

# Distributed PV Monitoring

An EPRI Research Project

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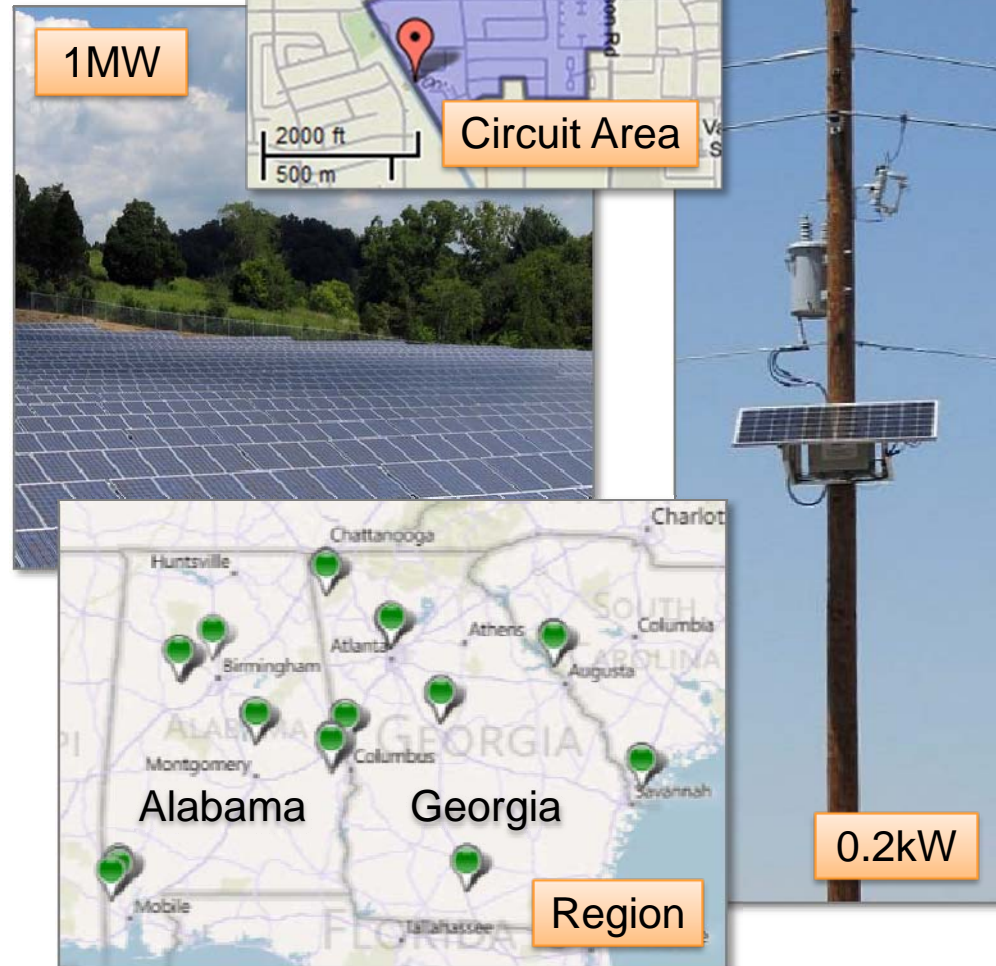
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## Field monitoring to characterize PV system performance & variability

- **Utility interactive PV systems**
  - ✓ Single modules on poles
  - ✓ 1MW plants
  - ✓ 200+ sites committed nationwide
- **Field measurements for 1+ years**
  - ✓ AC power meter
  - ✓ Plane-of-array pyranometer
  - ✓ Module surface temperature
  - ✓ ...More sensors on select sites
- **Data acquisition**
  - ✓ 1-second resolution
  - ✓ Time synchronized
  - ✓ Automated uploads to EPRI
  - ✓ Structured data storage at EPRI



# Simulation Platform -- OpenDSS

- Open source of EPRI's Distribution System Simulator

- developed in 1997
- open sourced in 2008 to collaborate with other research projects

- OpenDSS designed from the beginning to capture

- Time-specific benefits **and**
- Location-specific benefits

- Differentiating features

- full multiphase model
- numerous solution modes
- dynamic power flow
- system controls
- flexible load models

- Needed for analysis of

- DG/renewables
- energy efficiency
- PHEV/EV
- non-typical loadshapes

