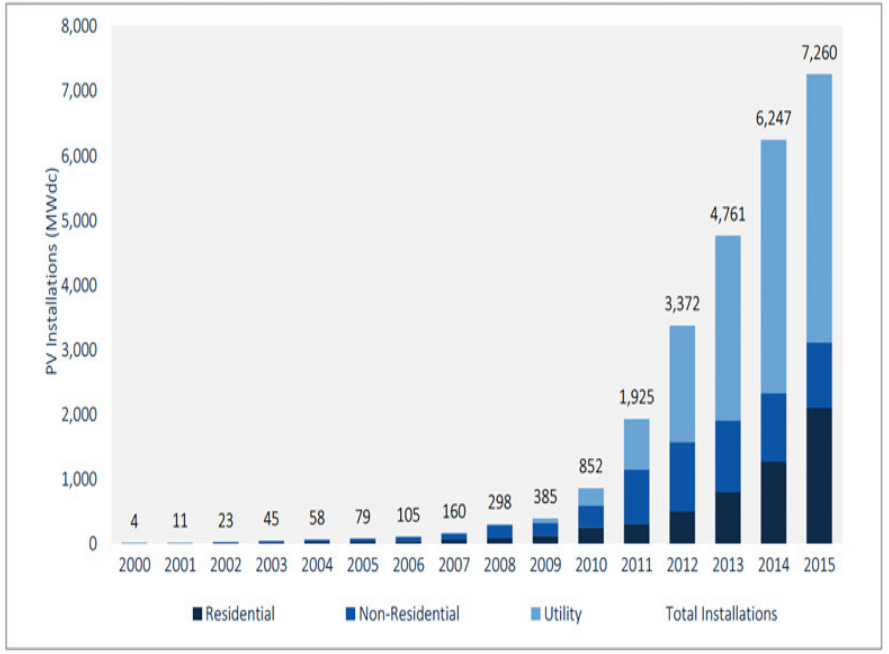

ISETA
IOWA SOLAR ENERGY TRADE ASSOCIATION

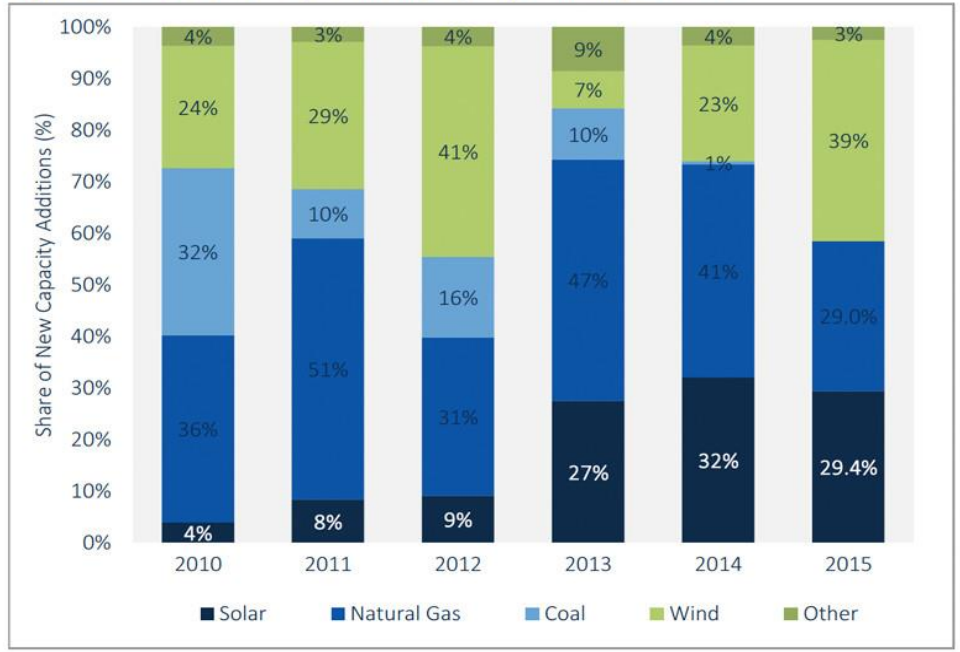
SOLAR IS HERE

Figure 1.1 Annual U.S. Solar PV Installations, 2000-2015



gtmresearch SEIA Solar Energy Industries Association

Figure 1.2 New U.S. Electricity Generating Capacity Additions, 2012-2015



Source: GTM Research (solar) FERC (all other technologies)

