Demand Charges

Presentation to Review Panel
July 29, 2013

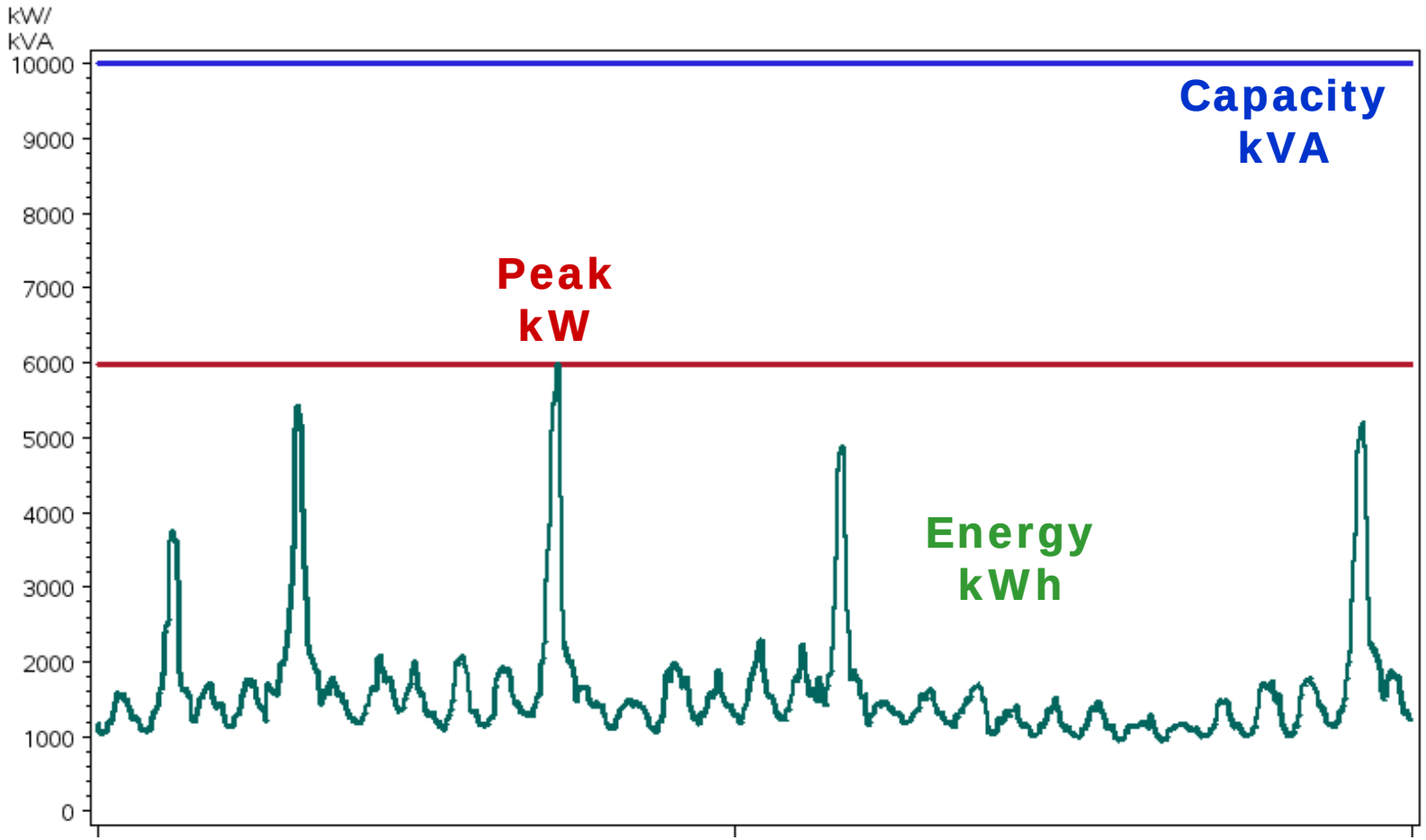
Rate Policy Review: Where We Are (no final decisions made yet)

- ✔ Residential Rates
  - BSC at 75% of MC of customer service.
  - Low Income Program at 50% subsidy.
- ✔ Energy Efficiency
  - Time of Use Rates for Medium Network.
  - BSC at 100% of MC of customer service for all non-residential customers.
- Demand Charges
- Decoupling

Today's Topic: Demand Charges
(Medium, Large and High Demand Customers)

