

# Distributed Generation (DG) and Electric Rates

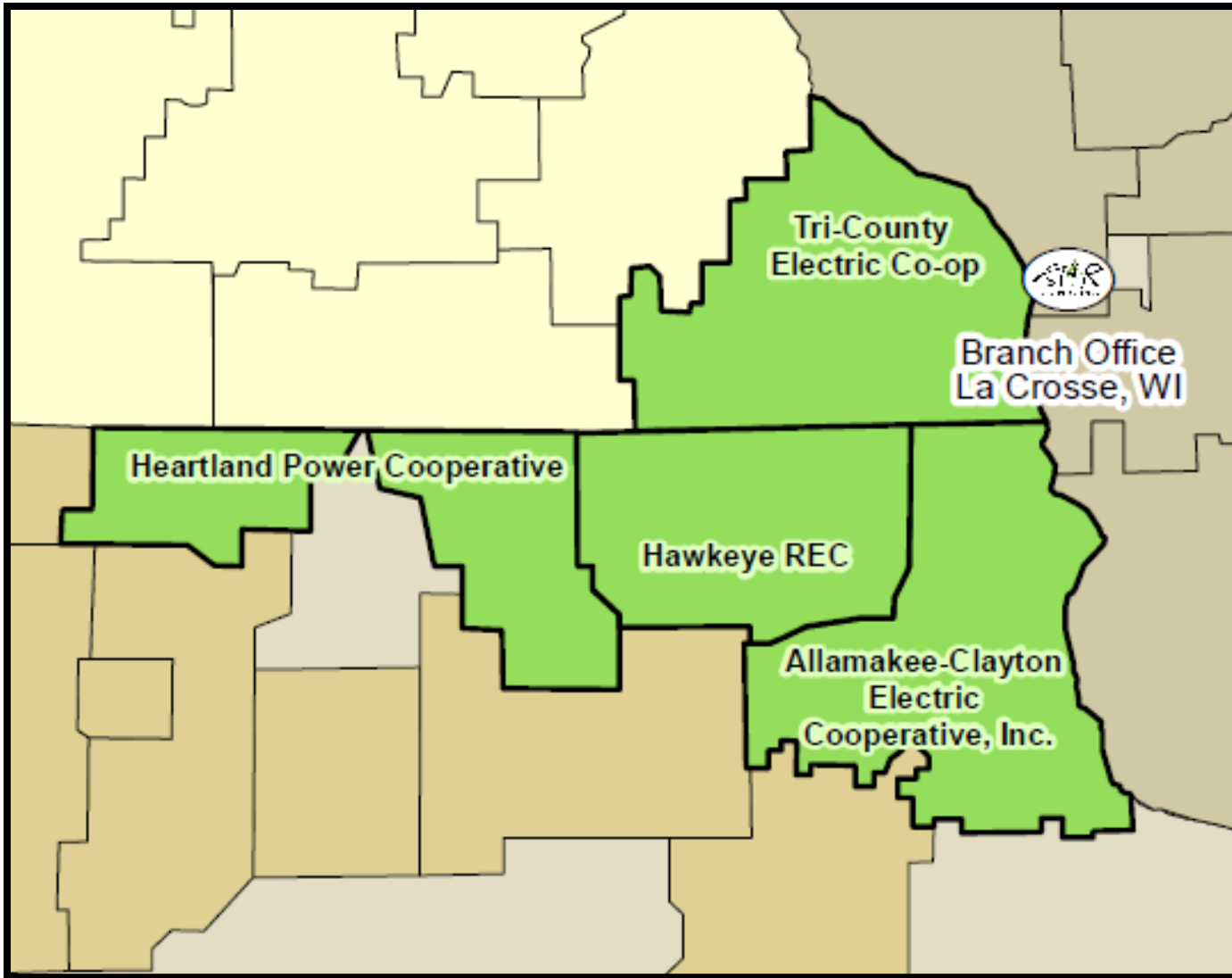
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# DG Retail Electric Rates Overview

- DG rates and policies – four electric cooperatives
- Growth in Solar PV
- Reduced Revenue from DG
- DG Cost-of-Service Review
- Retail Rates Options for DG