gtmresearch SEIA Solar Energy Industries Association

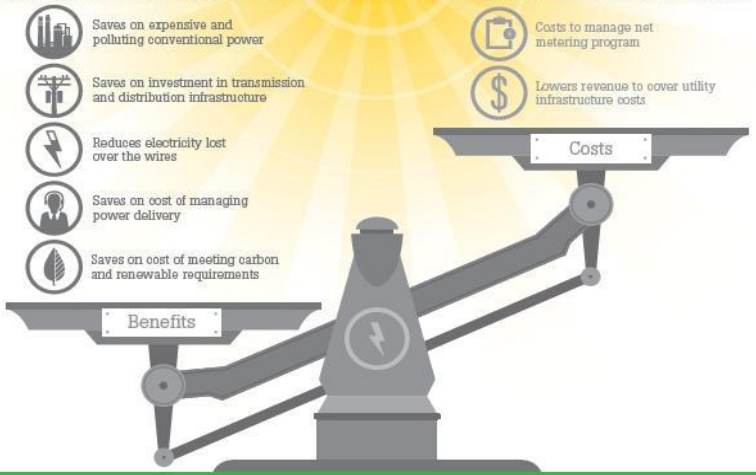
NET-METERING(NEM)_REVISITED

End the Utility Power Grab in California:
SOLAR CUSTOMERS DESERVE FAIR CREDIT WITH NET METERING

Like rollover minutes on a cell phone bill,

net metering gives renewable energy customers fair credit on their utility bills for the excess clean power they contribute back into the grid. This simple billing arrangement is one of the most important state policies for encouraging investment in solar – and it benefits solar and non-solar ratepayers alike!

Net metering grid benefits outweigh the costs by: $92.2 Million per year[1]



The utilities' tricky math doesn't add up.

Some utilities claim that net metering is not cost-effective for non-solar ratepayers, but time and again they use inaccurate numbers to make their case:

Utilities overstate net metering credits by as much as 40%.
Utilities assume that net metered customers are always credited at the highest rate tiers. Real-world data shows that many net metered customers are in lower tiers, so the utilities are losing much less revenue than they claim.

+

Utilities overstate the amount of solar power impacting the grid by as much as 80%.
Most solar output is used on-site without ever reaching the grid. Just like energy efficiency, solar used on-site places no burden on the utility system, and yet utilities are accounting for it as if it's a cost.

+

Utilities claim there are almost no cost-saving benefits of net metering.
Proven benefits are ignored. Individual customer investment in solar delivers high value power, creating a host of benefits to the grid including savings on conventional generation, transmission and distribution investments, line losses, and avoided environmental compliance costs. But the utilities' math counts only the first benefit, at most.

=

Overinflated cost claims

Utility cost claims are a red herring.

Other annual utility financials for perspective:

- Investor-owned utilities' annual electric revenues are $25 Billion
- Out-of-service San Onofre nuclear power plant cost SCE ratepayers $820 Million in 2012[2]
- PG&E's annual natural gas and coal power purchases from outside sources cost $1 Billion

0.37%
Net metered power is just 0.37% of total utilities' power demand

Net metering works for California.

43 Thousand jobs in the California solar industry[3]

$10 Billion in private investment

2/3 of home solar installations now occur in low and median income neighborhoods[4]

$2.5 Billion in energy bill savings for schools & other public agencies

Net metering is good for ratepayers, taxpayers, the economy and the environment.