- Increasing Demand Charges
  - Objectives and methodology (review)
  - SCL Proposal: 50% MC of distribution
- Demand Charge Structure
  - kVA vs. kW
  - Bill impacts
  - Pros and cons
  - SCL Proposal: Hybrid kW kVA solution
- SCL Proposal: 50% MC of distribution, kVA and kW Hybrid

Review: kWh vs. kW vs. kVA

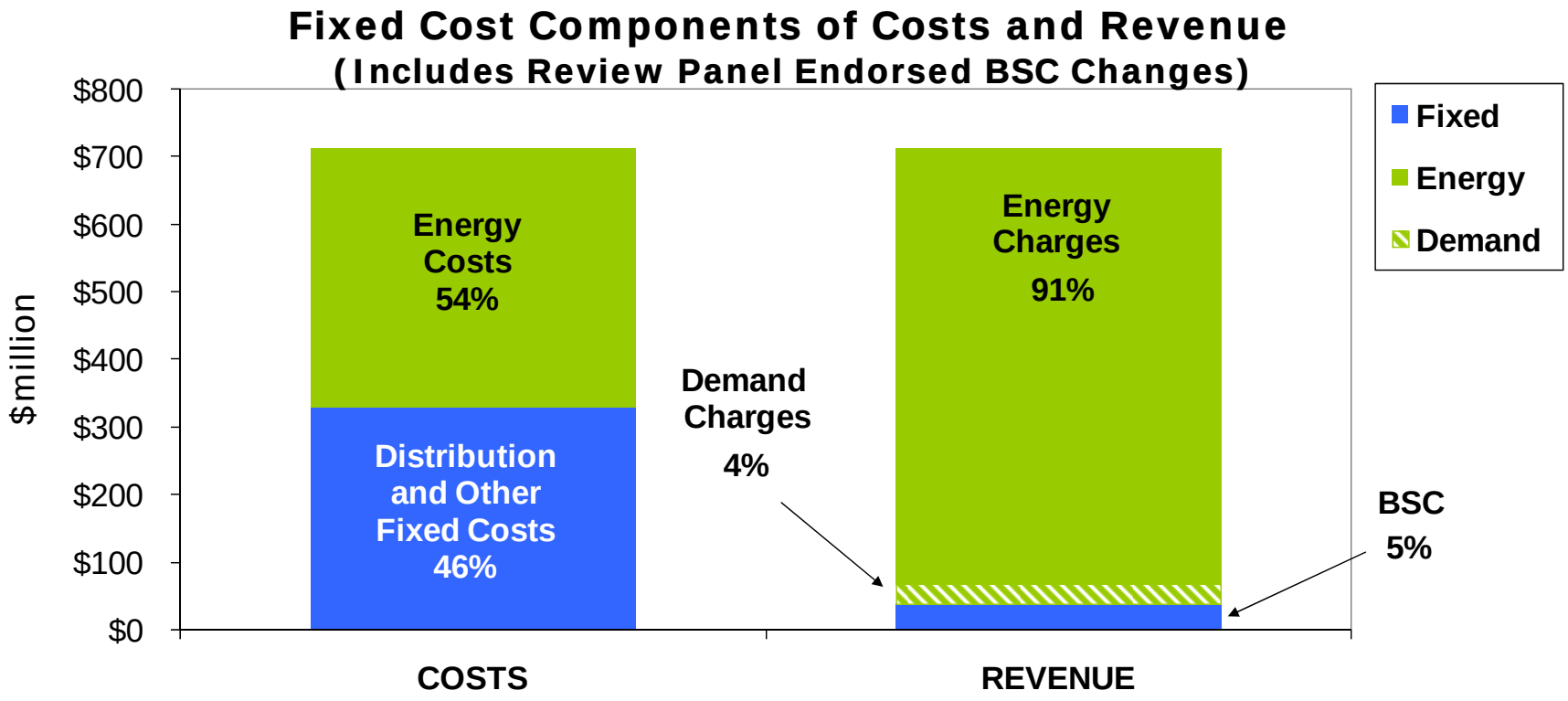


Demand Charge Level

What costs should be recovered by demand charge?

Review Objective:
Balance Variable vs. Fixed Cost Recovery

- Current revenue make up is heavily skewed to variable energy charges.



