Suggested Speakers:

Inverter and Central Controller Manufacturers [MFR]

- Yaskawa Solectria - Eric Every
- SolarEdge - Doug McDonald or Jason Bobruck
- Power Electronics - TBD
- Smarter Grid Solutions - TBD

Laboratories and Testing Groups [LAB]

- National Renewable Energy Laboratories - Michael Coddington, Kelsey Horowitz, Juliet Girdalez
- Electric Power Research Institute - Tom Key, Dave*
- Walling Energy Systems Consulting - Reigh Walling

Utility Representatives [UTIL]

- Hawaiian Electric - Mark Asano
- Pacific Gas and Electric - Phouc Tram
- National Grid - Babak Enyati, Samer Arafa

Industry Representatives [IND]

- Interstate Renewable Energy Council - Brian Lydic
- Enphase - John Berdner
- IHI Energy Storage - Ryuta Ray Saka
- GE Renewable Energy - Troy Miller
- ComRent Load Bank Solutions - Mark Siira

Questions:

- **What are smart-inverter functions? -[MFR,LAB]**
    - Describe what each function identified in IEEE 1547-2018 is and how they work:
        - Volt/VAR
        - Volt/Watt
        - Freq/Watt
        - Voltage-Ride Through
        - Frequency-Ride Through
    - What DER grid impacts are each of these functions meant to reduce? Are there any benefits that smart-inverters provide to the grid?
    - Are there setting variations within IEEE 1547-2018 that must be standardized within a region and approved by the PSC?
    - Provide examples (e.g. output curves, utility grid monitoring data, etc.) of inverter operations responding to grid events in simulations and on real circuits.
    - What are the major pros and cons of smart inverters operating in autonomy versus being supervised by some type of central utility controller? What considerations should be given to determine where plant controllers need to be used in conjunction with smart inverters? What does IEEE 1547-2018 recommend?
    - How are smart inverter settings affected based on low output and/or cloud cover?
    - What smart inverter functions can be utilized together and how are they prioritized?
    - How do smart-inverter functions impact other internal inverter protection functions such as the following:
        - Anti-Islanding
        - Self Protective OverVoltage (SPOV)
        - Voltage-Ride Through

- **How do utilities evaluate and use smart-inverters? [LAB,UTIL,MFR]**

- What smart-inverter functions have been used around the country? Have any functions been deployed in other countries? For what purposes?
- How did California and Hawaii go about standardizing their settings across their entire service territory?
- What are the major technical hurdles in implementing smart-inverter functions?
- What are the benefits and drawbacks of using smart-inverters to the utility grid in terms of costs, reliability, and/or administrative burden?
- How are technical screenings/reviews adjusted when smart-inverter functions are mandated?
- What commercial tools exist that would enable utilities to model smart inverter functionalities and come up with appropriate settings?
- What type of models/information do manufacturers provide for smart inverters in order to accurately simulate smart inverter capabilities?
- How do smart inverter functions impact existing distribution assets and automation initiatives such as the following:
  - Capacitor Bank and Voltage Regulator Switching?
  - VVO
- Future Questions:
  - Is there a way to lock smart inverter settings? How easily can these settings be changed? Is this password typically shared with developers?
  - What are the recommended testing procedures for verifying settings in the field (particularly during utility verification testing)?
  - What is involved in the UL-1741SA process for testing default smart inverter settings? How is this expected to compare to testing currently being worked on for IEEE-1547.1 (including non-default settings)?

- **How do smart-inverter functions impact developers? [LAB,IND]**
  - How can smart-inverter functions be used to defer utility upgrades?
  - What methods are available to assess and track curtailment to ensure consumers are not financially harmed from unanticipated curtailment and ensure deferral/power quality benefits from advanced inverter functions?
  - In situations where central controllers are required, will the JU expect to require a Utility-owned plant controller or an Energy Management System that communicates with the Utility and customer generation assets? How can inverters or gateways certified to 1547-2018 be used as alternative and if not why?
  - Future Questions:
    - Are there any existing systems that use smart inverter functions using a central controller and utilize a “First-In, Last-Out” curtailment queue?
    - How have other jurisdictions addressed compensation for autonomous and active curtailment functions?