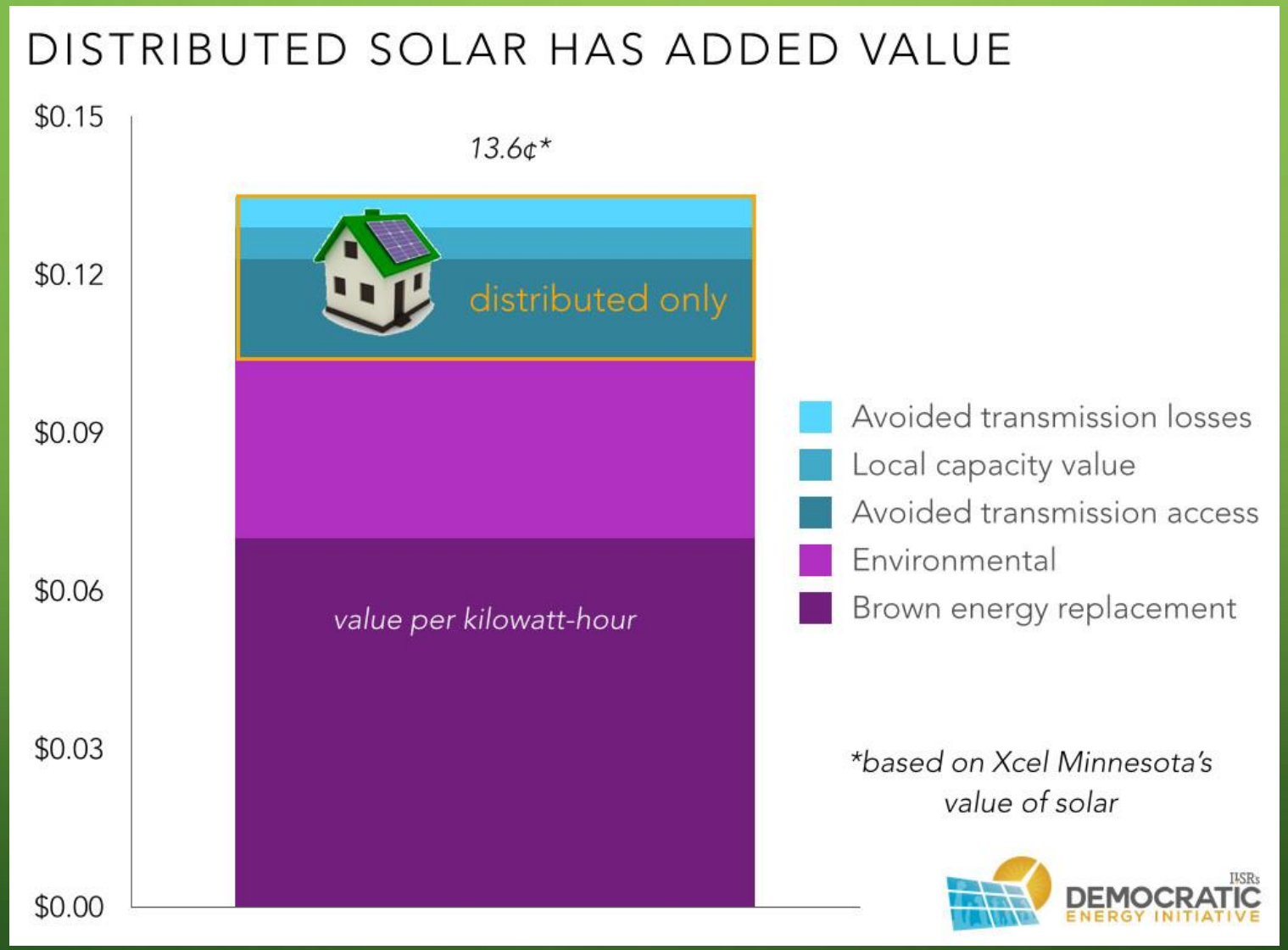
The interests of a few monopoly utilities should not outshine the rest of us.

Learn more at www.protectnetmetering.org

Prepared by: The Vote Solar Initiative.

References: [1]Annual net benefits to non-solar ratepayers once 5% cap is reached, from Evaluating the Benefits and Costs of Net Energy Metering in California, Crossborder Energy, January 2013 [2]San Onofre nuclear plant outage costs top $300 million, Los Angeles Times, November 2012 [3]SEIA CA Fact Sheet, January 2013 [4]CSI California Solar Statistics data

MINNESOTA_VALUE OF SOLAR



AUSTIN, TX_AUSTIN ENERGY SOLAR RATE STRUCTURE

- Austin Energy's residential solar rate has been designed to:
- Reflect the value of local solar generation
- Create equity between high and low consuming solar customers
- Reduce cost-shifting between solar and non-solar customers
- Recover Austin Energy's fixed costs
- Encourage solar customers to engage in efficiency and conservation

