Joint Workshop of the CAISO and CPUC Energy Division

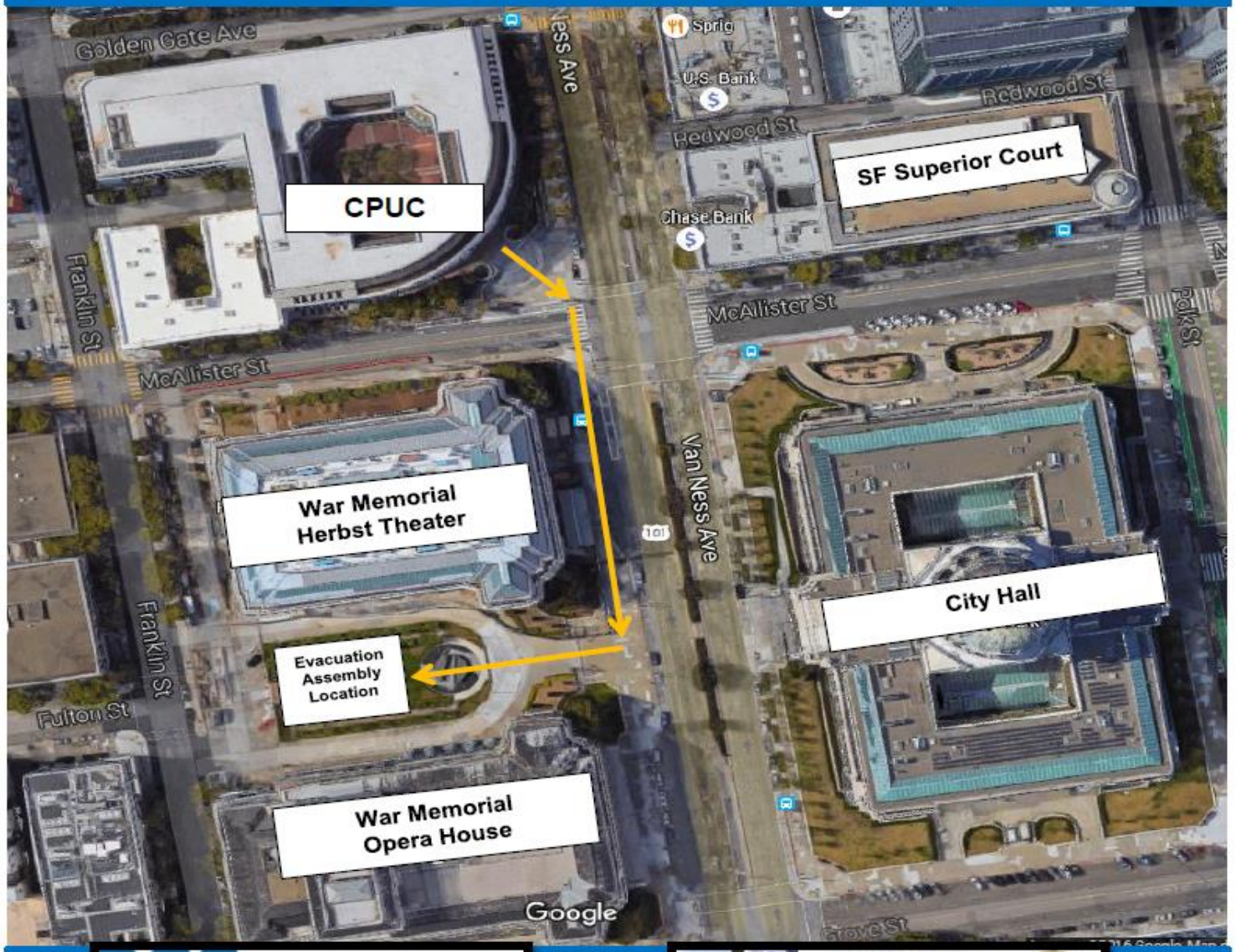
Proposed Framework for Multiple Use Applications for Electric Storage Resources

June 2, 2017 – 10 am to 4 pm

Safety and Emergency Information

- In the event of an emergency, please proceed calmly out the exits.
- The evacuation site is the Garden Plaza area between Herbst Theater and the War Memorial Opera House Buildings, on Van Ness
- Exit the building at the Main Entrance at Van Ness and McAllister streets, cross McAllister Street, pass Herbst Theater and enter the plaza.

Evacuation Assemblv Location



CALIFORNIA DEPARTMENT OF GENERAL SERVICES

California Public Utilities Commission

Remote Participation

Conference Call

1-866-803-4003
passcode: 9869619

WebEx

https://van.webex.com/van/j.php?MTID=m048373dce5db955f9f871e429136d35f

number: 743 165 412
password: !Energy1

Agenda

10 – 10:30 am	Introduction	Rachel M, CPUC
10:30 am – noon	Multiple Use Application Framework	Rachel M, CPUC Lorenzo K, CAISO
Noon – 1:00 pm	LUNCH	
1:00 – 2:30 pm	Measurement & Metering for MUA and Station Power	Alex M, CESA Stephen S, CESA Cody H, LS Power Robert T, SCE Bill W, CAISO Rachel M, CPUC
2:30 – 3:30 pm	Remaining Issues	Rachel M, CPUC Lorenzo K, CAISO
3:30 – 4:00 pm	Next Steps	Rachel M, CPUC Lorenzo K, CAISO

INTRODUCTION

Workshop objectives.

Workshop Objectives

• Socialize and discuss *Joint Workshop Report and Framework – Multiple-Use Applications for Energy Storage*, issued May 17, 2017.

• Build record for remaining two station power issues deferred in Decision (D.) 17-04-039.

• Identify issues for comments not included in questions in Framework.

• For comments: prioritize issues to be addressed; and, anything that comes up at workshop that is not in questions or discussion in paper.

