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<th>17-IEPR-12</th>
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<td><strong>Project Title:</strong></td>
<td>Distributed Energy Resources</td>
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<td><strong>Document Title:</strong></td>
<td>Presentation - ROLE OF SMART INTERTERS IN DER INTEGRATION</td>
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<td><strong>Description:</strong></td>
<td>Presentation by Carmen Garralaga of SMA America</td>
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<td><strong>Filer:</strong></td>
<td>Raquel Kravitz</td>
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ROLE OF SMART INVERTERS IN DER INTEGRATION

Carmen Garralaga
SMA America
Senior Application Engineer
SMA AMERICA: A BRIEF OVERVIEW

- **SMA** is the global *market leader* for *solar inverters*, a key component of all PV plants.
- Global HQ’s in Kassel, **Germany**
- U.S. HQ’s in Rocklin (near Sacramento, California)
- Complete portfolio of solutions
- More than **+55 GW** installed worldwide
- **10+ GW** installed in North America
- Recognized many times by reputable independent organizations including numerous Intersolar Awards
- Operates the *largest PV monitoring database* in the world, Sunny Portal

**55+ GW installed worldwide**

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<th>Category</th>
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<td>Utility</td>
<td>24+</td>
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<td>Commercial</td>
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<tr>
<td>Residential</td>
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<td>Storage &amp; Energy</td>
<td>0.5+</td>
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<td>Service + O&amp;M</td>
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**Local Offices in 20 Countries**
WHY SMART INVERTERS?

- Initially solar inverters were “just” devices to convert DC power to AC power for interconnecting solar system to the utility grid and injecting as much power as possible.
- Nowadays, more renewable energy integration in the grid and the modernization of solar applications means that solar PV solutions and inverters need to be capable of:
  - Grid Management
  - Energy Management
  - Storage Systems
  - Monitoring

RESIDENTIAL SYSTEM – SMART HOMES

UTILITY SCALE SYSTEM

SMA has been a pioneer in the development of smart inverters.
HOW WE PARTICIPATE IN THE ACTION PLAN

• **SMA has been working for years in different Smart Inverter working groups:**
  - FIGII (Forum on Inverter Grid Integration Issues)
  - California Rule21
  - SIWG (Smart Inverter working group)
  - HECO Rule 14 working group
  - IEEE 2030.5 (SEP2.0/IEEE 61850/SunSpec)
  - **APS Solar Partner Program** had great success
    - Pilot program in which the utility rents homeowner rooftops and owns the PV systems. This allows APS to monitor and adjust smart features when necessary and model system behavior showing value of DERS.
    - Second phase is planned to test storage integration similar to the Solar Partner Program
SMART INVERTERS, MAIN FUNCTIONS

• The objective is to implement the ACTION PLAN for the DER integration in different phases. Phase 1 to be deployed on Sept 7th.

• Main Grid Management functions requested by RULE21 for the inverters are:
  • Anti-islanding – activated
  • Low/High Voltage Ride Through – activated
  • Low/High Frequency Ride Through – activated
  • Dynamic Volt/Var operations – activated
  • Ramp rates – activated
  • Reconnect by “soft-start” methods – activated
  • Frequency/Watt (Optional) – Implemented when available
FUTURE STEPS

• COMMUNICATIONS: Rule 21 Phase II & III
  • Monitoring and remote control of DERs from the utility
  • Forecasting local energy needs and grid optimization

• BATTERY INTEGRATION:
  • Adding storage for future deployment
  • Supporting the grid
    • Ancillary services: frequency control
  • Sustainable growth of renewable energy integration
THANK YOU!

QUESTIONS?