

## DOCKETED

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# ROLE OF SMART INVERTERS IN DER INTEGRATION



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# 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

## LOCAL OFFICES IN 20 COUNTRIES



55+ GW installed worldwide

Utility

24+ GW



Commercial

13+ GW



Residential

13+ GW



Storage & Energy

0.5+ GW Mgmt.



Service + O&M

2 GW

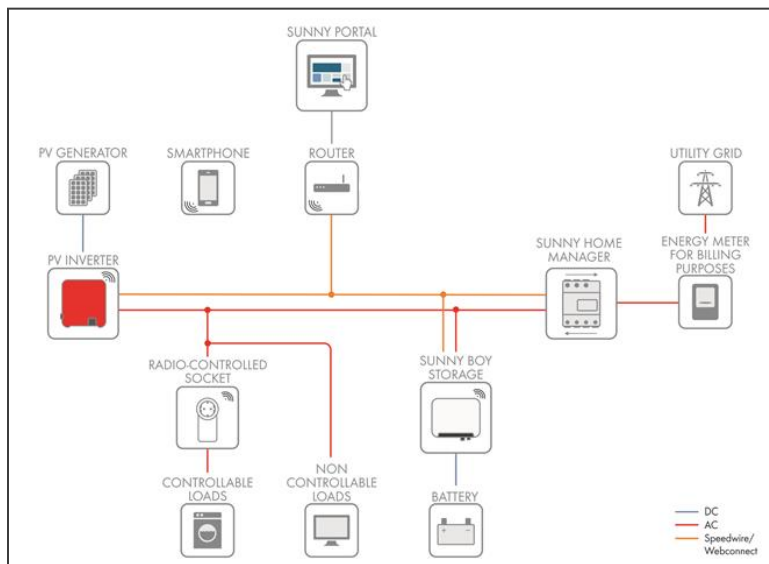


# WHY SMART INVERTERS?

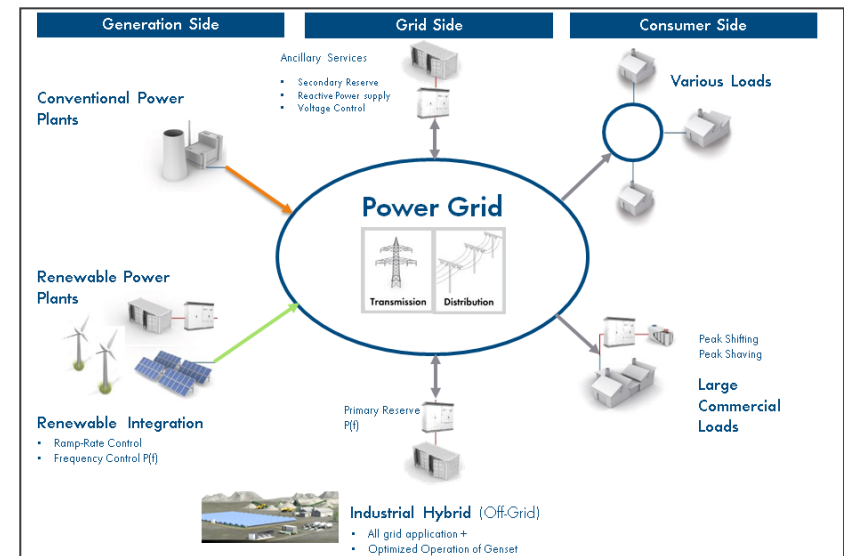


- Initially solar inverters were “just” devices to convert DC power to AC power for interconnecting solar system to the utility grid and injecting as much power as possible.
- Nowadays, more renewable energy integration in the grid and the modernization of solar applications means that solar PV solutions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

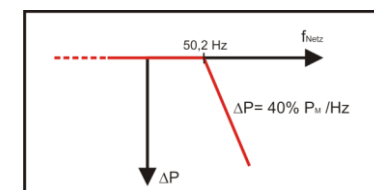
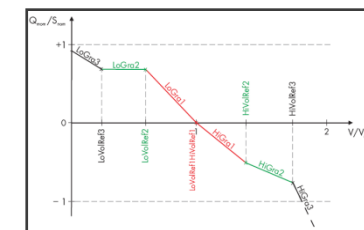
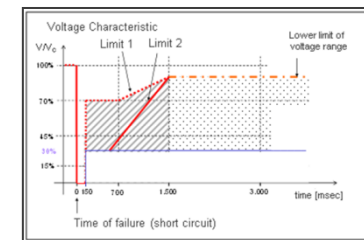


- **SMA has been working for years in different Smart Inverter working groups:**
  - FIGII (Forum on Inverter Grid Integration Issues)
  - California Rule21
  - SIWG (Smart Inverter working group)
  - HECO Rule 14 working group
  - IEEE 2030.5 (SEP2.0/IEEE 61850/SunSpec)
  - **APS Solar Partner Program** 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