MULTIPLE USE APPLICATIONS

Framework elements:

Domains

Services

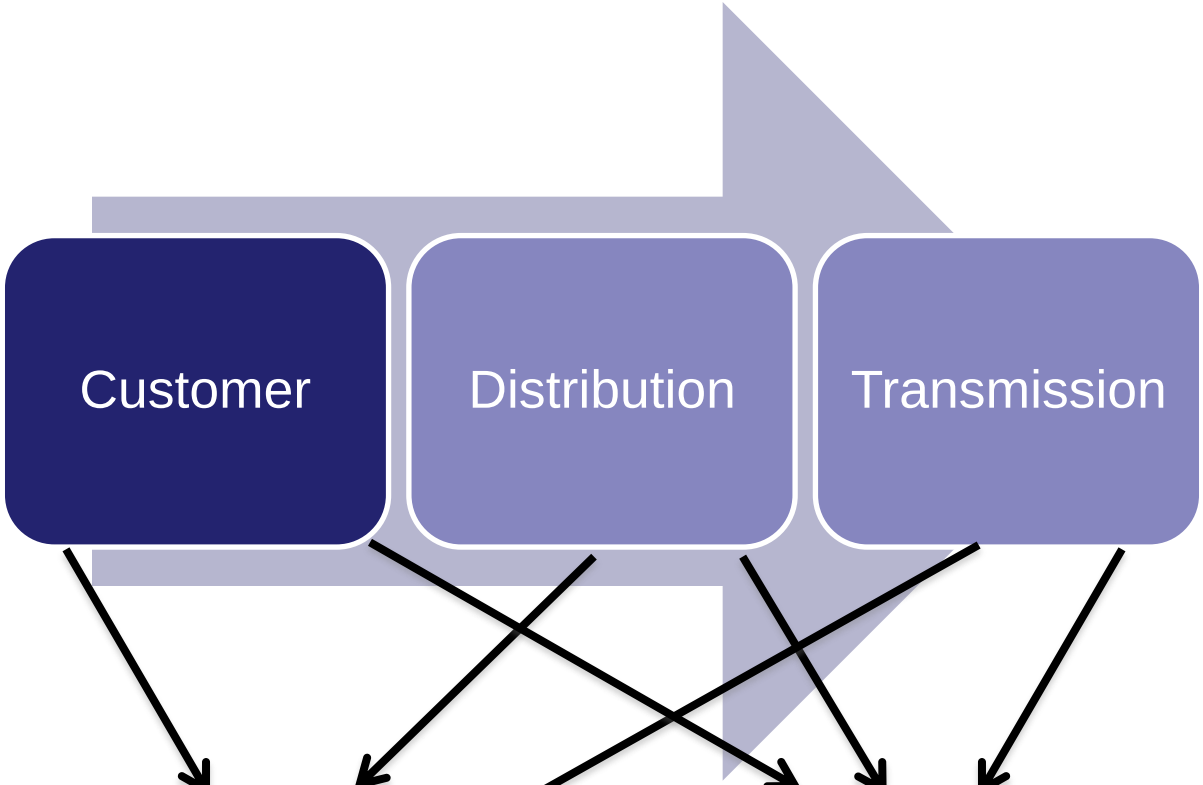
Reliability services

Resource adequacy services

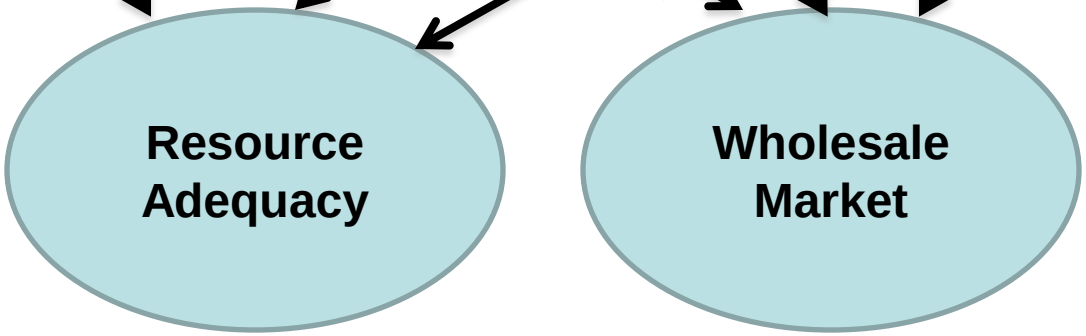
Combinations of services, by domain, with same capacity

Domains

Grid Domains (point of interconnection)



Service Domains



Proposed Rules for Provision of Services in Domains

1) Resources interconnected in the customer domain may provide services in any domain.

2) Resources interconnected in the distribution domain may provide services in all domains *except* the customer domain.

3) Resources interconnected in the transmission domain may provide services in all domains *except* the customer or distribution domains.

4) Resources interconnected in any grid domain may provide resource adequacy, transmission and wholesale market services.

Domain	All Services
Customer (BTM)	• TOU bill management • Demand charge management • Increased PV self-consumption • Back-up power
Distribution (IFOM)	• Distribution capacity deferral • Reliability (back-tie) services • Voltage support • Resiliency/microgrid/islanding
Transmission	• Transmission deferral • Black start • Voltage support • Inertia • Primary frequency response
Wholesale Market	• Frequency regulation • Imbalance energy • Spinning reserves • Non-spinning reserves
Resource Adequacy	• System capacity • Local capacity • Flexible capacity

Domain	Reliability Services
Customer (BTM)	
Distribution (IFOM)	• Distribution capacity deferral • Reliability (back-tie) services
Transmission	• Transmission deferral • Black start • Voltage support • Inertia • Primary frequency response
Wholesale Market	• Frequency regulation • Spinning reserves • Non-spinning reserves
Resource Adequacy	• Local capacity • Flexible capacity

Domain	Non-Reliability Services
Customer (BTM)	• TOU bill management • Demand charge management • Increased PV self-consumption • Back-up power
Distribution (IFOM)	• Voltage support • Resiliency/microgrid/islanding
Transmission	
Wholesale Market	•Imbalance energy
Resource Adequacy	• System capacity

Domain	All Services
Customer (BTM)	• TOU bill management • Demand charge management • Increased PV self-consumption • Back-up power
Distribution (IFOM)	• Distribution capacity deferral • Reliability (back-tie) services • Voltage support • Resiliency/microgrid/islanding
Transmission	• Transmission deferral • Black start • Voltage support • Inertia • Primary frequency response
Wholesale Market	• Frequency regulation • Imbalance energy • Spinning reserves • Non-spinning reserves
Resource Adequacy	• System capacity • Local capacity • Flexible capacity

Proposed Rules for MUAs with Reliability Services

7)A storage device providing a reliability service may not perform any activities that would prevent its performance of the reliability service when needed.