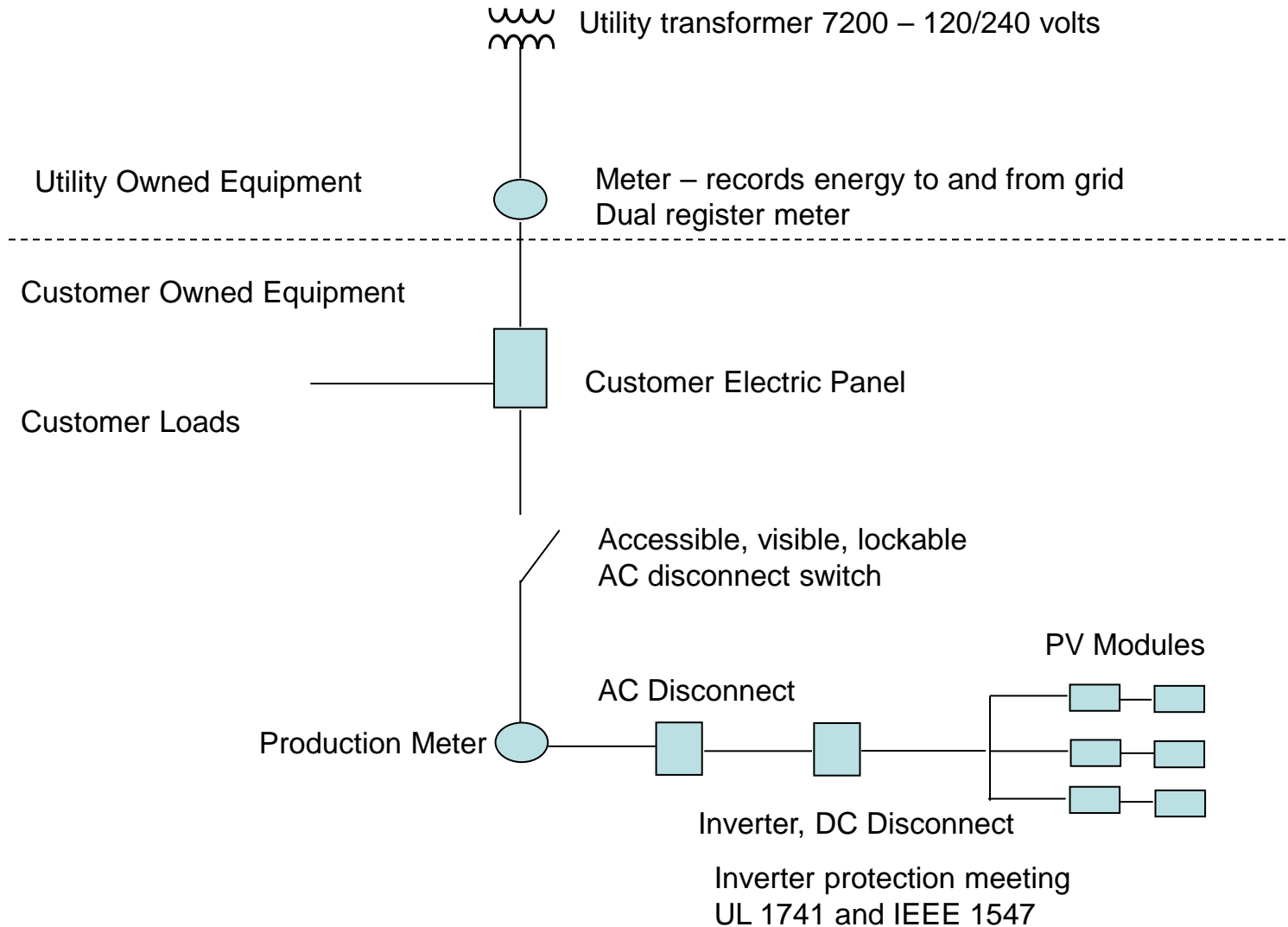
# Distributed Generation (DG)