Fixed Cost Recovery: Why it's Important

- Utility gets: Improved financial stability
  - Stagnant load growth.
  - Proliferation of conservation and distributed generation.

- Customers get: More equitable rates
  - Current practice of recovering fixed per customer costs with variable energy charges results in some customers' costs actually being paid for by other customers.
    - Low or zero use customers would pay for the true cost of the service and infrastructure needed to serve them.
    - Those that benefit from energy efficiency measures would still pay for the cost of infrastructure installed to serve them.

Demand Charge Methodology

- SCL demand charges are designed to recover a certain percentage of distribution marginal cost.
  - Currently recover 16% (25% of distribution revenue requirement).

For All Medium, Lg, HD Customers	Network		Non-Network		Total
Distribution Costs	MC ($M)	% in Demand Charge	MC ($M)	% in Demand Charge	MC ($M)
In Service Area Transmission	$6.0	5%	$19.6	10%	$25.6
Substations	$4.7	5%	$13.3	10%	$18.0
Wires, etc.	$45.2	5%	$72.4	10%	$117.6
Transformers	$6.7	100%	$6.0	100%	$12.7
Transformer Losses	$0.3	50%	$1.0	50%	$1.3
Service Drops	$1.1	100%	$1.2	100%	$2.2
Meters	$0.3	5%	$0.7	10%	$1.0
Total Marginal Cost	**$64.3**		**$114.0**		**$178.3**
$ Collected By Demand Charges		**$10.7**		**$18.2**	**$28.9**
% of MC Collected by Demand Charges		**17%**		**16%**	**16%**

- Surveyed LPPC utilities on percentage of distribution revenue requirement (more common methodology than MC) collected by demand charge.
  - Average: 66%.
  - Range: 20% to 100%.

Demand Charge Policy Options and Recommendation

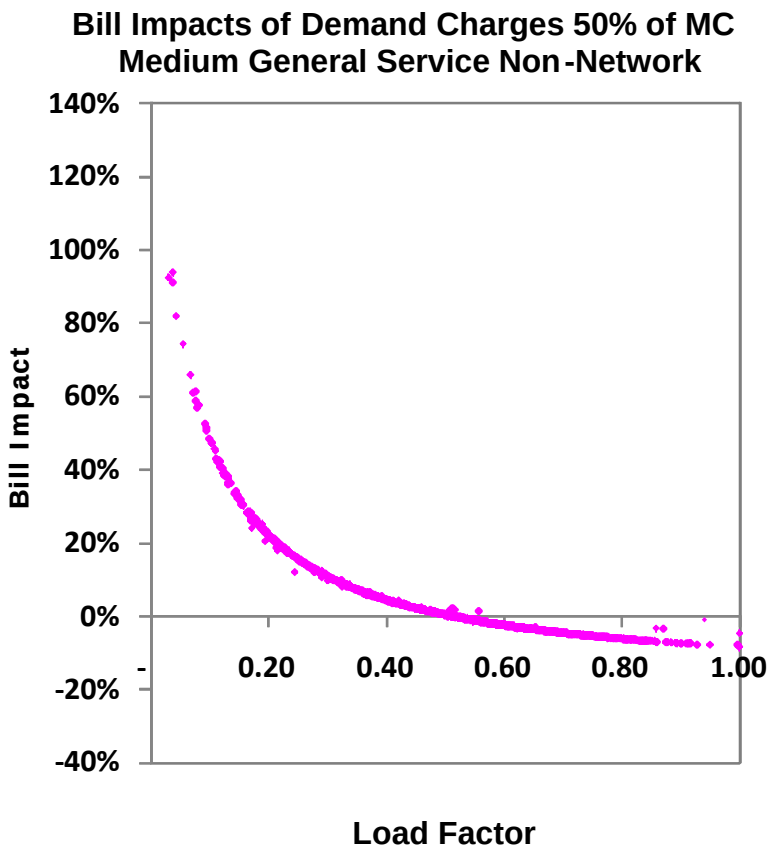
- Agreement at last RP meeting that demand charges should be higher. But how much higher?