8)If one of the services provided by a storage device is a reliability service, then that service must have priority.

9)Priority means that a single storage device may not contract for two or more different reliability services from the same capacity in a single, or multiple, domains.

	Customer			
	TOU bill management	Demand charge management	Increased PV self-consumption	Back-up power
Customer				
TOU bill management		Yes		
Demand charge management	Yes		Yes	
Increased PV self-consumption	Yes			Yes
Back-up power	Yes			
Distribution				
Distribution capacity deferral – RS	Distribution level reliability services must have priority.			
Reliability (back-tie) services – RS				
Voltage support	Yes			
Resiliency/microgrid/islanding				
Transmission				
Transmission deferral – RS	Transmission level reliability services must have priority. BTM resources in the demand forecast are not visible to the ISO, but may offset the need for transmission by reducing load.			
Inertia – RS				
Primary frequency response – RS				
Black start – RS				
Voltage support – RS				
Wholesale Market				
Spinning & non-spinning reserves – RS	Wholesale reliability services must have priority.			
Frequency regulation – RS				
Imbalance energy	Yes			

	Distribution			
	Dist. capacity deferral - RS	Reliability (back-tie) services - RS	Voltage support	Resiliency/micro grid/islanding
Customer				
TOU bill management	Distribution level reliability services must have priority.		Yes	
Demand charge management				
Increased PV self-consumption				
Back-up power				
Distribution				
Distribution capacity deferral – RS			Distribution level reliability services must have priority.	
Reliability (back-tie) services – RS				
Voltage support	Distribution level reliability services must have priority.			Yes
Resiliency/microgrid/islanding			Yes	
Transmission			Transmission level reliability service must be prioritized.	
Transmission deferral – RS				
Inertia - RS				
Primary Frequency Response – RS				
Black Start – RS				
Voltage Support – RS				
Wholesale Market				
Spinning & non-spinning reserves – RS			Wholesale market reliability services must be prioritized.	
Frequency Regulation – RS				
Imbalance Energy	Yes			

	Transmission				
	Tx deferral - RS	Inertia - RS	Primary Frequency Response - RS	Black Start - RS	Voltage Support - RS
Customer					
TOU bill management	Transmission level reliability services must have priority.				
Demand charge management					
Increased PV self-consumption					
Back-up power					
Distribution					
Distribution capacity deferral – RS					
Reliability (back-tie) services – RS					
Voltage support	Transmission level reliability service must be prioritized.				
Resiliency/microgrid/islanding					
Transmission					
Transmission deferral – RS					
Inertia – RS					
Primary frequency response – RS					
Black start – RS					
Voltage support – RS					
Wholesale Market					
Spinning & non-spinning reserves – RS					
Frequency regulation – RS					
Imbalance energy	Transmission level reliability service must be prioritized.				

Proposed Rules Specific to Distribution and Transmission Services

5) Resources providing transmission deferral (i.e., implemented in lieu of a transmission infrastructure investment) may have specific performance or direct control requirements depending on the specific location and nature of the transmission facility being deferred.

6) Resources providing distribution deferral may have specific performance or direct control requirements. We do not adopt any such requirements here, but note that they may be created in the future if deemed necessary in either this, or a companion, Rulemaking such as IDER.

Proposed Rules Specific to Distribution and Transmission Services

10) If the reliability service is procured to avoid or defer a transmission or distribution asset upgrade, the resource must comply with availability and performance requirements specified in its contract with the relevant authority.

11) For reliability services in the transmission and distribution domains, the ISO and UDC, respectively, may require the resource to respond to a direct operating instruction or a control signal rather than a normal market dispatch. This could mean, under the ISO tariff for example, that failure to perform as directed could constitute a tariff violation. Such a tariff violation may be either in place of, or in addition to, a financial penalty for not providing the service.

12) If a resource is deferring a transmission upgrade it may be required to retain available unloaded capacity that cannot be used for any other service in any domain in order to be able to respond to a contingency event when needed. The precise requirements will typically depend on the location and the specific transmission upgrade being deferred.

Proposed Rules for MUAs with Resource Adequacy Services

13) A storage device providing resource adequacy capacity should not perform any activities that could prevent an actual dispatch of that capacity when needed.
14) If one of the services provided by a storage device is resource adequacy capacity, in any grid domain, then that service must have priority.
15) A single storage device may contract for both resource adequacy capacity and a reliability service using the same capacity. For example, if a storage resource is providing local resource adequacy capacity, it may meet its resource adequacy must offer obligation (MOO) by providing any service in the wholesale service domain using its resource adequacy capacity.

	Resource Adequacy		
	Local capacity - RS	Flexible capacity - RS	System capacity
Customer			
TOU bill management	Yes, resource adequacy service must be prioritized.		Yes
Demand charge management			
Increased PV self-consumption			
Back-up power			
Distribution			
Distribution capacity deferral – RS			Yes, reliability service must be prioritized.
Reliability (back-tie) services – RS			
Voltage support	Yes, resource adequacy service must be prioritized.		
Resiliency/microgrid/islanding			
Transmission			
Transmission deferral - RS			Yes, reliability service must be prioritized.
Inertia – RS			
Primary Frequency Response – RS			
Black Start – RS			
Voltage Support – RS			
Wholesale Market			
Spinning and non-spinning reserves – RS	RA capacity may fulfill its RA must-offer obligation by providing wholesale market services.		
Frequency Regulation – RS			
Imbalance Energy			

MEASUREMENT & METERING

Station power – issues deferred in D.17-04-039

Metering for all systems.

Station power for customer resources participating in wholesale market.

