



QUANTA  
TECHNOLOGY

A QUANTA SERVICES COMPANY

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# City of Lake Worth Beach Demand Response





## Terminology & Quanta View of DR

- Quanta Technology welcomes the opportunity to clarify and answer questions regarding the proposed Demand Response Consulting Services
- Demand Response programs are designed to reduce or shift customer loads at desired times. Further information can be found:
  - “Demand Response Consulting Support Proposal” by Jesus Gonzalez, Diana Prkacin
  - “About Demand Response” by Veronika Rabl



## Question:



Could you please share documentation of any Demand Response programs that Quanta has previously implemented? (Please include details, e.g., size of D-R program relative to mean and peak load; number of years program in place; incentives offered; cost savings to utility, cost savings to customers; utility type (MOU, IOU), etc.)



## Demand Response Programs

- Quanta Technology's experience with DR Programs revolves around:
  - Design and technology evaluation
  - Pilot projects
  - AMI based DR implementation
- Quanta also has extensive experience with Virtual Power Plants and DERMS which incorporate demand response. Examples include:
  - DERMS for Community Solar PV Aggregation and Control
  - DERMS as Aggregator of Aggregators
  - Customer Microgrid Support
  - Charge Management System
- Several of our consultants have extensive DR experience. Some examples include:
  - Veronika Rabl, Executive Advisor: Over 30 years of Demand Response and Energy Efficiency experience (technology development and testing, program design, benchmarking, support for utility implementation)
  - Phillip Vallejo, Principal Advisor: Worked on Demand Response programs for Florida Power & Light for over 8 years. Programs were oriented around load shaving via device control.
  - Lou Santilli, Principal Advisor: Worked with Progress Energy / Duke Energy for 20+ years with 5 years direct Demand Response experience utilizing pager-controlled DR switching on A/C, pool pumps, and water heaters as well as commercial/industrial dispatchable energy programs



## Question:



Could you please share documentation on any virtual-net metering, community solar, and/or virtual power plant programs that Quanta has implemented?

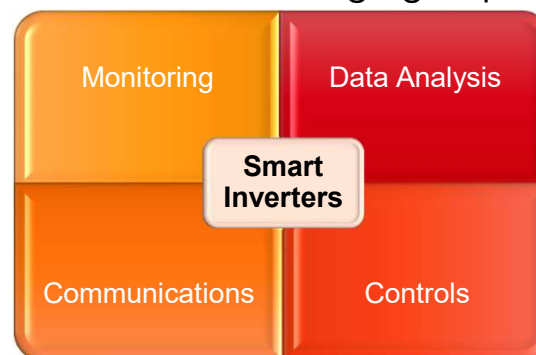
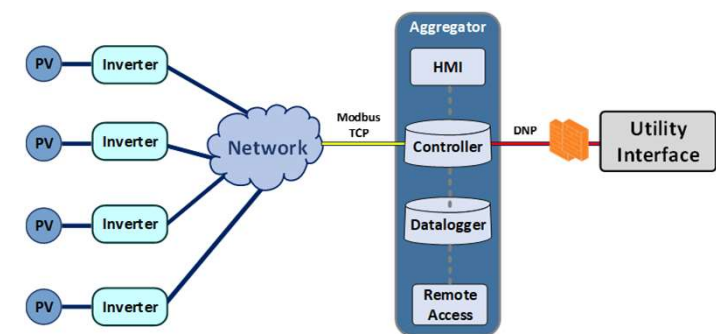