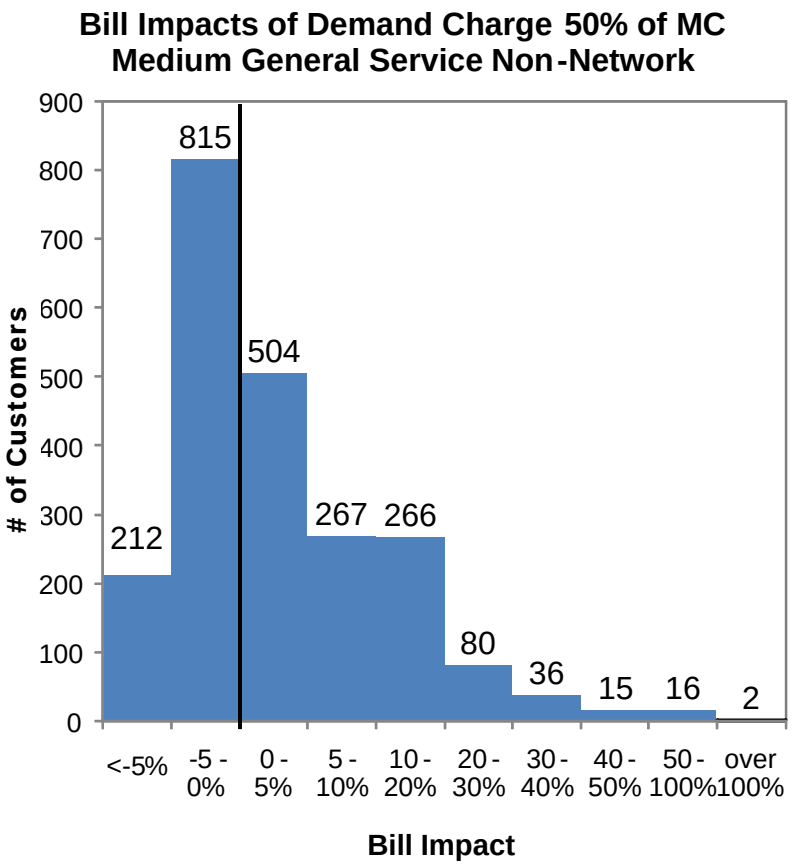
Demand Charge Policy Options					
% Distribution MC	**Current 16%**	**25%**	**50%**	**75%**	**100%**
% Distribution RR	25%	38%	**76%**	115%	153%
% of Total RR	4%	6%	**13%**	19%	25%
Example Resulting Rate Structure (Med Std GS)					
Demand ($/kW)	2.13	3.00	**5.95**	8.90	11.86
Energy (¢/kWh)	5.66	5.39	**4.60**	3.81	3.02
% Energy MC	128%	122%	**104%**	86%	68%

- SCL Recommendation: Increase to 50% of distribution MC.