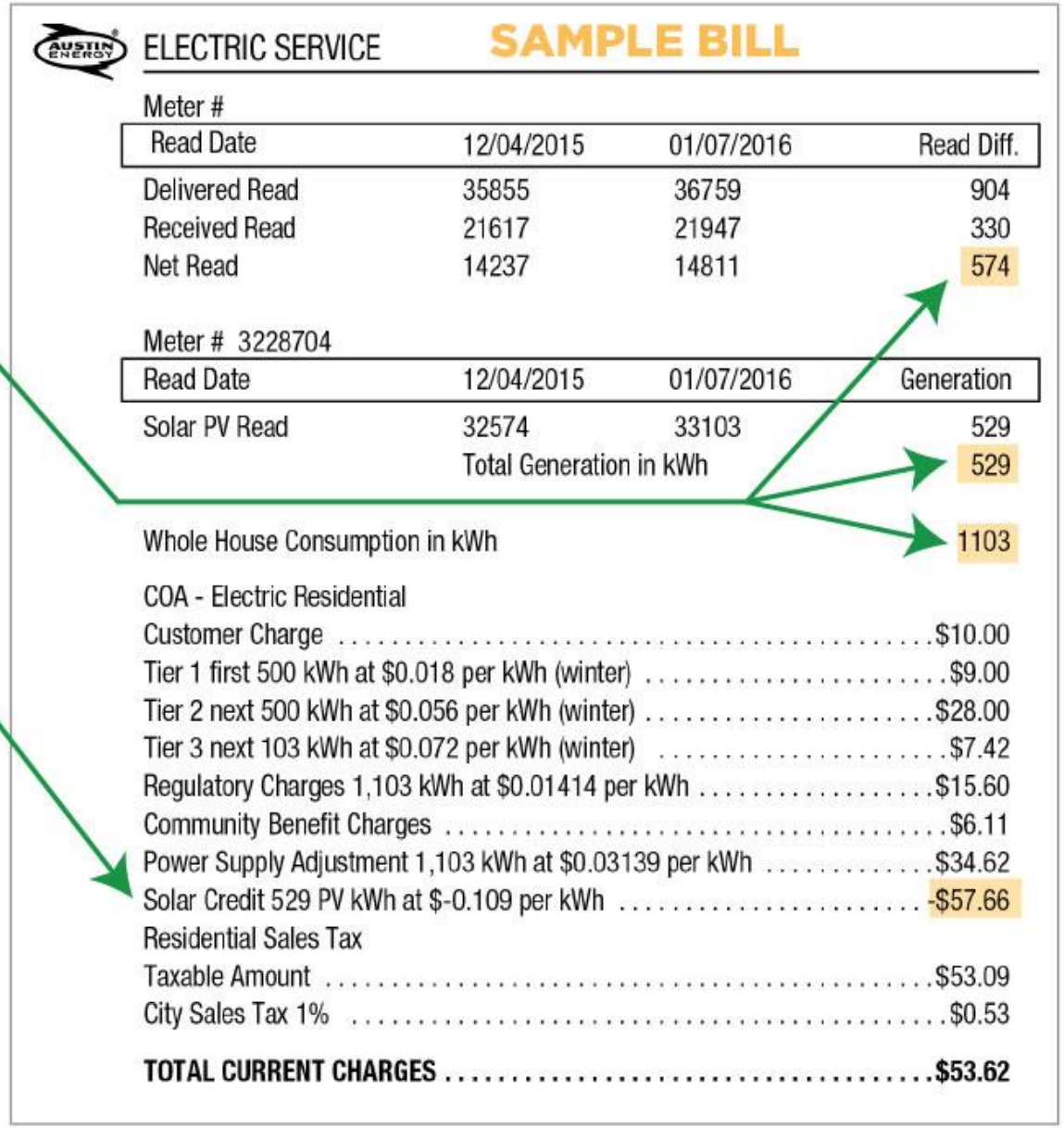
AUSTIN ENERGY SOLAR RATE REFLECTION

- Fuel Value Avoided cost of fuel to meet electric loads as well as transmission and distribution losses, based on the solar production profile. This is inferred from ERCOT market price data and future natural gas prices.
- Plant O&M Value Avoided costs associated with natural gas plant operations and maintenance by meeting peak load through renewable sources.
- Generation Capacity Value Avoided capital costs of generation by meeting peak load through renewable sources, inferred from ERCOT market price data.
- Transmission and Distribution Capacity Value Savings in transmission costs resulting from the reduction in the peak load by renewable sources.
- Environmental Compliance Value Avoided cost to comply with environmental regulations and local policy objectives.