## DERMS for Community Solar PV Aggregation and Control (ComEd)



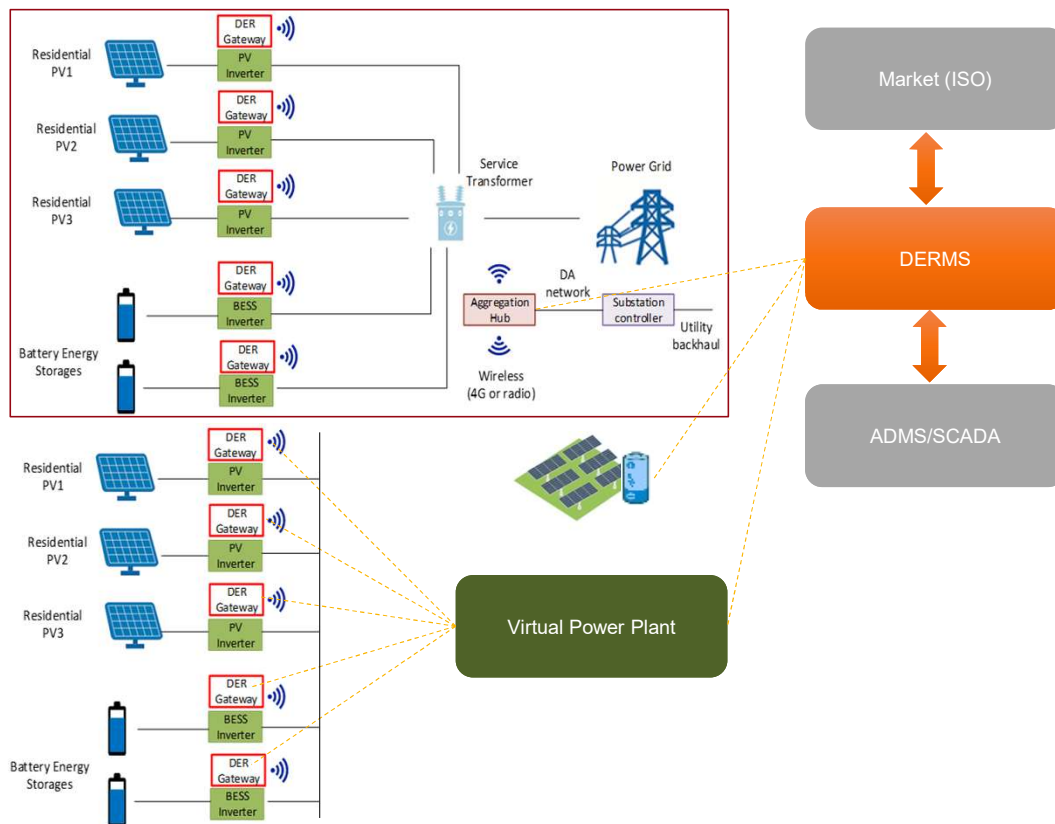
Working a pilot project with ComEd to develop a control platform for Chicago Housing Community

- Aggregating (grouping) 17 distributed roof-top PV systems on 16 buildings
- Providing single point of controls for the Utility dispatcher
  - Smart inverter autonomous functions: Volt-VAR, Volt-Watt, Ramp rate
- Data collection and transfer, for large groups of PV inverters





