Power 2020

A plan to best meet GRU's obligation to the reliability of the bulk electric system (BES) of The State of Florida and best serve the needs of GRU's customers.

Item #130957
Regional Utilities Committee
September 11, 2014

GRU
More than Energy

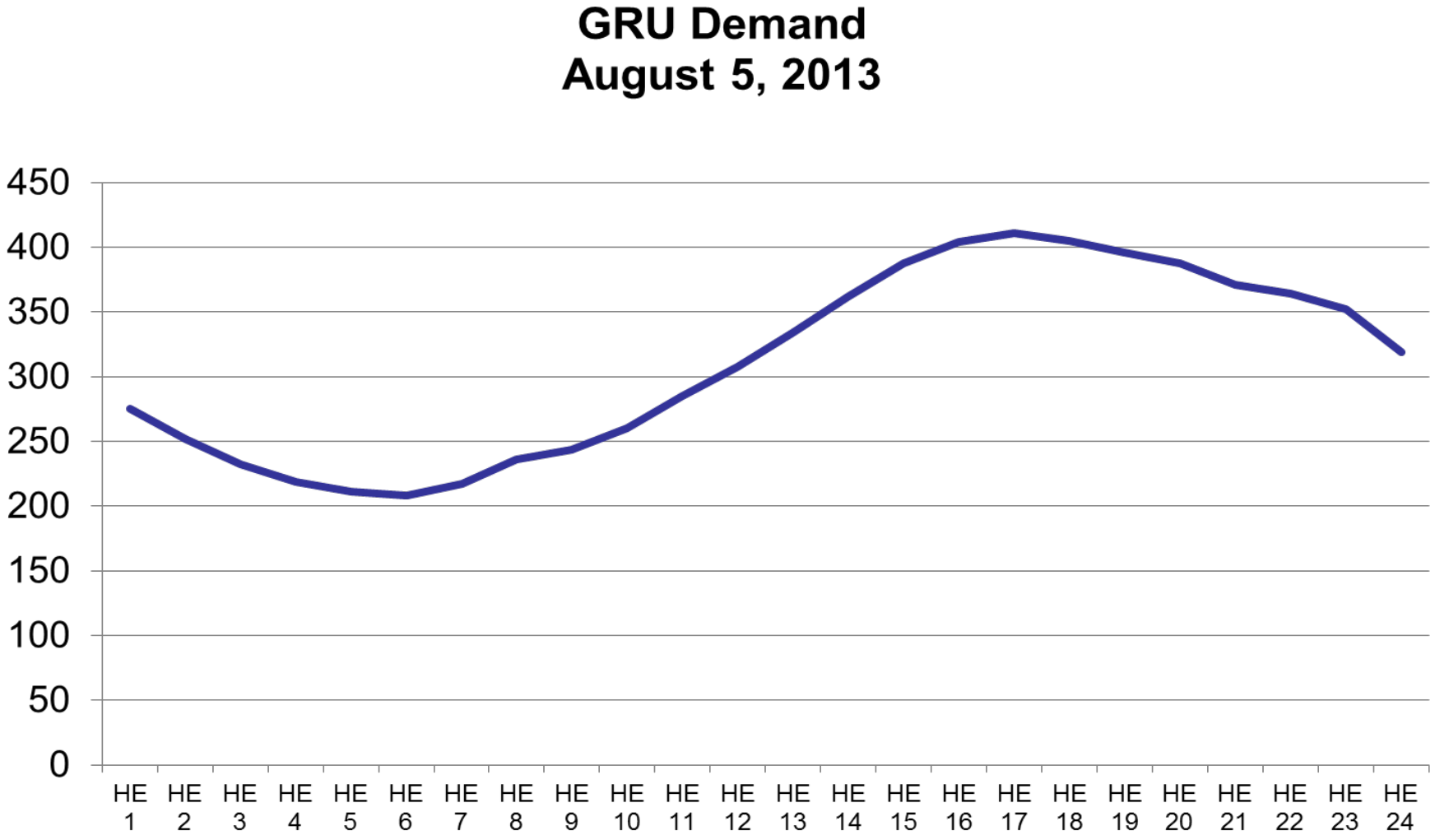
Power 2020 will Consider:

- Seasonal, daily and hourly customer demand
- Future regulatory (EPA, NERC) constraints
- GRU generation assets
- The GRU transmission & distribution systems
- Current purchase power obligations (GREC)
- Future purchase power opportunities
- Distributed Energy Resources (DER)
- Demand side load management
- Asset aggregation

What is significant about 2020?