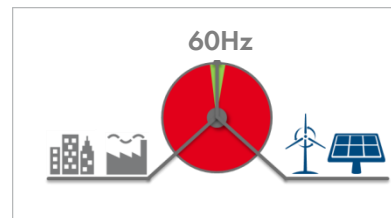
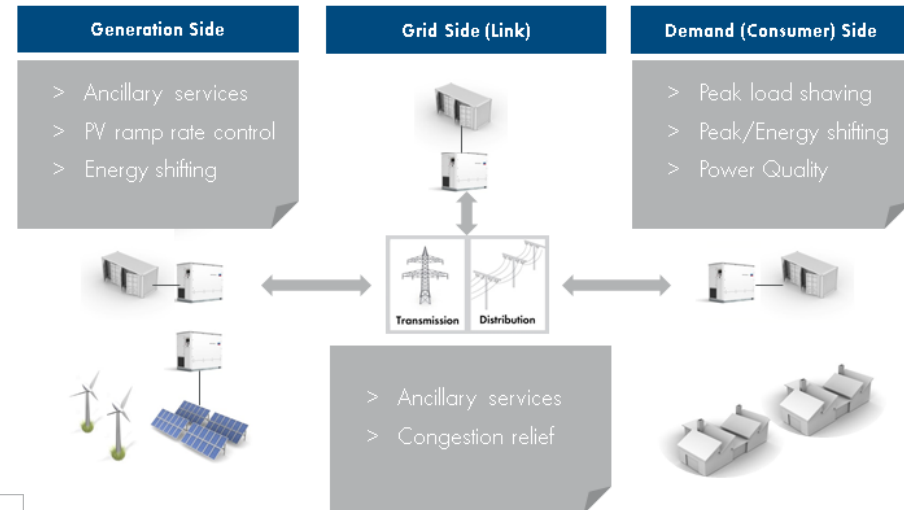
- The objective is to implement the ACTION PLAN for the DER integration in different phases. Phase 1 to be deployed on Sept 7<sup>th</sup>.
- Main Grid Management functions requested by **RULE21** for the inverters are:
  - Anti-islanding - activated
  - Low/High Voltage Ride Through - activated
  - 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

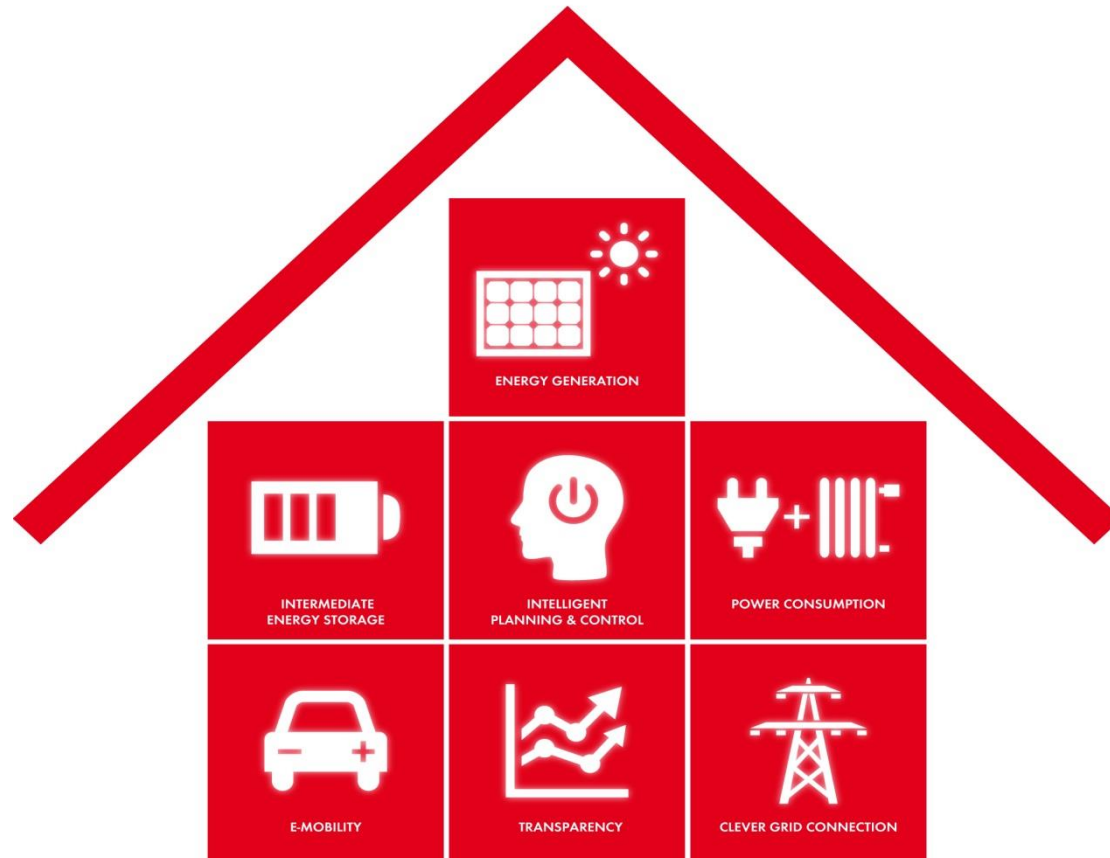


# FUTURE STEPS



- 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?