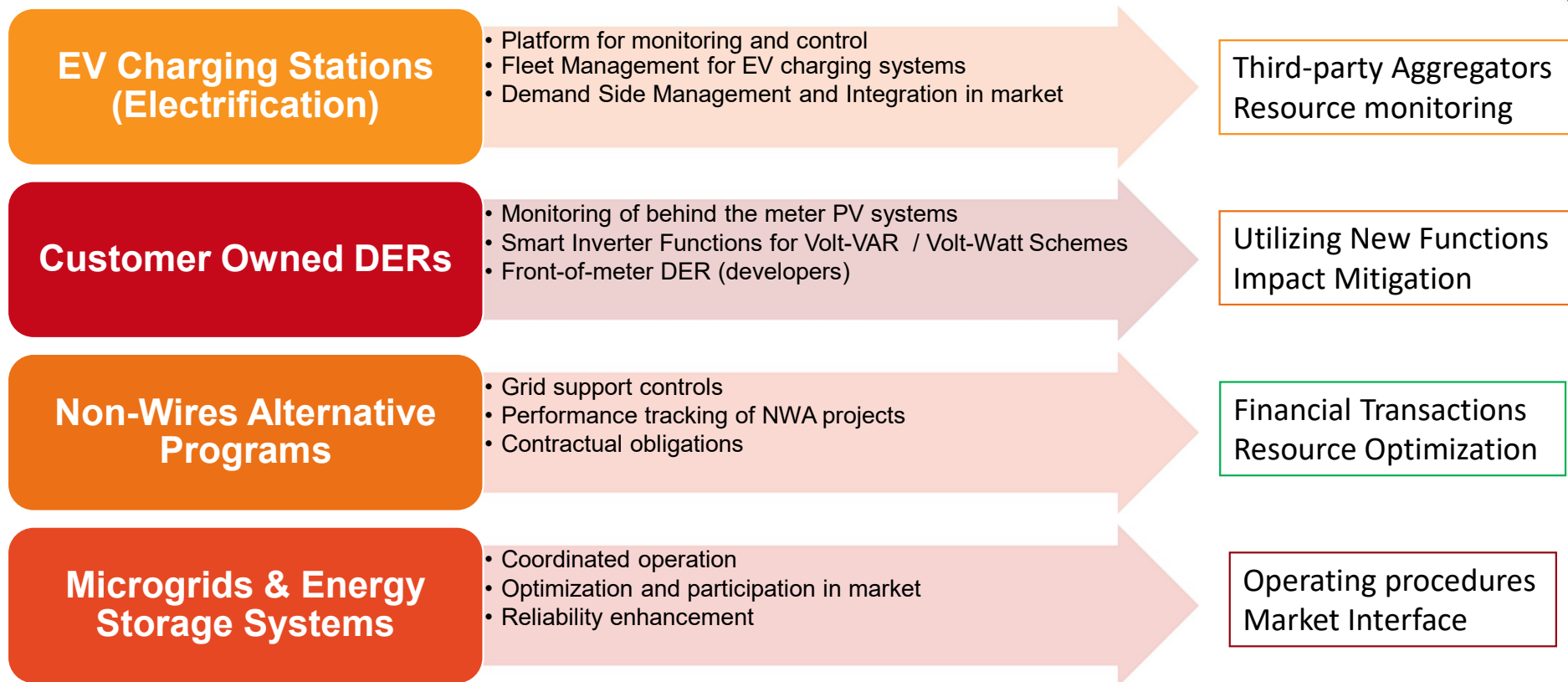
## DER Management: DERMS and VPP



- DERMS is an application platform designed to manage device information, monitor and enable optimization and control of DER and DR.
- DERMS should aggregate, simplify, optimize and enable DER and DR functionality.
- VPP is a local DERMS (subset) which mainly focuses on managing behind-the-meter assets for grid-connected and market functions
- Transactive Energy and Community Energy systems