- Not so far out on the planning horizon that dealing with ramifications can be delayed
- Far enough out on the planning horizon that there is time for action
- GRU's current coal transportation contract runs out on December 31, 2019 and the "as delivered" cost of coal will likely increase
- EPA Existing Source Performance Standard (ESPS)/CO_2 Building Blocks #1 & #2 Compliance Year

Current & Evolving Situation Demand Characteristics



Current & Evolving Situation Generation

(in GRU Service Territory; GRU + GREC + DER)

- GRU is currently long in base load generation beyond the planning horizon
- DH 2 required to perform intermediate service
  - Deep load cycling
  - Seasonal cold standby (CSB)
    - Gas –vs- coal price dependent
- EPA ESPS/ CO_2 Emissions from Power Plants
  - Potential Off/On Cycling of Deerhaven 2
- Increasing intermittent distributed generation (solar)

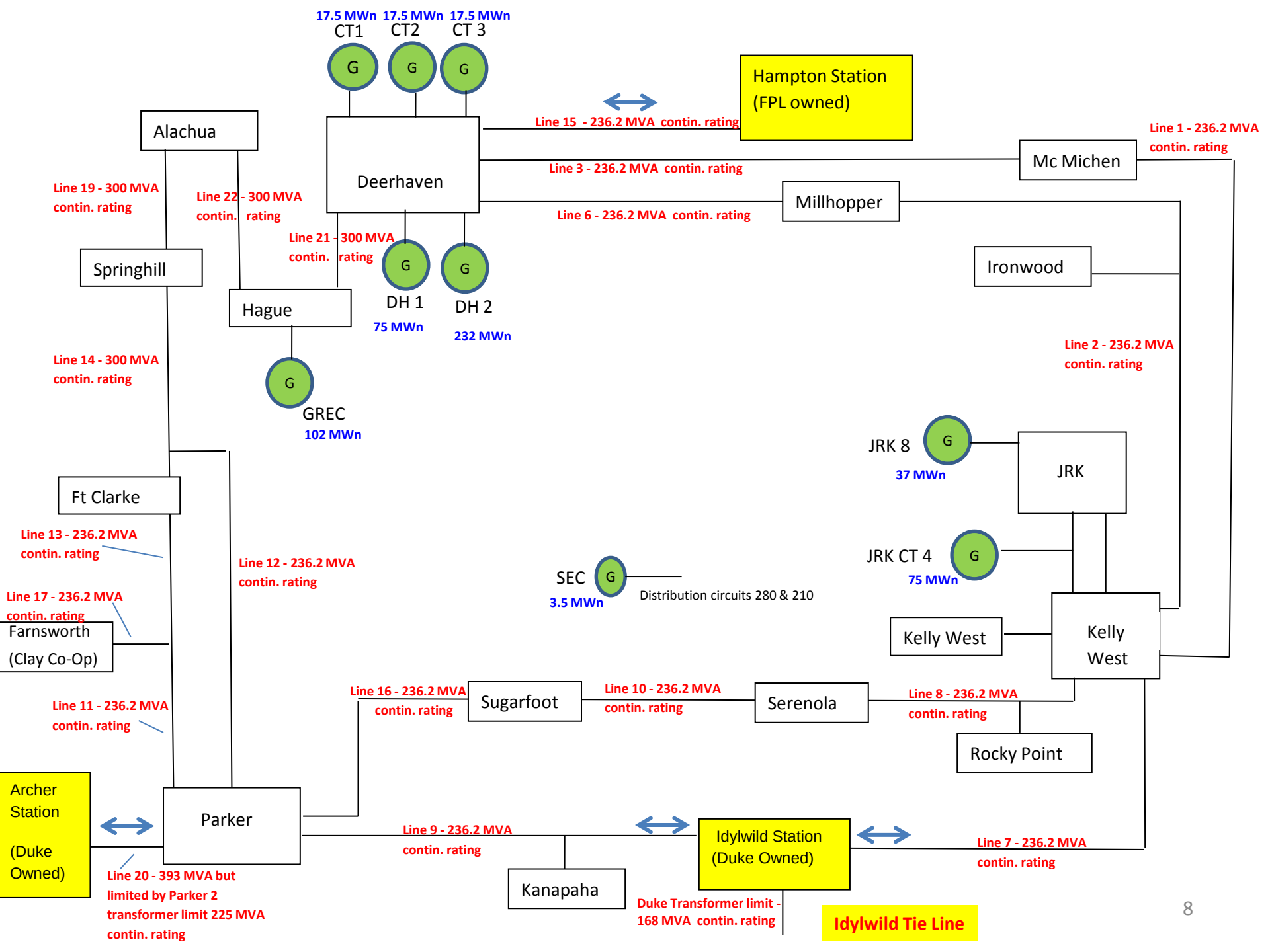
Current & Evolving Situation Generation

Plant / Unit	Primary Fuel		Net Summer Capability (MW)
GREC	Waste Wood		102.5
J R Kelly Combine Cycle 1	Natural Gas		112.0
Deerhaven Generating Station ST 2	Coal		232.0
		Base Capacity	**446.5**
Deerhaven Generating Station ST 1	Natural Gas		75.0
		Intermediate Capacity	
Deerhaven Generating Station CT 3	Natural Gas		75.0
			150.0
Deerhaven Generating Station CT 1	Natural Gas		17.5
Deerhaven Generating Station CT 2	Natural Gas		17.5
		Peaking Capacity	**35.0**
South Energy Center	Natural Gas		4.1
		Total Capacity	**635.6**

Note: All time Peak Load was 484 mw, served in 2007

Current & Evolving Situation Transmission

- Three GRU ties with Duke, one with FPL
- Option to serve load with imported power
  - Existing ties will not reliably support serving load solely by imported power