Deferred by D.17-04-039

Rule 4 (proposed): "For sub-metered behind-the-meter storage resources that are participating in the wholesale market and are subject to a must-offer obligation, the station power rules apply just as they would for resources located in front of the meter, meaning that charging energy and efficiency losses would be charged wholesale rates."

~and~

Metering for IFOM systems – proposed options:

1)Require direct metering to measure wholesale and retail purchases and use or sale, respectively, of station power.

2)Designate no specific metering configuration, and leave measurement of station power to the seller and buyer to sort out. Suggests that the Commission staff be designated to arbitrate any disputes.





Station Power Metering for Energy Storage

Presentation to :

Joint CPUC & CAISO Workshop
CPUC Auditorium, San Francisco
June 2, 2017

Brief Introduction – LS Power

A balanced point of view: active member of California Energy Storage Association as well as owner/operator of renewable and conventional generation and transmission assets serving CAISO and all other ISO/RTOs in US.

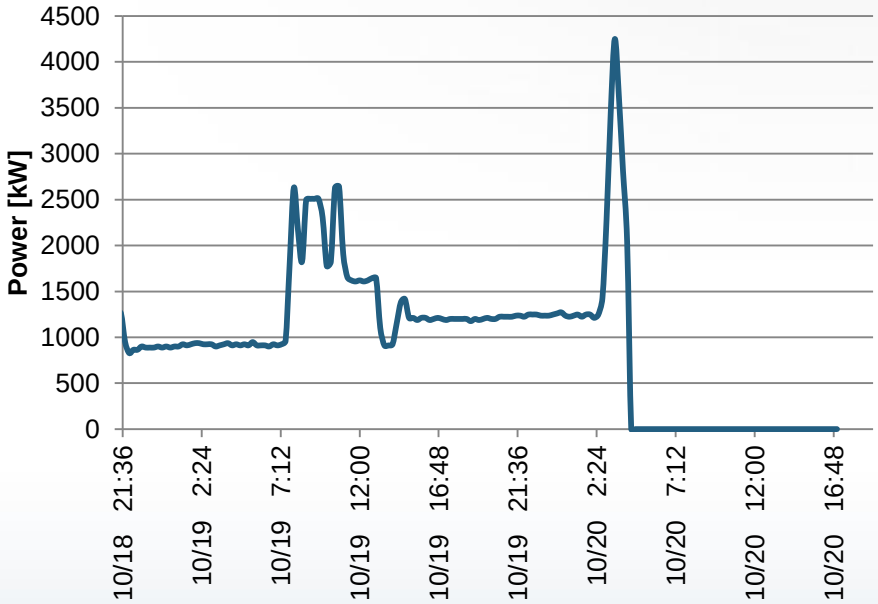
Note that LS Power's comments apply to In-Front-of-Meter resources only.

Outline

- Station Power in Conventional Resources
  - Example: Station Power for a Gas Peaker
- Single Line Diagram – Large Energy Storage System

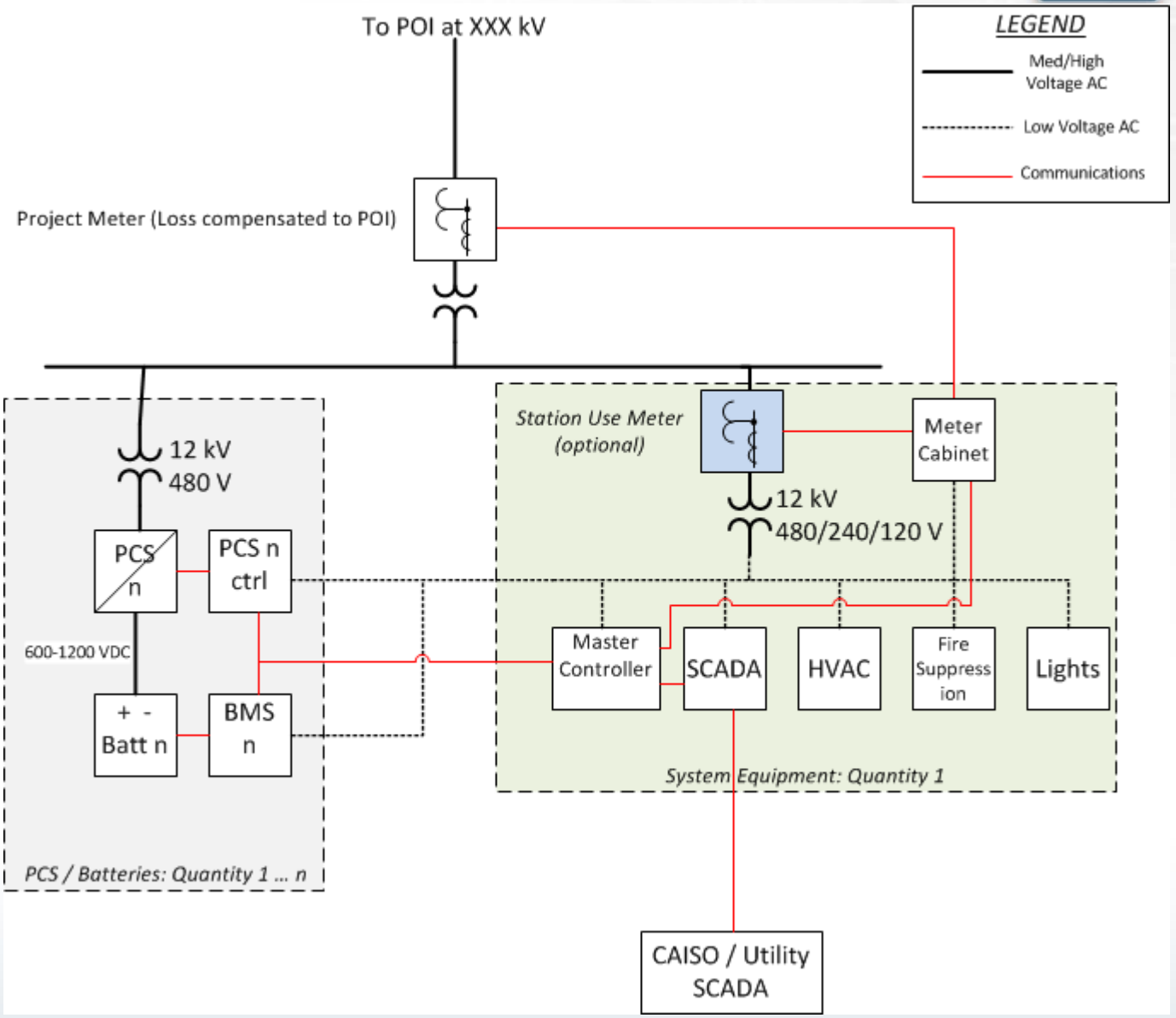
Station Power in Conventional Resources

- Single Meter Configuration is most common nationwide for other technologies
- Real example from retail settlement data for gas peaker plant below
- Note the retail meter dropping to zero after startup: all station use is being netted from generation, and settled with the ISO at wholesale rates