## DERMS Applications

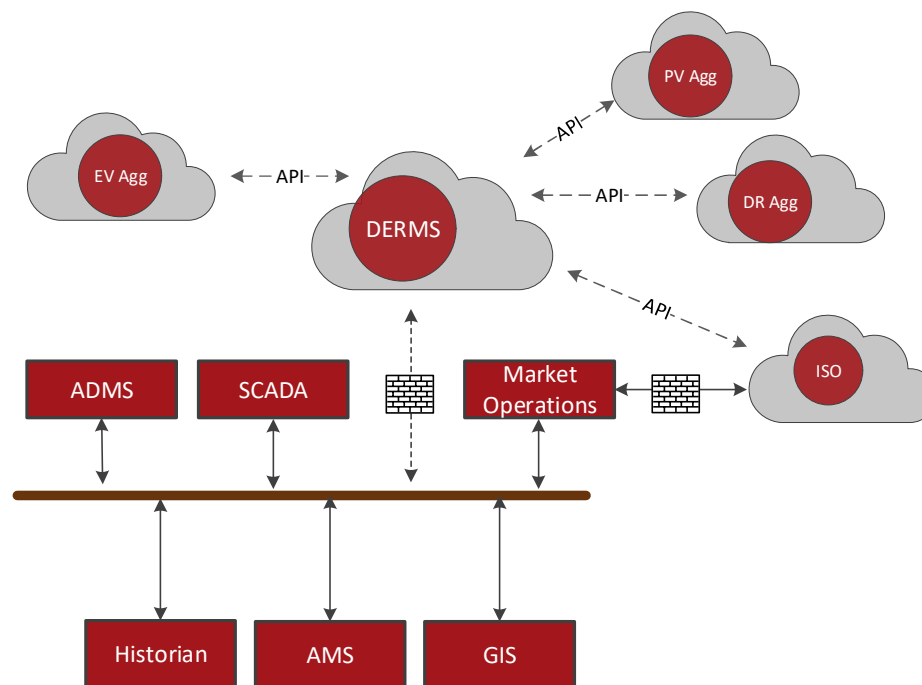






## DERMS as Aggregator of Aggregators (Entergy)

- **Overview:** Pilot project encompassing Cloud-hosted company-wide DERMS platform for managing multiple existing grid-edge programs and resources (DER, DR, DSM)
  - DER: Rooftop PV, EV
  - DR programs for C&I customers
  - Smart thermostats and DSM
- DERMS architecture, specification and procurement support
- Integration support:
  - Market participation (MISO)
  - Integration to ADMS
  - Historian





# Customer Microgrid Support Pilot Project (Public Service Company of New Mexico)

## Planning

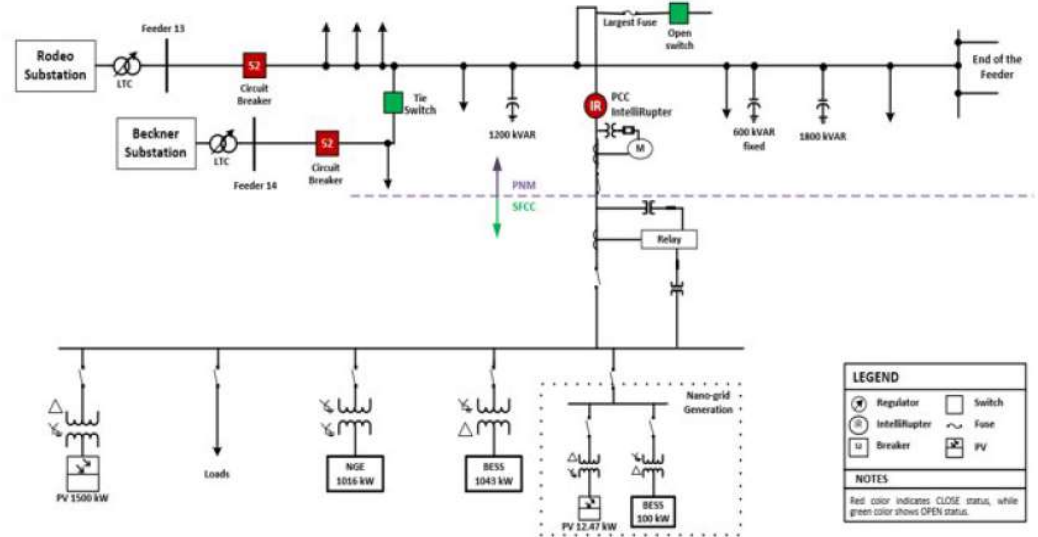
- Voltage analysis
- Reactive power studies
- Flicker study
- Thermal analysis

## Protection Studies

- Overcurrent protection design and coordination
- Protection at the Microgrid Point of Interconnection (POI)
- DER protection including anti-islanding