    - Above 375 MW load, loss of one tie would overload GRU and FPL or Duke
    - Currently must have generation in GRU service territory


17.5 MWn
CT1
17.5 MWn
CT2
17.5 MWn
CT 3
G
G
G
Hampton Station
(FPL owned)
Line 15 - 236.2 MVA contin. rating
Alachua
Deerhaven
Line 1 - 236.2 MVA
contin. rating
Mc Michen
Line 3 - 236.2 MVA contin. rating
Line 19 - 300 MVA
contin. rating
Line 22 - 300 MVA
contin. rating
Millhopper
Line 6 - 236.2 MVA contin. rating
Line 21 - 300 MVA
contin. rating
Springhill
Ironwood
G
G
DH 1
75 MWn
DH 2
232 MWn
Hague
Line 2 - 236.2 MVA
contin. rating
Line 14 - 300 MVA
contin. rating
G
GREC
102 MWn
JRK 8
G
37 MWn
JRK
Ft Clarke
Line 13 - 236.2 MVA
contin. rating
Line 12 - 236.2 MVA
contin. rating
JRK CT 4
G
75 MWn
SEC
G
3.5 MWn
Distribution circuits 280 & 210
Line 17 - 236.2 MVA
contin. rating
Farnsworth
(Clay Co-Op)
Kelly West
Kelly
West
Line 16 - 236.2 MVA
contin. rating
Sugarfoot
Line 10 - 236.2 MVA
contin. rating
Serenola
Line 8 - 236.2 MVA
contin. rating
Line 11 - 236.2 MVA
contin. rating
Rocky Point
Archer
Station
(Duke
Owned)
Parker
Line 9 - 236.2 MVA
contin. rating
Idylwild Station
(Duke Owned)
Line 7 - 236.2 MVA
contin. rating
Line 20 - 393 MVA but
limited by Parker 2
transformer limit 225 MVA
contin. rating
Kanapaha
Duke Transformer limit -
168 MVA contin. rating
Idylwild Tie Line

Current & Evolving Situation
Distributed Generation

- Solar generation in GRU's service territory will continue to increase
  - Intermittency requires quicker system generation response to follow load
- Expectation that other forms of DER will enter the mix
  - Fuel cells? …Wind?
- Potential for mutually beneficial operation of standby generation