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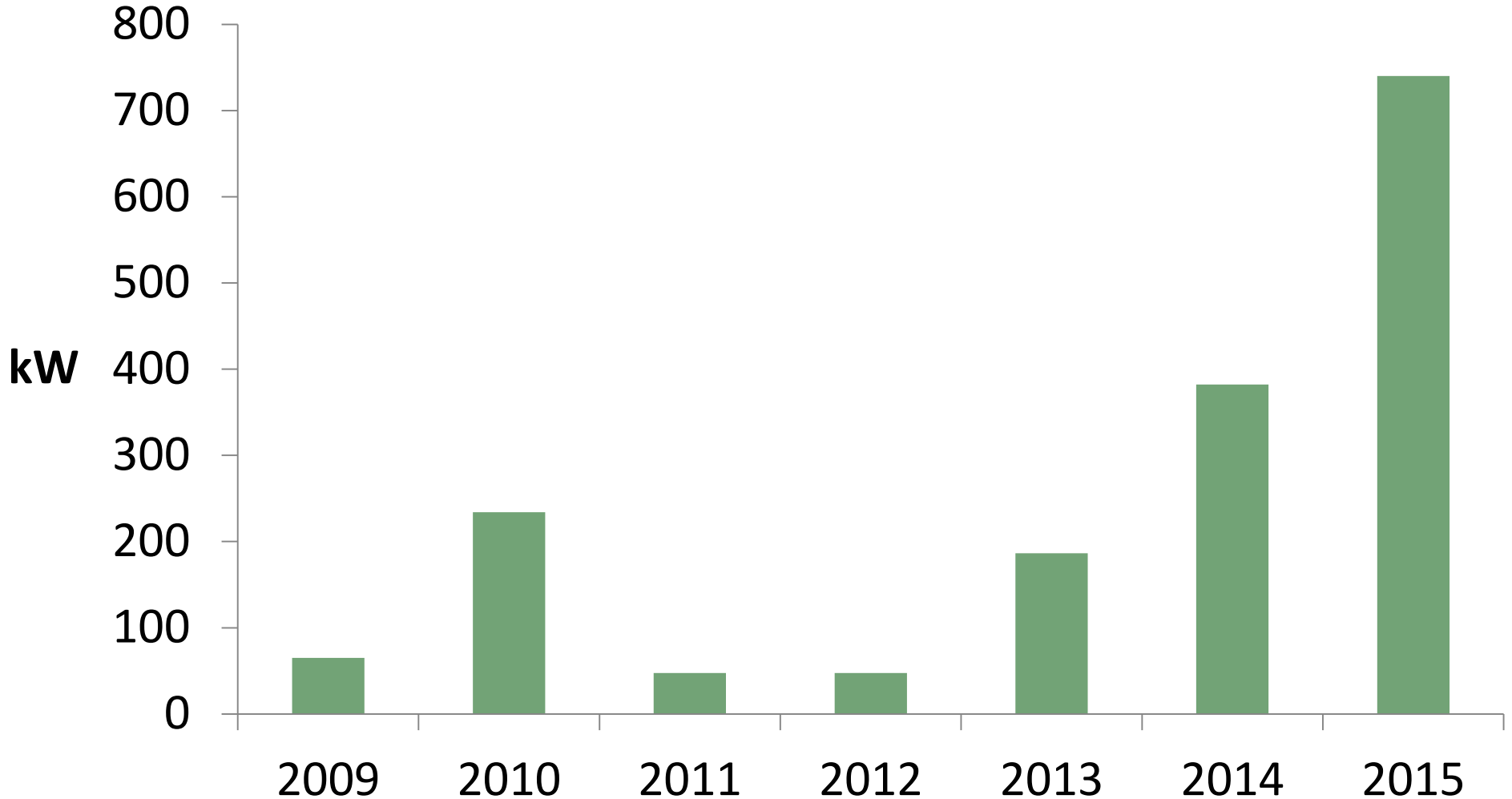