SLD – Large Energy Storage System

- Stylized Single Line Diagram for real battery energy storage project
- Typical layout for 10+ MW
- Separate station use meter not used in other markets (PJM, ERCOT, Hawaii, Alaska, Colorado)



Further Information

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MUAs & Station Power

Multiple-Use Application and Station Power Workshop

June 2, 2017

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Key CESA Principles for energy storage MUAs

Promote participation and efficiency from MUAs

- Keep options open but safeguard against potential bad actors
- Don't discriminate against MUAs – many current system resources fail to deliver services on occasion

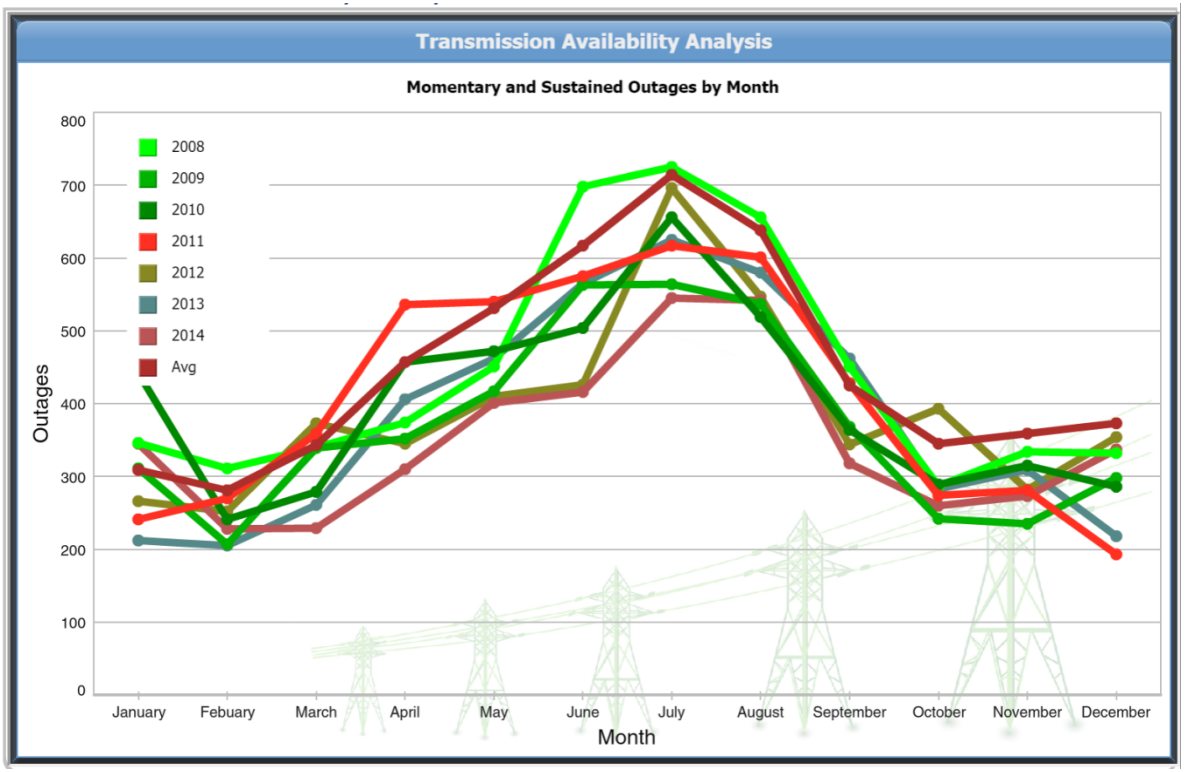
Maintain integrity for wholesale/retail and NEM accounting

- Many performance measurement systems should be allowed: meters, estimation, baselines
- Additional settlement/IT systems potentially needed in some applications

Market signals, operating needs, and price consequences should drive MUA behavior

- CPUC can direct and oversee the utility's development of signals
- No direct signals currently for Transmission or Distribution resource 'failure', e.g. a 'forced outage'
- RA, Wholesale Market, and Customer domain DO have signals, e.g. consequences reasonably clear if a service isn't delivered, directing behaviors appropriately

Example: Transmission Wires Can Be Unavailable Too



Source: NERC. http://www.nerc.com/pa/RAPA/tads/Pages/TransmissionAvailabilityAnalysis.aspx

MUA Authorization Framework

(Example Only)

All MUAs presumed workable, but 'checks' of the MUA may reveal where additional regulatory or other consideration is needed.