Bill Impacts of Higher Demand Charges

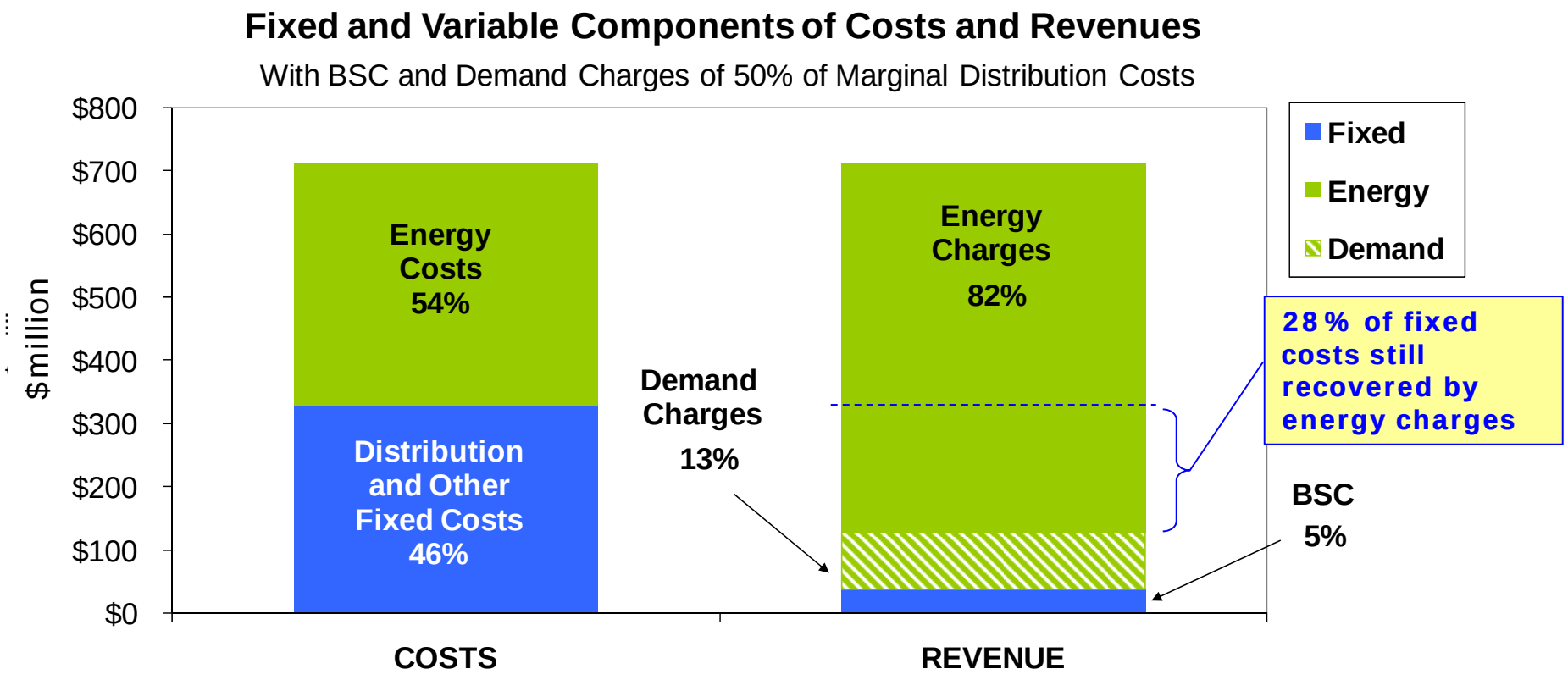
- Bill impacts depend on load factor (proportion of average use to peak).
  - Customers with volatile or intermittent usage would likely see their bill go up.
  - Customers with steady round-the-clock usage would likely see their bill go down.





Cost – Revenue Balance with Demand Charge at 50% of MC

- Collecting 50% of MC of distribution increases percentage of revenue collected by demand charges from 4% to 13%.



