plants
- Integrated Test Center— Carbon (ITC-C)
- 111-D and Future of Power Plants
- EPA MATS Mercury Air Toxics Standards
- EPA RHR Regional Haze Rule
- EPA CCR Coal Combustion Residuals
- EPA ELG Water Effluent Limitation Guidelines
- EPA 316(b) Cooling Water Intake Structures
- Fast and flexible generation options
- Utility scale energy storage
- Natural gas-fired combined cycle gas turbines
- Utility scale wind energy
- Utility scale solar energy

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### Generation, Environment & Carbon cont.

#### *Lauren Khair*

- Policy & Data Analysis
- EIA-860: Annual Generator Report Data
- EIA-861: Annual Electric Power Industry Report Data
- EIA-923: Power Plant Operations Report Data

#### *Katherine Loving*

- Geographic Information Systems (GIS)
- Spatial Data Analysis

#### *Joseph Goodenbery*

- Economic Modeling
- Policy Impacts
- Levelized Cost of Energy

### Transmission & Distribution

#### *Tom Lovas, TJ Kirk, Alvin Razon*

- Energy Storage Systems Technology
- Impacts of High-Penetration Solar
- Smart Grid Demonstration Project
- Substation of the Future
- Technology Developments – T&D Systems
- DER Economics and DSO Considerations
- Unmanned Aerial Vehicles
- Conservation Voltage Reduction

#### *Tony Thomas, Thomas Gwinn, Alvin Razon*

- Product Quality and Reliability Benchmarking
- Utility Automation Systems
- Communication Networks
- MultiSpeak®
- Cyber Security for Industrial Control Systems

#### *Patti Metro*

- NERC Regulations and Standards
- FERC/NERC Grid Reliability Standards, Compliance and Enforcement
- Rural Utilities Services (RUS) and NRECA Transmission & Distribution Engineering Committee (TDEC)
- Avian Issues
- Geomagnetic Disturbance (GMD) and Electromagnetic Pulse (EMP)

#### *Robert Harris, Thomas Gwinn*

- IEEE 1547– DER Interconnection
- National Electrical Safety Code
- National Electrical Code
- System Planning
- Rural Utilities Services (RUS) and NRECA Transmission & Distribution Engineering Committee (TDEC)

### Resource Adequacy & Markets

#### *Paul McCurley, Patti Metro*

- Resource Adequacy
- Power System Planning and Operations
- Electricity Markets
- RTOs/ISOs
- Reliability

#### *Lauren Khair*

- Economic Modeling
- EIA: Short Term Energy Outlook Forecasts
- EIA: Annual Energy Outlook Projections
- Energy Imbalance Market (EIM)

#### *Joseph Goodenbery*

- Economic Modeling and Forecasting
- Market Fundamentals
- Economic Drivers of Co-op Performance
- Policy Analysis