MUA	Check #1: Performance measurement approach should be sufficient and preserve NEM and wholesale/retail integrity, within reason.	Check #2: Ensure station power rules are appropriately reflected	Check#3: Non-discriminatory Market/price signals in place to direct behaviors.	Check #4: Consider any needs for additional operating criteria, unmanageable reliability concerns, or IT, accounting and settlement solutions.	Final Assessment
	✓	✓	✓	✓	✓
Example MUA #1	✓	✓		✓	
Example MUA #2			?		Action may be needed

MUA and Station Power Background

- CPUC deferred final action on MUAs and Station Power for BTM configurations
- CESA reviewing BTM performance measurement configurations for “checks” #1 and #2
  - Simplest to base assessments off of metering, but baselines or estimation/sampling could replace metering needs
- Key distinction for MUA is whether BTM storage is exporting or not
  - Not exporting – typically fewer issues
  - Exporting – more scrutiny needed
- Approach - bookends
  - Assume operations for MUA – review for if ‘checks’ are met.
  - Consider ‘Bad Actor’ scenario – potential for a bad actor shouldn’t *prima facie* preclude a MUA

BTM Energy Storage in Wholesale Market

Desired outcomes:

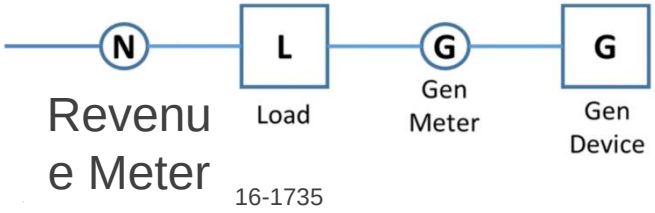
- All retail load consumption is at retail rate
- Auxiliary loads or generation services should be settled at the wholesale energy price
- Station power loads are retail but subject to permitted netting rules
- Track charging and discharge for wholesale services where applicable

Illustrative Scenarios

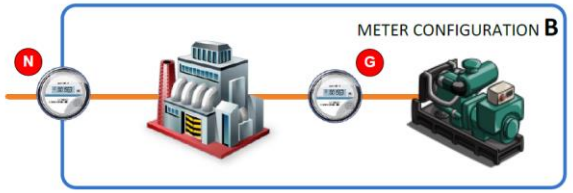
- **Scenario 1** – 2-4pm charge/4-6pm discharge *(Good actor)*
- **Scenario 2** – 2-4pm charge then self consumption *(Bad actor)*
- **Scenario 3** – Split discharge *(Combination)*

Configuration #1 – *approved today (MGO)*

Last in first out (LIFO) accounting



or



Scenario 1	2pm	3pm	4pm	5pm	6pm
Meter N	10	10	-10	-10	5
Meter G	10	10	-10	-10	0
Load	0	0	0	0	5
Wholesale	10	10	-10	-10	0
Retail (N-W)	0	0	0	0	5

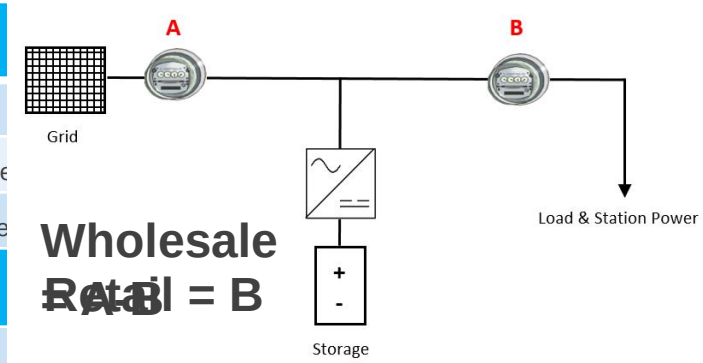
Scenario 2	2pm	3pm	4pm	5pm	6pm
Meter N	15	15	0	0	5
Meter G	10	10	-10	-10	0
Load	5	5	10	10	5
Wholesale	0	0	0	0	0
Retail (N-W)	15	15	0	0	5

Scenario 3	2pm	3pm	4pm	5pm	6pm
Meter N	15	15	-5	-5	5
Meter G	10	10	-10	-10	0
Load	5	5	5	5	5
Wholesale	0	10	-5	-5	0
Retail (N-W)	15	5	0	0	5

Slide courtesy of STEM

Configuration #2

	Scenario 1	Charge/Discharge (Good Actor)			
	Meter A	Meter B	A-B=Wholesale	B= Retail	
Time interval 1	10	0	10	0	Pay 10kWh at wholesale rate
Time interval 2	-9	0	-9	0	Earn 9kWh at wholesale rate
	Scenario 2	Default on Discharge (Bad Actor)			
	Meter A	Meter B	A-B=Wholesale	B= Retail	
Time interval 1	10	0	10	0	Pay 10kWh at wholesale rate
Time interval 2	0	9	-9	9	Earn 9kWh at wholesale rate but pay for all 9kWh consumed at retail rate*
	Scenario 3	Split Discharge (Combo)			
	Meter A	Meter B	A-B=Wholesale	B= Retail	
Time interval 1	20	0	20	0	Pay 20kWh at wholesale rate
Time interval 2	-9	9	-18	9	Earn 18kWh at wholesale rate but pay for all 9kWh consumed at retail rate*



* May need to adopt highest TOU price if it can't be distinguished when retail energy was charged.

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Key Takeaways

- Goal and purpose of MUAs is to better utilize resources, create efficiencies, provide benefits, and support reliability or other grid needs
- So long as key criteria are addressed, e.g. the ‘checks’, MUAs should be allowed
  - Presumably unreasonable to disadvantage MUAs through unique restrictions that may not apply to others solutions
- Storage OIR is proper vehicle to direct select changes, within reason, needed for storage deployments like MUAs
- Marketizing key services through price or contractual signals is effective and efficient
  - Examples include LCR contracts, wholesale market ‘no-pay’ approaches, etc.
- Performance management configurations can address key ‘integrity’ concerns of wholesale/retail and NEM accounting

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Thank You!

Questions?

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Energy for What's Ahead℠

Metering Configurations

BTM Wholesale Charging

Energy Storage Proceeding
Workshop on Multiple Use Applications
June 2, 2017

Agenda

1. Metering Configurations for Storage
   - Measurement of storage
   - Metering Configurations for IFOM storage
   - Metering Configurations for BTM storage
2. BTM Wholesale Charging
   - Staff Proposal for BTM Wholesale Charging
   - Metering and processes for BTM Wholesale charging
   - Rules and Protocols for BTM Wholesale Charging
   - MUAs today: BTM Wholesale Participation via PDR.