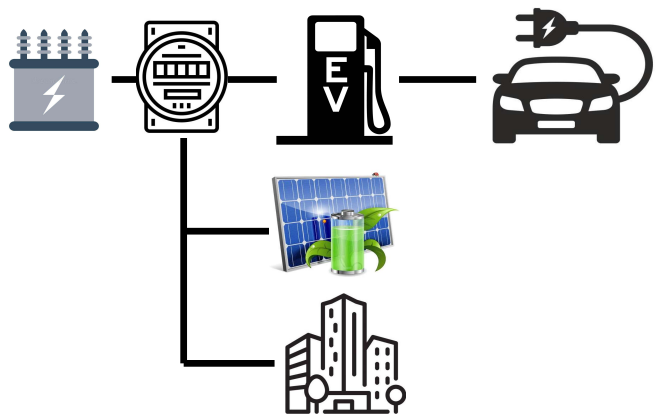
## Testing

- Supporting PNM with requirements and procedure for the microgrid testing





## Charge Management System (Southern California Edison Metrolink)

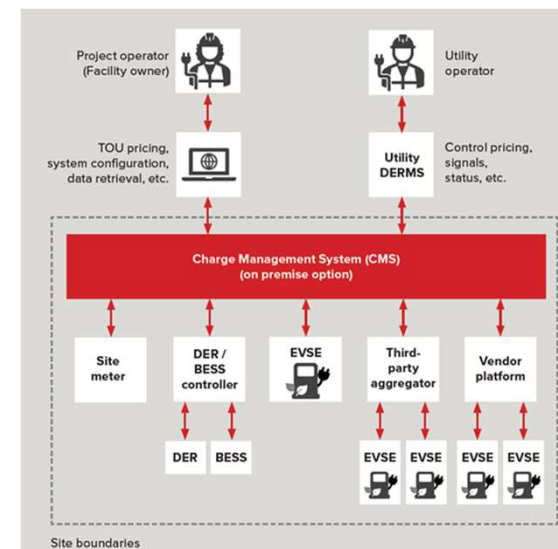


**Unlock more Charging Capabilities with less System Upgrades!**

**One interface for facility operator**, for managing EVSEs, DERs/BESS, controllable loads, etc.

**Vendor agnostic!** Capable of integrating platforms from different vendors!

- Pilot Project encompassing a CMS for managing over 50 chargers
- CMS monitors the loading of the service transformers, performs dynamic demand response, and dispatches DER/BESS, to:
  - perform grid support,
  - minimize the facility operating costs, and/or
  - provide charge resiliency.
- Capable of integration of different resources including site meters, BESS/DER/EVs/third party aggregators, etc.
- Flexible design





## Question:



Could you please describe Quanta's experience with any prosumer programs or rate structures that encourage community-side assets?



## Prosumer Programs / Rate Structures

- Quanta Technology is not involved in regulatory proceedings such as rate design
- Quanta treats all customer-oriented programs as prosumer programs



# Question:



Would the D-R program proposed by Quanta explicitly encourage people to invest in behind-the-meter energy storage systems? If so, how?



## Behind the Meter Storage Systems

- Specific program recommendations would be made at the conclusion of the study
- In general, if benefits are found from load shifting, behind-the-meter energy storage options may be pertinent. For example:
  - Batteries
  - Thermal storage
  - Storage water heating



# Question:



In what ways could a D-R program designed by Quanta reduce our utility's near and long term purchased power costs?





## Purchase Power Cost Reduction

- Quanta Technology as part of the DR project's data collection task, will review LWB PPA agreement(s) and system load profile to determine potential savings
- Generally speaking:
  - Reduction in system peak demand lowers costs incurred via typical demand charges
  - Load shifting can take advantage of time-differentiated rates



# Question:



What connection does Quanta see between your design for a D-R program and international efforts to reduce burning of fossil fuels?