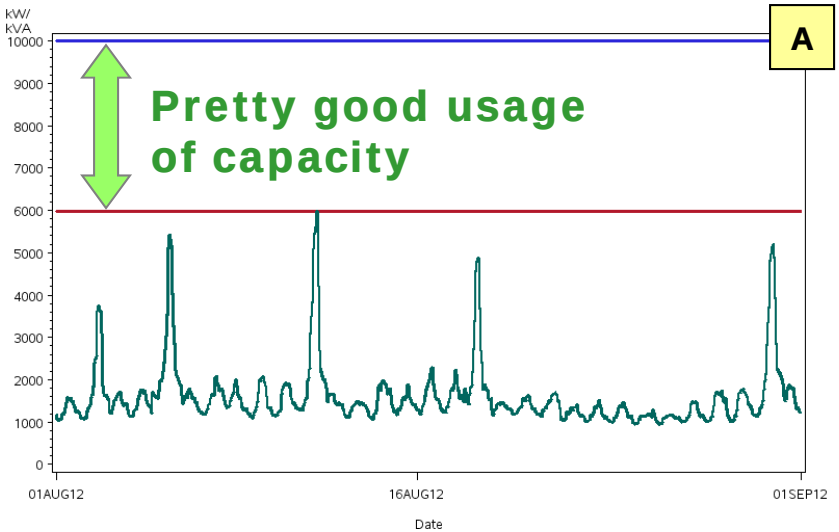
Demand Charge Structure

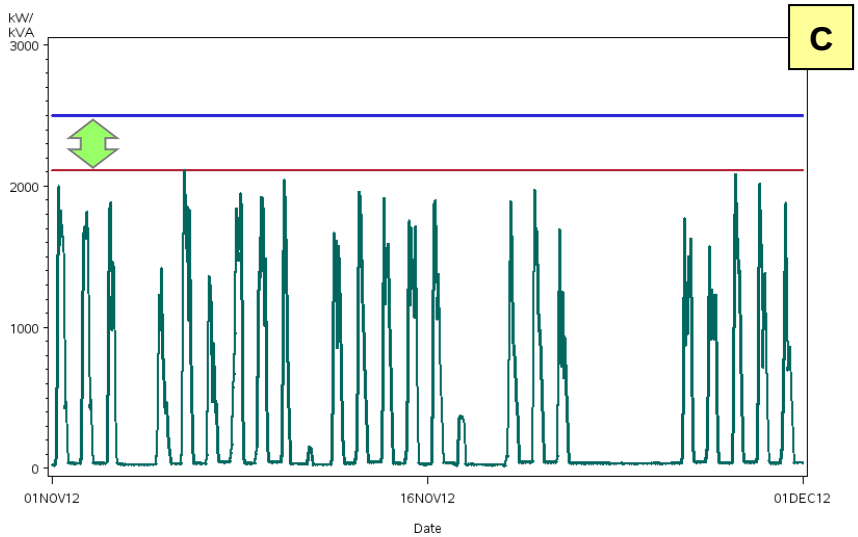
kW vs. kVA

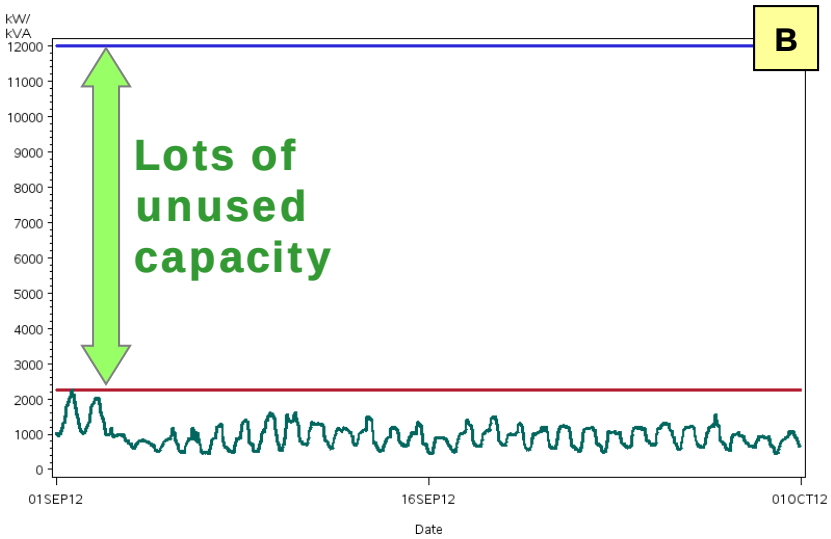
Customer Classes and Demand Charges Using kVA

- kW measures peak use, kVA measures capacity.
  - Capacity a more appropriate measure for distribution investment cost.
- Replace kW with kVA in rate schedules?
  - SCL could collect for distribution costs via a kVA capacity charge instead of peaking kW demand.
  - Defining customer classes on installed kVA instead of peak kW would give customers more stability since it is unaffected by behavior.
- Note: kVA charges could still collect 50% of distribution MC, but would impact individual customers differently than a kW charge.
  - Customers with lots of unused installed capacity would see a bill increase.
    - Currently, other customers are paying for this unused equipment.
  - Customers already using most of their capacity could see a bill decrease.

Bill Impacts of Moving to kVA Demand Charges







- A customer's bill impact would depend on how much of their installed capacity they are currently using.
  - Customer A = no change
  - Customer B = bill increase
  - Customer C = bill decrease

kVA Pros and Cons Summary

Pros

- More equitably charges customers based on amount of distribution system required to serve them.
- Incentivizes right-sizing of service connections upfront.
- Stable customer class assignment removes incentive for false loading.
- Removes perception barrier for conservation.

Cons

- Cannot be impacted by customer behavior: Reduces incentive for customers to reduce peak each month.
- No TOU component: reduces incentive for customers to shift peak use to light-load hours.
- Billing implementation costs and challenges.

