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Demand Response Load Impacts: How do you count them?

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Agenda

- Definitions
- Background
- Program Design
- Resource Adequacy
- Cost of Service
- Pricing DR programs
- Wrap-up

Three Types of Demand Response Programs

- Dispatchable programs include:
 - ◆ Interruptible / curtailment
 - ◆ DLC programs (residential & small commercial)
 - ◆ Auto-DR (commercial & industrial)
- Event-based pricing programs include:
 - ◆ CPP
 - ◆ PTR
- Non-event pricing programs are not considered here:
 - ◆ TOU
 - ◆ RTP



Is DR a Resource or Not?!?!?

- Are DR program impacts considered a resource or a load reduction for . . .
 - ◆ Program design?
 - ◆ Resource planning & forecasting?
 - ◆ Cost of service?
- How you answer this question may depend on:
 - ◆ **Program type**
 - ◆ Customer class
 - ◆ Reliability, size, or age of the program
 - ◆ ISO definitions
 - ◆ Regulatory requirements
 - ◆ Cost allocation methods



Program Design – It's a Resource

- Nearly all DR programs are evaluated based on one of the accepted cost-benefit tests (i.e. TRC)
 - ◆ Program impacts deliver benefits in the form of avoided energy, capacity, and T&D costs
- Incentives and payments for dispatchable programs are usually based on avoided costs
 - ◆ Capacity value - \$/kW avoided
- Rates and rebates for pricing programs are also based (to some extent) on avoided costs
 - ◆ Most have a capacity component, but revenue neutrality, and additional fixed and variable costs may also play a role

NOTE: This is where the program gets credit



Resource Planning – It Depends . . .

- At least some DR program impacts are usually included as a resource for planning
- But how do utilities make the distinction?
 - ◆ Dispatchable vs. event-based pricing vs. non-event programs
 - ◆ Size of the program
 - ◆ Reliability of impacts / program maturity
- Consistency is the most important thing



Resource Planning – Utility Experience

- SCE and OG&E both currently define a dispatchable program as a resource and exclude pricing programs
 - ◆ Right now that includes the DLC, interruptible, and demand bidding programs
 - ◆ There is some uncertainty about the desire to exclude pricing programs in the future
- NV Energy defines programs on reliability and MW
 - ◆ The Cool Share program (AC Cycling) had over 50 MW in 2008 and is operated as a resource by their system operators – A proven program

Cost of Service – It Should Be

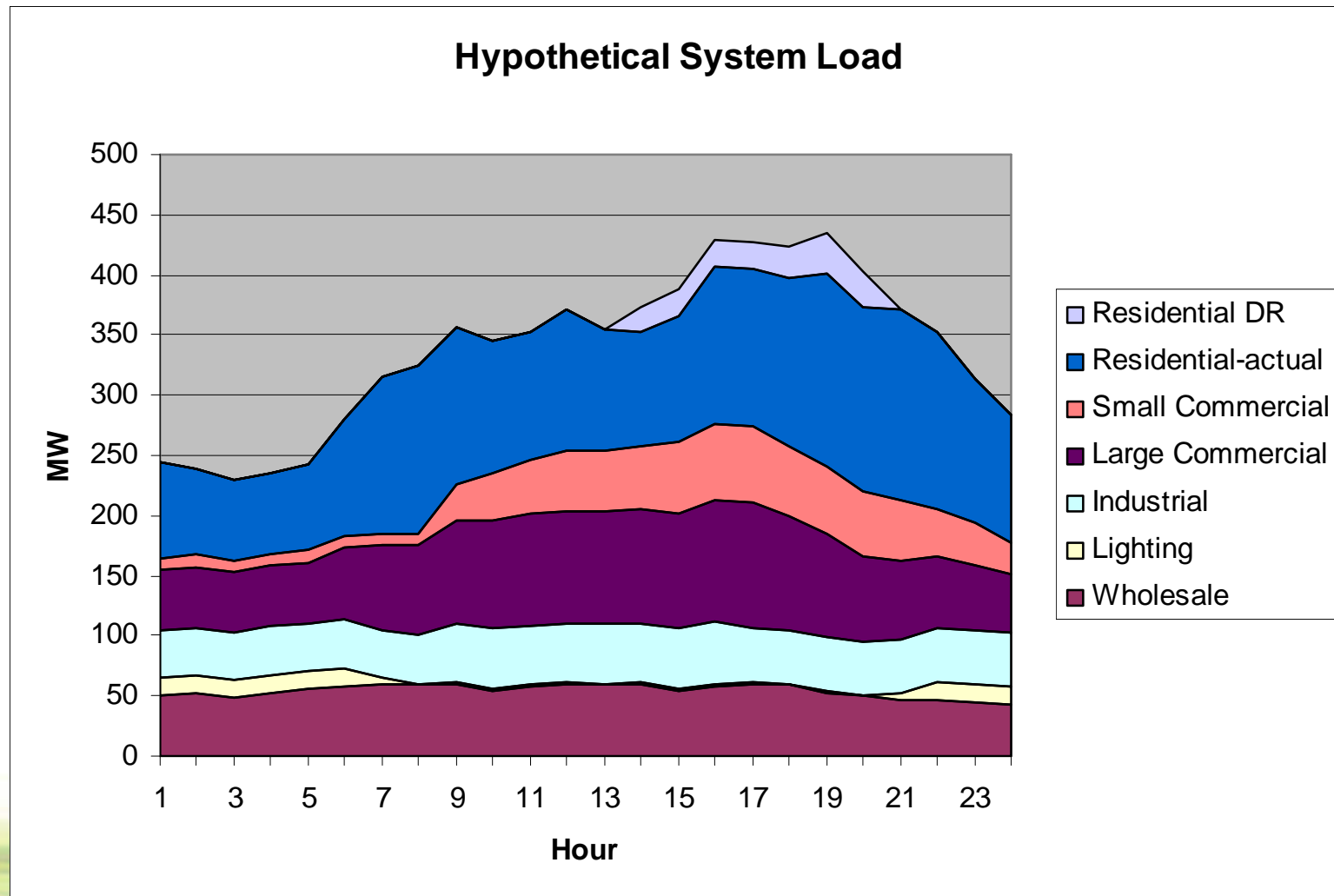
If the program is used as a resource, it should be treated as a resource in cost allocation