# DG One-Line

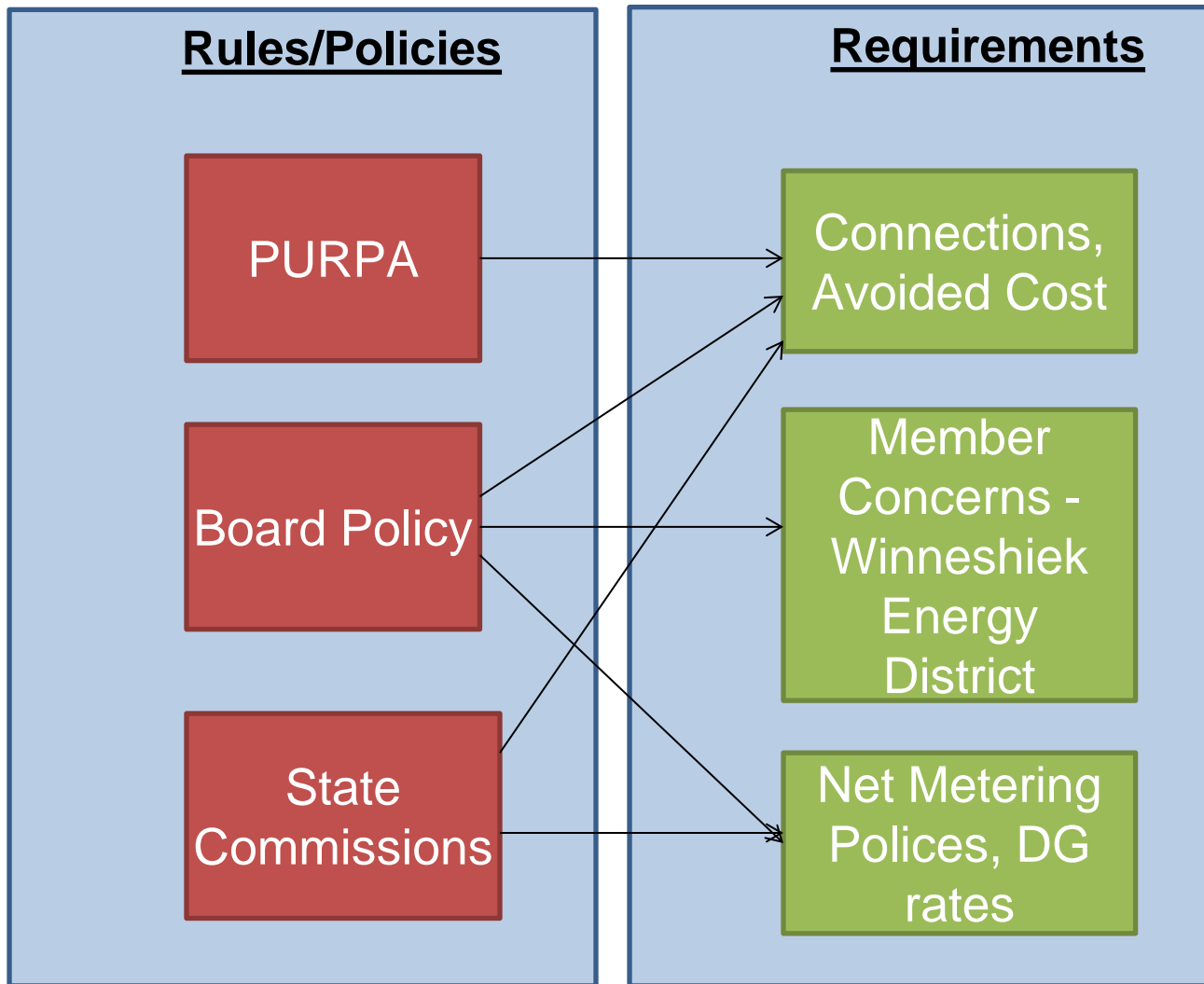


# Annual DG Nameplate Capacity at a Cooperative

Average Nameplate – 20 kW

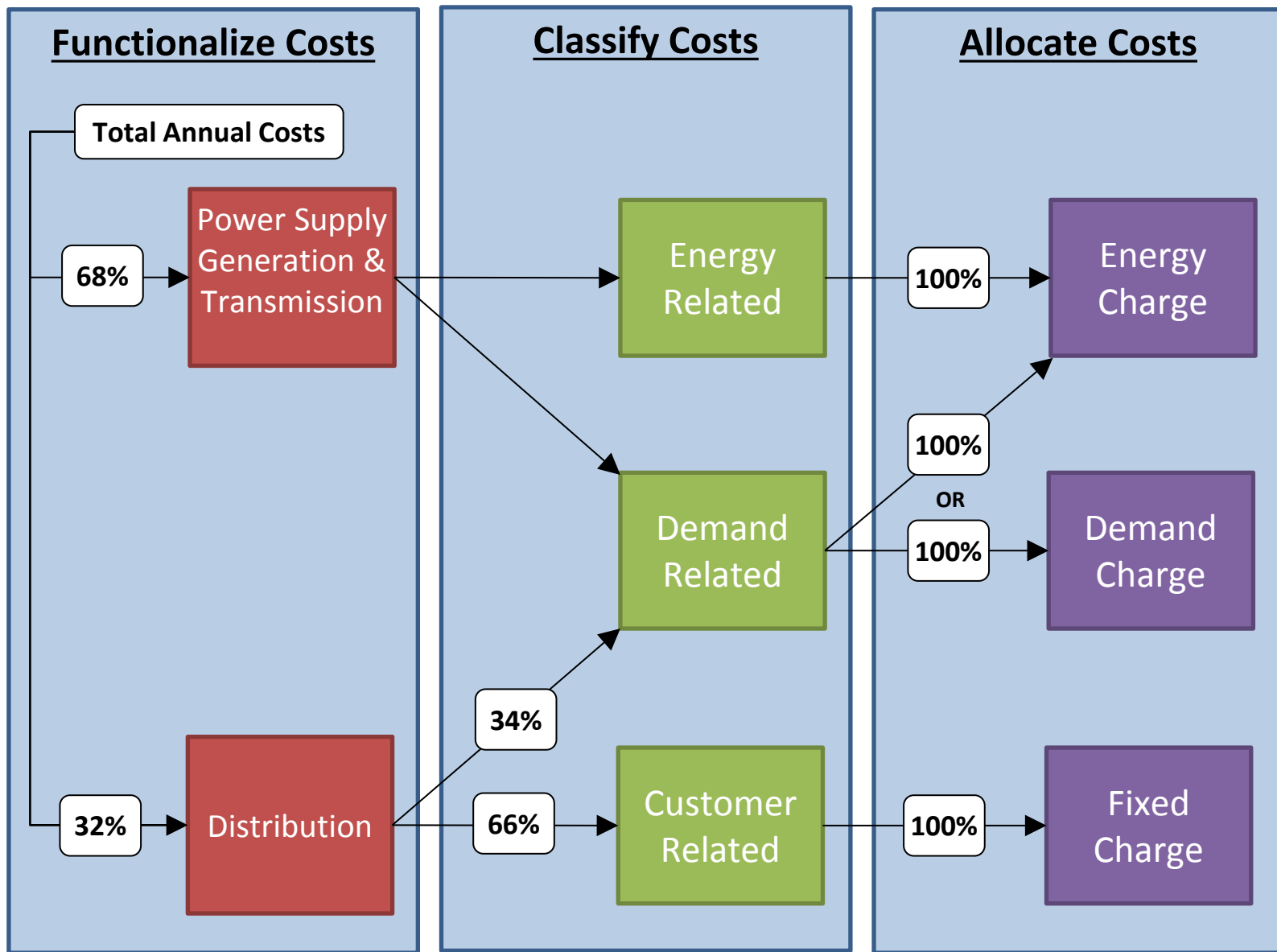


# DG Existing Rates and Policy





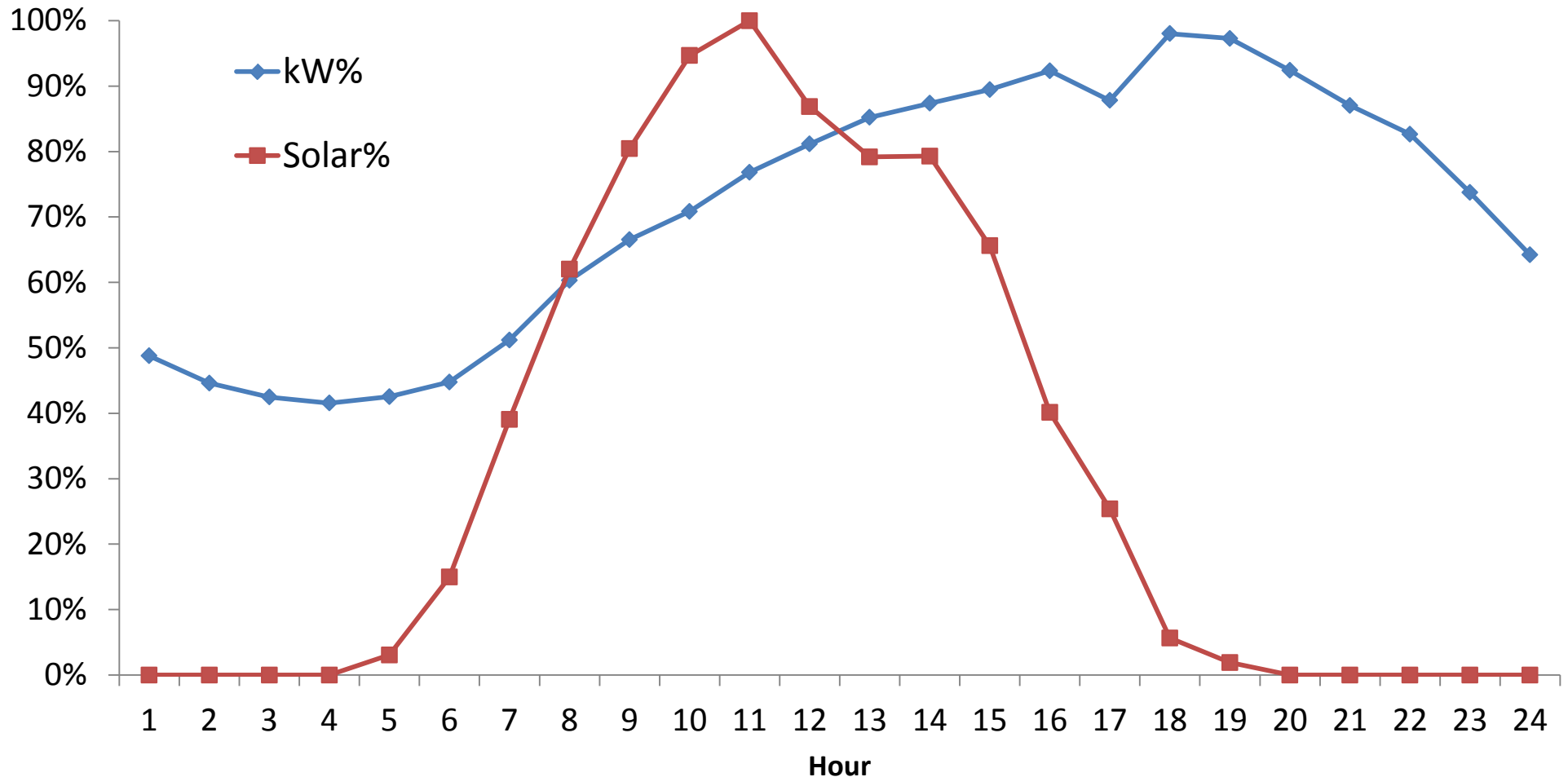
# Cost-of-Service (COS) Process



# Cost Allocation to Rate Classes

<b>Cost</b>	<b>Allocation to Rate Class</b>
Power Supply Energy	Energy Use
Power Supply Demand	Coincident peak with generation and transmission peak demand
Distribution Demand	Coincident peak with distribution peak demand
Customer	Customer Quantity Weighted to Cost of Single-Phase Rate Class to Other Rate Classes

# Power Supply - Allocation



Solar Capacity Contribution May Reduce Power Supply Demand Charge

# DG and Non-DG Billing Units

Description	Value
kWh Average/Month DG	500
kWh Average/Month Non-DG	1,000
kW Power Supply Non-DG	3.0
kW Power Supply DG	2.5
kW Peak Billing	9.0

# DG and Non-DG Account Costs

Cost Description DG	Units	Rate	Amount
Energy – \$/kWH Annual	6,000	\$0.040	\$240
Power Demand \$/kW – Annual	2.5	\$168	\$420
Distribution Customer – Annual	1	\$660	\$660
Distribution Demand – Annual	1	\$240	\$240
Total – Annual			\$1,560
Monthly Account Costs			\$130

Cost Description Non-DG	Units	Rate	Amount
Energy \$/kWH – Annual	12,000	\$0.040	\$480
Power Demand \$/kW – Annual	3.0	\$168	\$504
Distribution Customer – Annual	1	\$630	\$630
Distribution Demand – Annual	1	\$240	\$240
Total – Annual			\$1,854
Monthly Account Costs			\$155