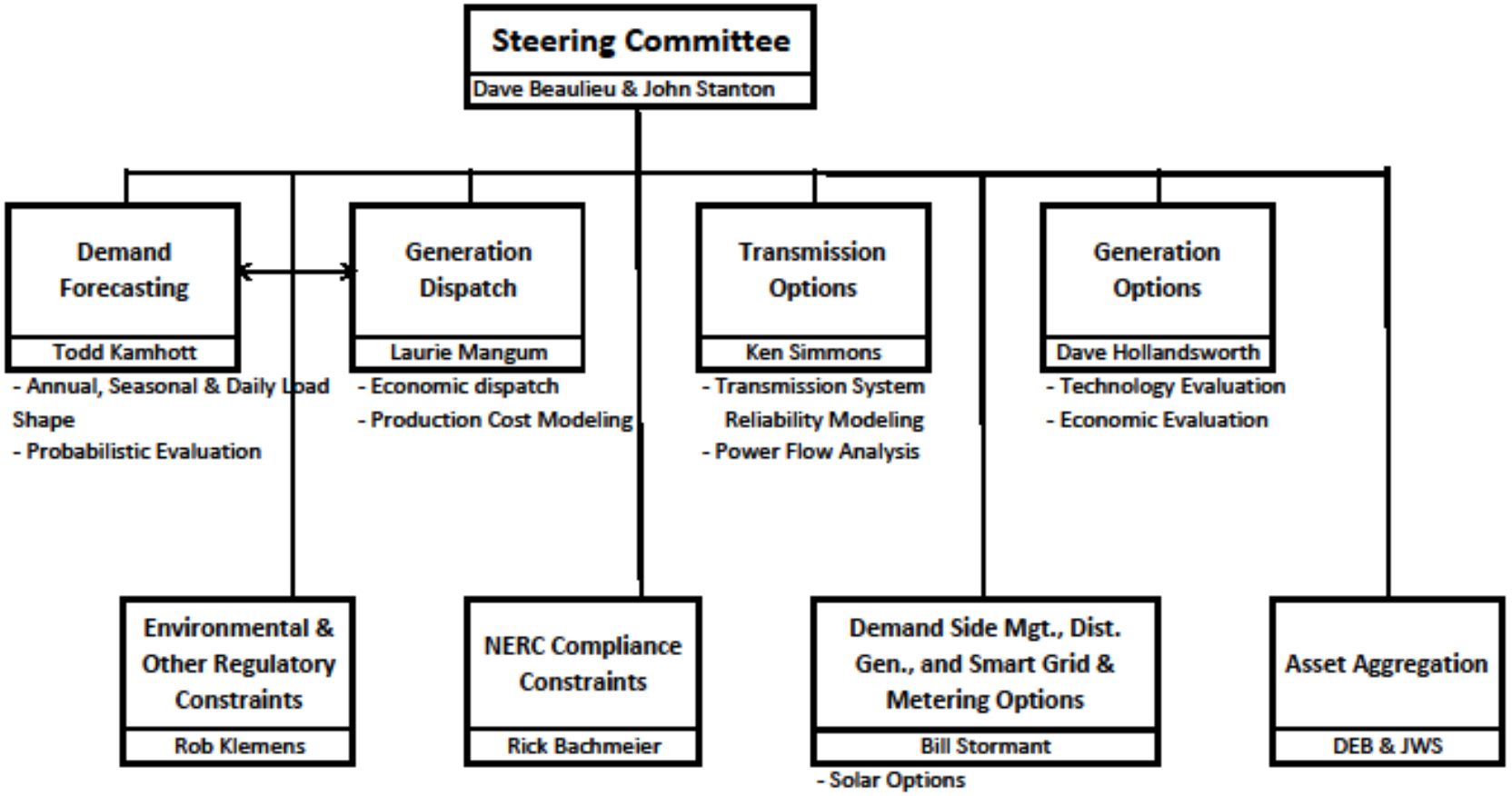
Current & Evolving Situation Demand Side Management

- DSM is a net negative air emissions alternative to generation
  - It can be a low cost alternative in meeting reserve calls
  - It can reduce peak load generating requirements
- GRU has no active DSM
  - DSM is a “Building Block” in the ESPS/CO_2

Current Activities/Next Steps

- Formalizing Team Members and Organization Design
- Developing overall scope & schedule of Power 2020 (est. draft report by 9-30-15)
  - Incorporate ESPS/CO_2
- Identifying internal resources
- Determining Task Assignment for consultant(s)
- Received DEP Construction Permit for 50 MW of peaking power in 2018-19
  - Place holder to establish air emissions cap
- Simulation of alternative scenarios

POWER 2020


Steering Committee
Dave Beaulieu & John Stanton
Demand Forecasting
Todd Kamhott
- Annual, Seasonal & Daily Load Shape
- Probabilistic Evaluation
Generation Dispatch
Laurie Mangum
- Economic dispatch
- Production Cost Modeling
Transmission Options
Ken Simmons
- Transmission System Reliability Modeling
- Power Flow Analysis
Generation Options
Dave Hollandsworth
- Technology Evaluation
- Economic Evaluation
Environmental & Other Regulatory Constraints
Rob Klemens
NERC Compliance Constraints
Rick Bachmeier
Demand Side Mgt., Dist. Gen., and Smart Grid & Metering Options
Bill Stormant
- Solar Options
Asset Aggregation
DEB & JWS