- Most utilities use some form of CP or related method for cost allocation
 - ◆ A customer class' share of costs is based on the class contribution to system peak
- If a DR program is called on the system peak and the impact lowers a class' contribution to peak, then should COS be adjusted to reflect what would have been?

The short answer is yes.



The Problem with DR & Cost of Service



The Impact of the Problem

| | Based on actual load | | With DR added back | |
|------------------------|----------------------|-------|--------------------|-------|
| | Peak at hour 16 | | Peak at hour 19 | |
| | MW | % | MW | % |
| Wholesale | 58 | 14.3% | 53 | 12.2% |
| Lighting | 1 | 0.2% | 1 | 0.2% |
| Industrial | 53 | 13.0% | 45 | 10.4% |
| Large Commercial | 100 | 24.6% | 85 | 19.6% |
| Small Commercial | 65 | 16.0% | 57 | 13.1% |
| Residential-actual | 130 | 31.9% | 193 | 44.5% |
| System Load | 407 | | 434 | |
| Residential DR at peak | 23 | | 32 | |



The Long Answer . . .

- Programs impacts that are counted toward resource adequacy *should* be added back in when calculating cost of service
 - ◆ Dispatchable programs generally fall into this category
- If DR impacts associated with these programs are not added back in for COS:
 - ◆ The coincident peak for classes with participants is underestimated, lowering rates for that class at the expense of all other classes
 - ◆ Nonparticipants in the same rate class benefit
 - ◆ The utility underestimates their true peak load
 - ◆ The event could move the system peak, further affecting allocations to all classes



It Really Comes Down To ...

- How does the system operator view the program?
 - ◆ Whether the operator chooses to meet the load with a DR resource or a supply resource **should not** affect the allocation of costs.
- Have the benefits of the load reduction already been included in the pricing or incentives?
- Lack of confidence in or uncertainty of impact estimates can be an issue
 - ◆ Stakes are high – real dollars hang in the balance



Current Practices

- Every utility we talked to agreed that in principle impacts from dispatchable programs should be added back for COS
- But, only 4 out of 5 actually add the impacts back in. Why?
 - ◆ The programs are emergency programs that very rarely coincide with a peak day
 - ◆ The programs are not big enough to make a difference in COS allocation
- OG&E does add DR impacts back in for COS
 - ◆ Add back the M&V hourly avoided MW
 - ◆ Standard practice for the last 5-10 years
 - ◆ Do not consider pricing programs



What about Pricing Programs?

- Event-based pricing programs such as CPP and PTR complicate things
 - ◆ In some sense because they are event driven, they are operated like a resource and could be considered dispatchable
 - ◆ Most utilities plan to call several events each summer and plan to hit the highest demand days
 - ◆ Pricing and rebates are generally based on avoided costs
 - ◆ Utilities want to include impacts in resource adequacy
- At this point, most utilities don't have programs large enough to make a difference . . .

Pricing Programs in the Future

- Throughout the country utilities are ramping up Event-based DR pricing programs
 - ◆ SCE and SDG&E are moving forward with PTR for all residential customers with estimated impacts in the hundreds of MW
 - ◆ BG&E is also moving forward with PTR
 - ◆ OG&E, Idaho Power, CPS and others are looking at pilot programs for various dynamic pricing programs
- At some point the industry will have to address this issue for event-based pricing programs

What do you think?



Contact Information

Research is part of Global Energy Partners new Load Analysis Subscription service

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