# BUSINESS AND TECHNOLOGY STRATEGIES (BTS)

## WORK GROUPS

BTS Work Group	Work Groups	Mobile Phone	Email
Analytics, Resiliency & Reliability (A/R/R)	David Pinney- Lead Venkat Banunarayanan Paul Breakman Paul Carroll Robert Harris Lauren Khair Michael Leitman Tom Lovas Katherine Loving Patti Metro Alvin Razon Madelyn Roche Tony Thomas George Walker	607-339-3506 703-907-6129 703-907-5844 301-785-0337 571-205-3189 703-907-6845 703-907-5864 907-345-5116 703-907-5833 571-334-8890 703-907-6248 703-907-6147 703-850-4718 571-249-9540	david.pinney@nreca.coop venkat.banunarayanan@nreca.coop paul.breakman@nreca.coop paul.carroll-contractor@nreca.coop robert.harris@nreca.coop lauren.khair@nreca.coop michael.leitman@nreca.coop tom.lovas-contractor@nreca.coop katherine.loving@nreca.coop patti.metro@nreca.coop alvin.razon@nreca.coop madelyn.roche@nreca.coop tony.thomas@nreca.coop george.walker@nreca.coop
Cyber Security (CS)	Cynthia Hsu- Lead  Robbin Christianson Maureen Gatti Robert Gibson Thomas Gwinn Alison Kennedy Lauren Khair Robert Larmouth Alvin Razon Tony Thomas George Walker	703-907-6663  703-907-5842 703-907-5853 240-463-4503 703-304-4796 703-907-5704 703-907-6845  703-907-6248 703-850-4718 571-249-9540	cynthia.hsu@nreca.coop  robbin.christianson@nreca.coop maureen.gatti-contractor@nreca.coop bob.gibson-contractor@nreca.coop thomas.gwinn@nreca.coop alison.kennedy@nreca.coop lauren.khair@nreca.coop robert.larmouth-contractor@nreca.coop alvin.razon@nreca.coop tony.thomas@nreca.coop george.walker@nreca.coop
Distributed Energy Resources (DER)	Brian Sloboda - Lead Kaley Lockwood - Second Venkat Banunarayanan Dale Bradshaw Paul Breakman Paul Carroll Andrew Cotter Doug Danley Keith Dennis Robert Gibson TJ Kirk Michael Leitman Deb Roepke	703-946-2812 703-907-5623 703-907-6129 423-304-9284 703-907-5844 703-907-6548 571-329-4594 703-907-6549 571-289-5615 240-463-4503 540-454-7839 703-907-5864 703-907-5841	brian.sloboda@nreca.coop kaley.lockwood@nreca.coop venkat.banunarayanan@nreca.coop dbradshaw@electrivation.com paul.breakman@nreca.coop paul.carroll-contractor@nreca.coop andrew.cotter@nreca.coop doug.danley@nreca.coop keith.dennis@nreca.coop bob.gibson-contractor@nreca.coop thomas.kirk@nreca.coop michael.leitman@nreca.coop debra.roepke@nreca.coop
Generation, Environment & Carbon (G/E/C)	Dan Walsh- Lead  Lauren Khair - Second Venkat Banunarayanan Dale Bradshaw Paul Breakman Katherine Loving Michael Leitman Madelyn Roche	571-205-7112  703-907-6845 703-907-6129 423-304-9284 703-907-5844 703-907-5833 703-907-5864 703-907-6147	daniel.walsh@nreca.coop  lauren.khair@nreca.coop venkat.banunarayanan@nreca.coop dbradshaw@electrivation.com paul.breakman@nreca.coop katherine.loving@nreca.coop michael.leitman@nreca.coop madelyn.roche@nreca.coop
Transmission & Distribution (T&D)	Robert Harris- Lead  TJ Kirk - Second Thomas Gwinn Tom Lovas Patti Metro Alvin Razon Brian Sloboda Tony Thomas	571-205-3189  540-454-7839 703-304-4796 907-345-5116 571-334-8890 703-907-6248 703-946-2812 703-850-4718	robert.harris@nreca.coop  thomas.kirk@nreca.coop thomas.gwinn@nreca.coop tom.lovas-contractor@nreca.coop patti.metro@nreca.coop alvin.razon@nreca.coop brian.sloboda@nreca.coop tony.thomas@nreca.coop
Resource Adequacy & Markets (RA/M)	Michael Leitman - Lead Allison Hamilton - Second Venkat Banunarayanan Paul Breakman Andrew Cotter Keith Dennis Joseph Goodenbery Thomas Gwinn Lauren Khair Patti Metro Madelyn Roche Dan Walsh	703-907-5864 703-907-5824 703-907-6129 703-907-5844 571-329-4594 571-289-5615 703-907-5893 703-304-4796 703-907-6845 571-334-8890 703-907-6147 571-205-7112	michael.leitman@nreca.coop allison.hamilton@nreca.coop venkat.banunarayanan@nreca.coop paul.breakman@nreca.coop andrew.cotter@nreca.coop keith.dennis@nreca.coop joseph.goodenbery@nreca.coop thomas.gwinn@nreca.coop lauren.khair@nreca.coop patti.metro@nreca.coop madelyn.roche@nreca.coop daniel.walsh@nreca.coop