Rates shown above are hypothetical for illustrative purposes only

# COS Rate DG and Non-DG

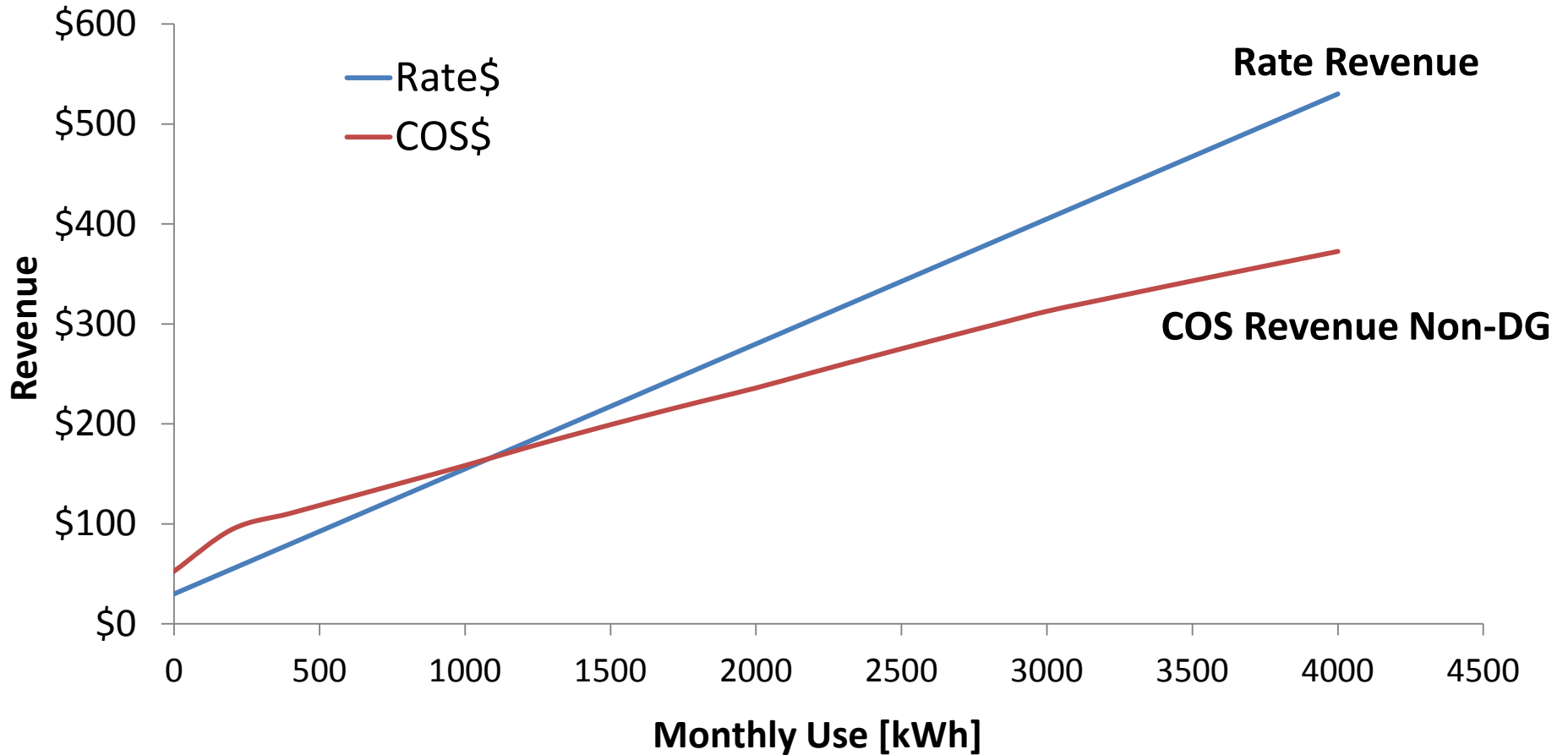
Cost Description	COS DG	COS Non-DG
Monthly Customer	\$55.00	\$52.50
Energy \$/kWh	\$0.040	\$0.040
Demand \$/kW/mo.	\$6.11	\$6.89

# Monthly Rate Revenue and COS

Cost Description	DG Account			Non-DG Account		
	Units	Rate	Monthly\$	Units	Rate	Monthly\$
Monthly	1	\$30	\$30	1	\$30	\$30
Energy	500	\$0.125	\$63	1,000	\$0.125	\$125
Total Monthly Bill			\$93			\$155
Monthly COS			\$130			\$155
Deficit/Month			\$37			\$0

Rate shown above is for illustrative purposes only

# Maintain Existing Rate Option





# Limit Net Metering Rate Option

Annual Use kWh	Maximum DG kW DC
10,000	8.2
14,000	11.4
20,000	16.3
25,000	20.4
48,900	39.9