The solar customer is billed on Whole House Consumption under the residential five-tiered rate schedule. Whole House Consumption is calculated by adding the net energy consumed from the grid to the PV production.

The solar customer is then credited for their PV production at the Value of Solar Rate.

If the total current charges result in a negative amount, a credit will roll forward to the next month's electric bill.



ELECTRIC SERVICE **SAMPLE BILL**

Meter #

Read Date	12/04/2015	01/07/2016	Read Diff.
Delivered Read	35855	36759	904
Received Read	21617	21947	330
Net Read	14237	14811	574

Meter # 3228704

Read Date	12/04/2015	01/07/2016	Generation
Solar PV Read	32574	33103	529
	Total Generation in kWh		529

Whole House Consumption in kWh 1103

COA - Electric Residential

Customer Charge	$10.00
Tier 1 first 500 kWh at $0.018 per kWh (winter)	$9.00
Tier 2 next 500 kWh at $0.056 per kWh (winter)	$28.00
Tier 3 next 103 kWh at $0.072 per kWh (winter)	$7.42
Regulatory Charges 1,103 kWh at $0.01414 per kWh	$15.60
Community Benefit Charges	$6.11
Power Supply Adjustment 1,103 kWh at $0.03139 per kWh	$34.62
Solar Credit 529 PV kWh at $-0.109 per kWh	-$57.66
Residential Sales Tax	
Taxable Amount	$53.09
City Sales Tax 1%	$0.53
TOTAL CURRENT CHARGES	**$53.62**

GEORGIA SOLAR PROGRAM STRUCTURE

Group	Capacity (MW)	Project Size/ Allocation*	Customer Sited**	Greenfield Sited
A	40	>1 MW - < 3 MW	Competitive Bidding	Competitive Bidding
	10	500 kW-1 MW	Competitive Bidding	Competitive Bidding
B	40	>100 kW-1 MW	Preference and Fixed Pricing	Ineligible
		>100 kW - ≤500 kW	Preference and Fixed Pricing	Remaining MWs Lottery Selection
C	10	< 100 kW	Fixed Pricing	Ineligible
Total	**100 MW**			

NEW YORK_LIPA SOLAR FIT PROGRAM

- **Clean Solar Initiative Projects**
- Long Island Power Authority Clean Solar Initiative (CSI) Feed-In Tariff (FIT) Projects.
- By resolution dated June 28, 2012, the Trustees established LIPA's Clean Solar Initiative Feed-In Tariff under SC-11 for the purchase of up to 50 MW of distributed solar PV generation renewable resources for a fixed price of $0.22 per KWh under a 20-year PPA ("FIT 1").
- To effectuate the FIT I, participants were required to enter into an interconnection agreement pursuant to LIPA's Smart Grid Small Generator Interconnection Procedures and execute a 20-year PPA, Under CSI FIT 1 the solar PV generators are required to sell to LIPA 100% of the output (energy, capacity and renewable energy certificates) and are not eligible for other LIPA incentive programs, such as LIPA's Solar Entrepreneur rebates or net metering.
- Applications for participation in the CSI FIT 1 were accepted starting July 16, 2012 with the rate of $0.22 per kWh of electricity delivered to LIPA's grid over a 20-year contract term subject to the PPA. FIT I was fully subscribed and projects commenced commercial operation during 2014.

FARMERS ELECTRIC COOPERATIVE

VALUE OF SOLAR
BUSINESS MODEL BENEFITS

- Separate meter
- Tax credits – Federal, State, Local (carbon tax)
- Environmental Attributes – trackable
- Settles Monthly
- Guaranteed Term (benefits both sides)
- Rate Control (Utility, IUB, Stakeholders)
- Trackable Data to support analysis and reliability
- Billing line item (generation can follow consumption)