## DR & Fossil Fuel Reduction

- One of the most effective decarbonization approaches is to shift the load from fossil to renewable generation
  - DR programs could be designed to shift loads like EV charging or water heating from evening hours to mid-day solar or night-time wind
- Program design for decarbonization is not included in the proposed scope of work
- Quanta Technology partners with utilities to develop IRP and helps set realistic expectations for transitioning to renewables



## Question:



In Quanta's opinion, as international pressure increases for drastically reducing fossil fuel emissions, would it be prudent to expect changes in the pricing and/or taxing structures for purchasing of wholesale electricity? (Examples might include time of use wholesale pricing, or changes to amount-based pricing, or changes in taxation.) If so, how would Quanta design a D-R program to anticipate, and take advantage of, these expected changes?



## Wholesale Pricing Impacts

- Quanta believes it would be prudent to expect changes in the pricing/taxing structure for electricity, including wholesale purchases, as pressure to reduce fossil fuel emissions accelerates
- DR Programs can be designed with a capability to adapt to changes once these have been identified



# Question:



What imminent advances in technology and in energy pricing does Quanta anticipate over the next 5-10 years?



## Imminent Technology Advancements

- Quanta Technology anticipates technology advances in all aspects of grid operations, customer interfaces, and technologies throughout the grid.
  - AMI 1.0 transitioning to Advanced Grid Infrastructure (AGI) supporting DA, Distributed Generation, Electrification, DR, Street Lighting/Smart City
- We anticipate rapid advancements in communications technology that will facilitate more flexible pricing and dispatch
- Numerous resources are included in the Quanta Technology Website: [www.quanta-technology.com](http://www.quanta-technology.com) under Virtual Library→Articles & White Papers. Some examples include:
  - Grid Modernization for Public Power and Cooperatives
  - Smart Meters and Grid Modernization: A Guide to a Successful AMI Implementation
  - Workforce Transformation: Powering the Utility of the Future
  - Predictive-Maintenance Practices: For Operational Safety of Battery Energy Storage Systems
  - Microgrid Protection: An Overview of Protection Strategies in North American Microgrid Projects
  - Operational Frameworks for Utility Integrated Microgrids
  - Microgrids are for Real
  - Design for Distributed Energy Resources



**Question:**



How would these advances/changes factor into Quanta design of a D-R program design?





## Imminent Technology Advancements & DR Programs

- A demand response technology assessment is included in the project
- Our DR program design will reflect the best of available technologies and approaches



# Question:



Would it be wise to implement D-R simultaneously with a Time of Use rate structure? Please address pros and cons of a simultaneous design.



## DR & Time of Use Considerations

- Decisions on rates/incentives must be done as part of the DR program design
  - TOU is not required to have a DR program
  - TOU can be an effective tool to encourage desired DR measures
- We are not aware of any cons with simultaneous implementation



# Question:



How would bi-directional charging of electric vehicles be incorporated into Quanta's D-R program?



## Bi-Directional EV Charging

- Bi-directional charging of electric vehicles is not commercially available for implementation
- It would be premature to include as part of our recommendation



## Question:



Finally, if the City of Lake Worth were to set up its D-R with a performance reward, that is, where the implementor of the program received a benefit for each incremental increase in participation (i.e., “NegaWatts” produced), how would Quanta design that program?



## DR Performance Reward Programs

- Performance based rewards may be an outcome as we develop a better understanding of incremental benefits and impacts during the study period



## Why Choose Quanta Technology?

### FULLY INDEPENDENT

Vendor agnostic  
Freely delivers the best-fit solution

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### EXCEPTIONAL INDUSTRY EXPERIENCE

Extensive depth and breadth

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### HOLISTIC APPROACH TO TECHNOLOGY ADOPTION

Focus on people, process,  
end-customers, and technology

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### CUSTOMER PARTNER MINDSET

Focus on customer needs,  
trust, and relationships  
Integrated team members

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### A TRUSTED ADVISOR

Leverage our experience to  
protect your project success

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**Thank You For Your Time  
Please Do Not Hesitate To Contact Us With Any Questions**



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