Assumes capacity factor of 0.14

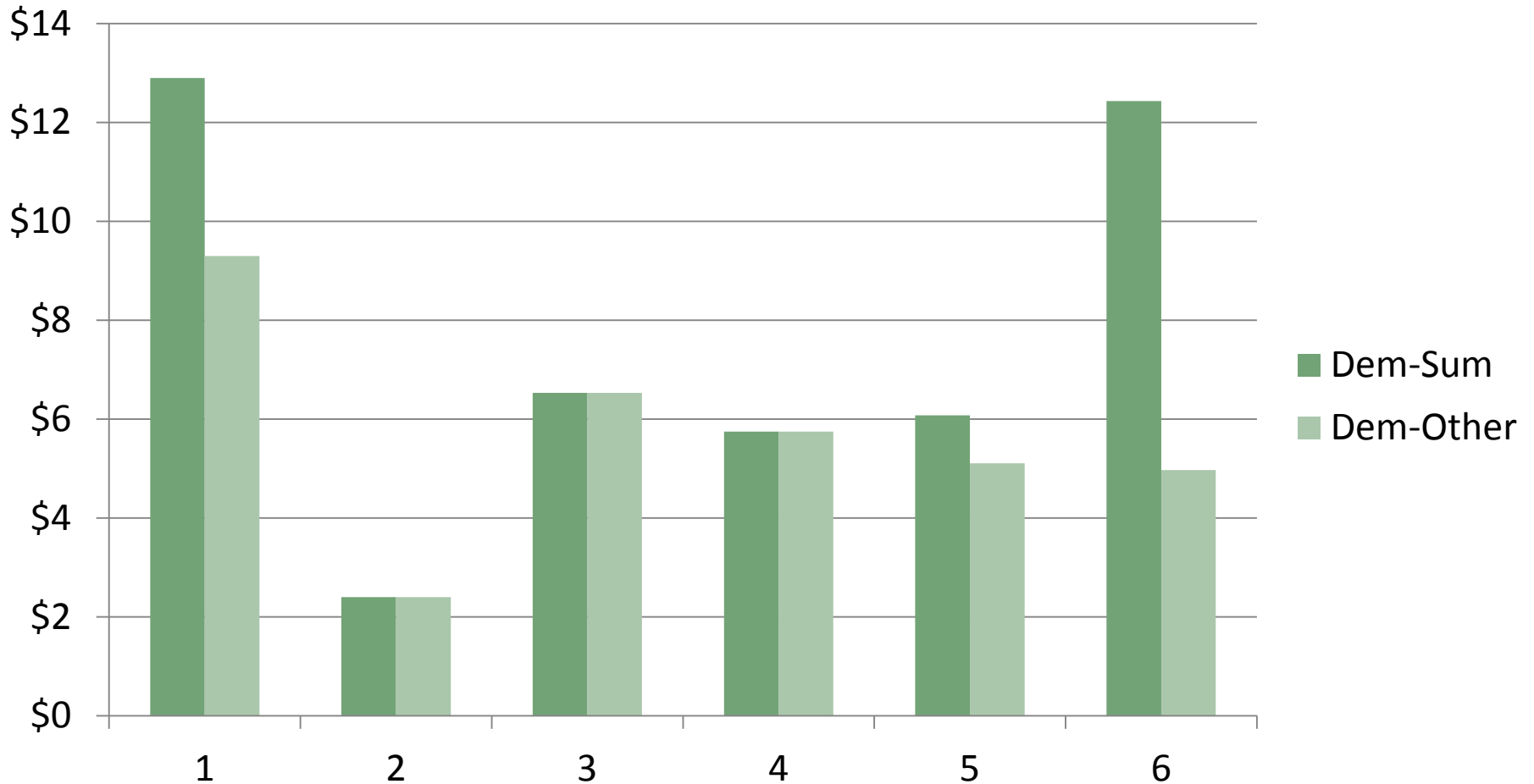
# Demand Rate Option

Description	Energy Rate	Demand Rate
kWh Use	12,000	12,000
kWh DG	6,000	6,000
kWh Net	6,000	6,000
kW Annual	108	108
Monthly	\$30	\$30
\$/kWh	\$0.125	\$0.064
\$/kW	\$0.00	\$7.00
Revenue Non-DG	\$1,860	\$1,884
Revenue DG	\$1,110	\$1,500
Reduced revenue	\$750	\$384

Example using hypothetical rates with annual amounts and 5 kW DG

# Demand Rate Monthly Rates

Monthly Demand Charge \$/kW



# Avoided Cost Rate Option

Description	Net Metering Rate	Avoided Cost Rate
kWh Annual Use	12,000	12,000
kWh generation	6,000	6,000
kWh self use 45%	2,700	2,700
kWh to grid 55%	3,300	3,300
kWh net meter	6,000	9,300
Revenue Non-DG	\$1,860	\$1,860
Revenue DG	\$1,110	\$1,523
Credit avoided cost	\$0	\$116
Net Bill	\$1,110	\$1,407
Reduced revenue	\$750	\$453

Example using hypothetical retail rate of \$30/month, \$0.125/kWh, avoided cost of \$0.035/kWh with annual amounts and 5 kW DG

# Increase Monthly Charge Option

- Increase all accounts and reduce energy charge
- Increase only for DG accounts

# Community Solar Rate Option



Member Purchases Panel and Receives Credit for Energy Produced  
Return of 3% to 6%/Year and 10 to 14 Year Payback

# Conclusion

- Changes to rates for equitable recovery of distribution and other fixed costs
- Metering review for demand rates
- Revised Rates Planned for 2016

# Questions?



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