Metering Configurations for Storage

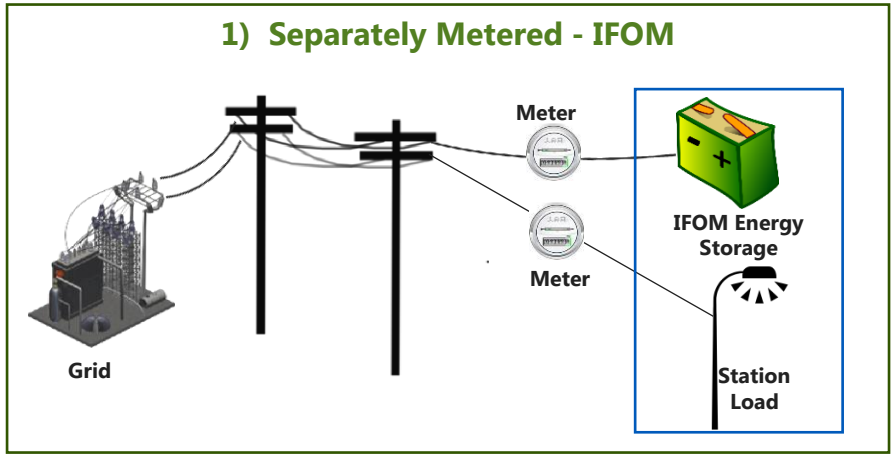
Measurement of Storage Loads

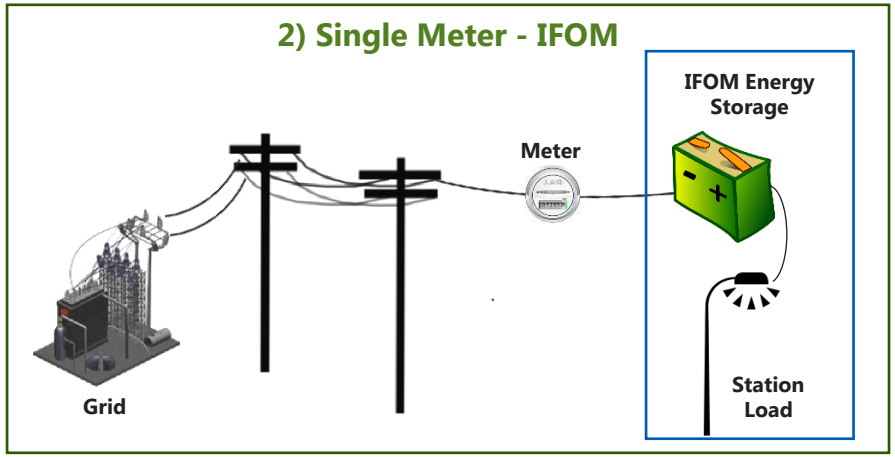
- Accurate determination of wholesale and retail activities requires direct metering configurations and associated data reduction protocols
  - While metering can identify direction of flow, capacity, and other energy attributes, protocols are required to discern the distribution of energy across the various MUA domains and services
  - Under all metering configurations, the utilities would need visibility to the type of service and timing associated with CAISO dispatches

- The nascent state of energy storage (ES) technology requires experience and actual data before ridged requirements are imposed

- Measurement methods must follow current guidelines for:
  - CAISO settlements;
  - Utility tariffs, including interconnection (Rule 21 or WDAT) and;
  - Billing system capabilities

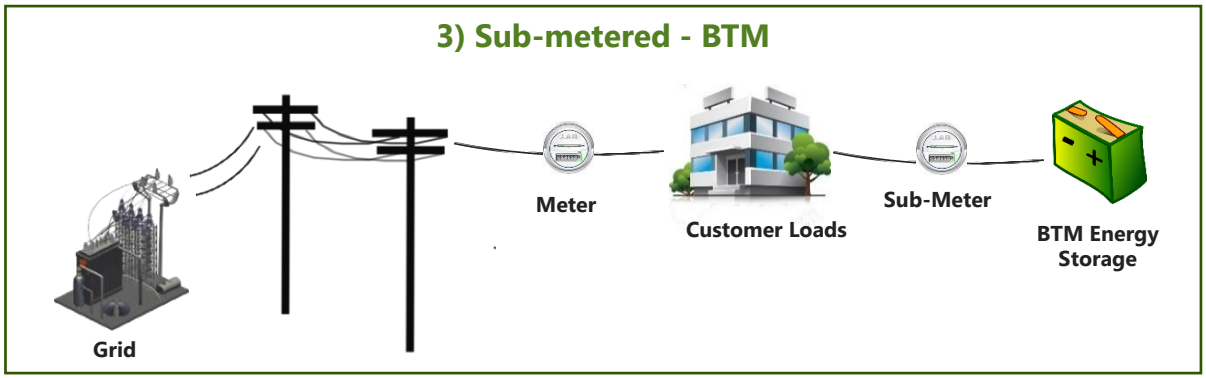
IFOM Potential Meter Configurations





- Separate metering
  - Differentiates between most wholesale and retail activities
  - Requires protocols for Track 2 netting provision and when system is idle
  - Direct measure is possible for Track 2 netting
- Single meter
  - Track 2 defined station power would need to be established through engineering study or statistical methods
  - A fixed set aside (i.e., calculated amount) of kW and kWh would be used for retail billing determinants
  - Fixed set aside is more uncertain if charge/discharge pattern is not pronounced
- Calculated method
  - Engineering study or mode analysis to determine all station power billed amounts
  - Will need to account for variability in usage

Potential BTM Configurations



- BTM Wholesale charging requires sub-metering in addition to specific protocols to address:
  - Tracking of wholesale activity for CAISO settlements
  - The Track 2 netting provision applies only to ES retail loads
  - The dynamic nature of general service load precludes the use of a fixed set aside
  - Sub-meter must be utility grade
  - Additional meters and telemetry may be required by the service domain controlling entity
- Metering costs vary depending on system size and wiring requirements
  - For standard installation utility metering comprises ~1% of total project costs
  - Overall metering scheme costs need to account for telemetry and additional metering
- The PDR can use a single meter to measure wholesale and retail activity
  - Standard metering configurations provide access to wholesale activities
  - Optional sub-metering increases flexibility of resource and accuracy ES attributes
  - Additional meters and telemetry may be required by the service domain controlling entity

BTM Wholesale Charging

Summary: BTM Wholesale Charging

- Rules and protocols must be developed to preserve the distinction between wholesale and retail activity, and to prevent opportunities for manipulation and gaming,
- These rules must anticipate a wide range of scheduled or unscheduled storage operations that complicate the separate of wholesale and retail activity. The rules will therefore be complex and will require significant time and effort to develop.
- Once rules and protocols have been defined and adopted, complex operational processes will need to be developed and implemented.
- In the interim, PDR offers an opportunity for BTM resources to offer service to the wholesale market, and expansion of PDR is in development.