Hybrid Solution: A 50/50 combination of kVA and kW

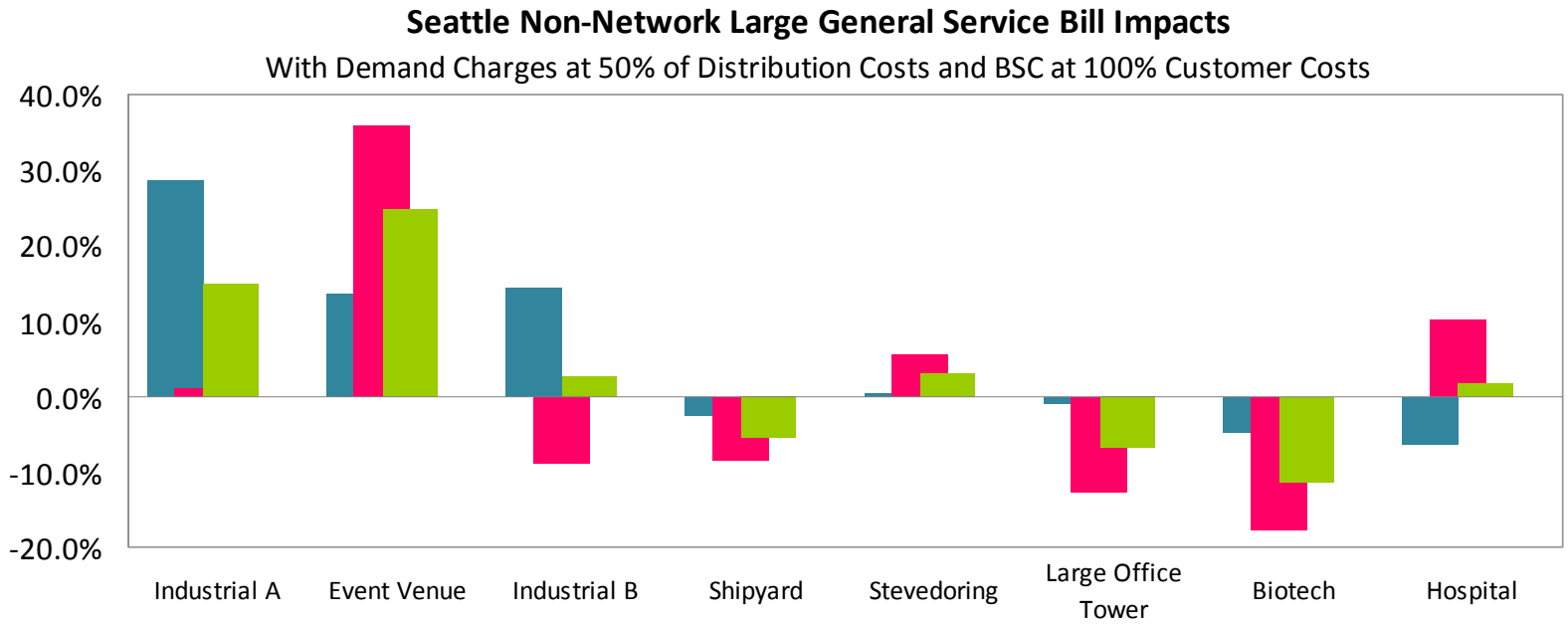
SCL Proposal: kW/kVA Hybrid

- SCL Proposal:
  - Define customer classes on installed kVA.
  - kW peak demand charge collects 25% of distribution MC.
  - kVA installed capacity charge collects 25% of distribution MC.
  - BSC collects 100% of customer cost MC.
  - Energy charge collects remaining revenue requirement.

Example Rate Schedule

Large Network (LGD)		Current	50% Distribution MC		
			All kW	All kVA	Hybrid
Energy	kWh Peak	$0.0806	$0.0588	$0.0588	$0.0588
	kWh Off-peak	$0.0537	$0.0392	$0.0392	$0.0392
Demand	kW Peak	$3.57	$11.74	$0.00	$5.87
	kW Off-Peak	$0.23	$0.23	$0.00	$0.23
Capacity	kVA	$0.00	$0.00	$3.24	$1.62
	BSC	$0.00	$16.39	$16.39	$16.39

Bill Impacts



	Industrial A	Event Venue	Industrial B	Shipyard	Stevedoring	Large Office Tower	Biotech	Hospital
kW Charges	28.7%	13.5%	14.3%	-2.6%	0.4%	-1.0%	-4.9%	-6.4%
kVA Charges	0.9%	35.9%	-8.9%	-8.6%	5.6%	-12.8%	-17.8%	10.1%
Hybrid	14.8%	24.7%	2.7%	-5.6%	3.0%	-6.9%	-11.3%	1.8%
Load Factor	14%	15%	23%	43%	44%	51%	69%	83%
Peak % of Capacity	75%	28%	81%	46%	32%	63%	76%	18%

(Note: the above references a sample customer class for illustrative purposes)