The BTM Wholesale Charging Proposal
(January Joint Staff Proposal)

- **A BTM Device would be allowed to charge at wholesale if the following conditions are met:**
  - Must have dedicated sub-meter
  - Must participate in CAISO market
  - Must be subject to Must-offer obligation (i.e., have RA contract)
  - Must operate in response to CAISO schedule or dispatch
  - **Must export energy back to the grid**
  - Must not be compensated via NEM 1.0 or 2.0
- **Key issue: Must develop protocols to separate wholesale/retail transactions and uses**
  - Must prevent ability to charge at wholesale and discharge to serve retail load
- **Initial Observations/Comments:**
  - Exporting 100% of discharge energy to the grid seems challenging if not unrealistic. Therefore, rules and protocols must anticipate a mixture grid export and retail usage.
  - This proposal requires complex retail bill adjustments.
  - RA contracts are not necessary from a technical or process perspective. Also, DERP resources cannot provide RA.

Metering and Process Requirements
(This is an initial list and should not be considered complete or final.)

- Metering: A revenue grade sub-meter is required
  - IOUs must be able to monitor storage activity independent of other retail load
- New processes: Once rules and protocols are adopted, IOUs will likely need to implement the following functions into billing, accounting, and communications systems:
  - IOU capability to calculate, verify, and track wholesale storage activity and distinguish this from retail activity. This potentially includes tracking the mixture of wholesale and retail energy stored in the battery at any given time.
  - IOU capability to adjust the retail bill based on wholesale activity, potentially subtracting energy or adding energy to the retail bill in any given interval.
- Upgrading systems to accommodate these functions may be complex and may require significant time and expense.

Rules and Protocols for Wholesale Charging Must be Developed (**This is an initial list and should not be considered complete or final)**

- Rules and protocols must be created to preserve the absolute distinction between retail activity and wholesale activity.
- Such rules are necessary to prevent using wholesale power to serve retail load, to prevent gaming and market manipulation, and to prevent any activity that would lead to inappropriate cost shifting.
- These rules and protocols will be complex, and must anticipate a wide range of scheduled or unscheduled storage operations, such as the following situations:
  - The storage device charges at wholesale, but then discharges to meet retail loads rather than export to the grid.
  - The storage device partially charges at retail, and partially charges at wholesale, and then discharges partially exporting to the grid and partially serving retail load.
  - The CAISO discharge schedule is modified after the charging period, and consequently the battery contains excess (or insufficient) charging energy to meet the CASIO schedule
  - The storage device does not follow the CAISO schedule.
- Additional rules questions must also be resolved:
  - What is the appropriate interconnection agreement, given that a FERC-jurisdictional interconnection is required for direct participation in the wholesale market?
  - For these resources, what is the proper recovery and allocation of transmission and distribution costs?
  - What additional protocols are necessary to accommodate resources that are providing distribution services, in addition to customer and wholesale services?

MUAs today: BTM Wholesale participation is currently possible via PDR

- Storage may bid energy (i.e. net load reduction) into the Day Ahead market
  - Consumption (i.e. net load increase) and frequency regulation products are under development.
- All energy is retail: During CAISO dispatch, energy is used to serve retail load
  - Any bill management benefits that would occur through storage operation still occur during the CAISO dispatch
- Wholesale compensation is not available for energy exported to the grid
  - However, this is not a constraint whenever the customer's retail load exceeds the storage dispatch.
- Sub-meter is not required.
  - A Sub-mater may be optionally used if the customer prefers to have PDR performance measurements based on storage operation alone (independent of other retail load).

Summary: BTM Wholesale Charging

- Rules and protocols must be developed to preserve the distinction between wholesale and retail activity, and to prevent opportunities for manipulation and gaming,
- These rules must anticipate a wide range of scheduled or unscheduled storage operations that complicate the separate of wholesale and retail activity. The rules will therefore be complex and will require significant time and effort to develop.
- Once rules and protocols have been defined and adopted, complex operational processes will need to be developed and implemented.
- In the interim, PDR offers an opportunity for BTM resources to offer service to the wholesale market, and expansion of PDR is in development.

REMAINING ISSUES

Time
Compensation
Barriers to storage outside of MUA

Time & Compensation

Time: Paper discusses coincidence and simultaneity of services, concludes that rules for provision of services will avoid most double compensation issues, and asks parties for input on whether a rule should be developed now.

Compensation: Paper establishes the following rule:

"16. Incrementality: In paying for performance of services, compensation and credit may only be permitted for those services which are incremental and distinct"

, and asks questions of parties to supplement.

Barriers to Storage Outside of MUA

Customer

Exclusion of resources behind-the-meter in certain solicitations, particularly Aliso Canyon. Paper agrees that storage resources in all domains be able to compete.

Distribution

Lack of defined products and requirements for distribution level services. Paper lists the services identified the four services thus far identified in Integrated Distributed Energy Resources (IDER) and Distribution Resources Plan (DRP) proceedings.

Wholesale Market

- Develop product for PDR to provide frequency response. CAISO is addressing in Frequency Response 2.
- MGO baseline method for PDR storage resources. Done in ESDER Phase 1.
- Prohibition of NEM resource participation in wholesale market.
- Amend NGR to allow for resources to be taken “out of market”. To be addressed in ESDER.

NEXT STEPS

Comments are due on June 16, 2017
Reply Comments are due on June 23, 2017

Please also include:

- Any issues discussed at workshop;
- Prioritization of issues;
- Be as specific as possible about active or planned use cases and include graphics, schematics, and pictures.

Thank You!

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