SUPPORT DATA

RPGI PEAK TO SOLAR POWER GRAPH

DEMAND PEAK 75% WITHIN SOLAR WINDOW

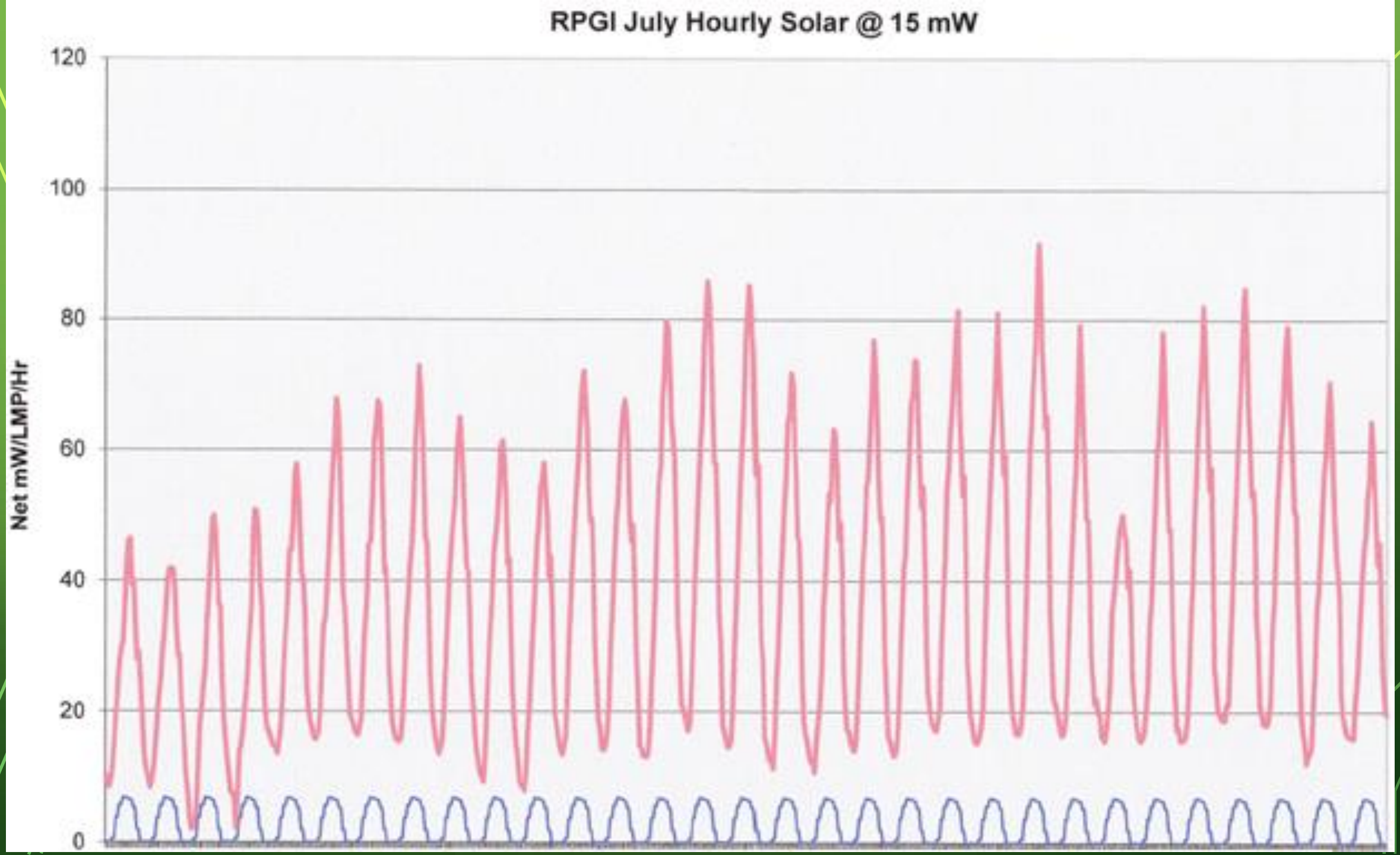
FEC "HYBRID INPUT TARIFF" -- VOS

FEC HIGHEST SOLAR PENETRATION IN STATE

- 2500 watts/customer (50 x IPL solar penetration)
- 20% of customers own solar
- Greater than 10% of kWhrs from solar
- Funded by savings not rate increases

HOW CAN WE ACCOUNT FOR THE VALUE IN A VALUE OF SOLAR TARIFF

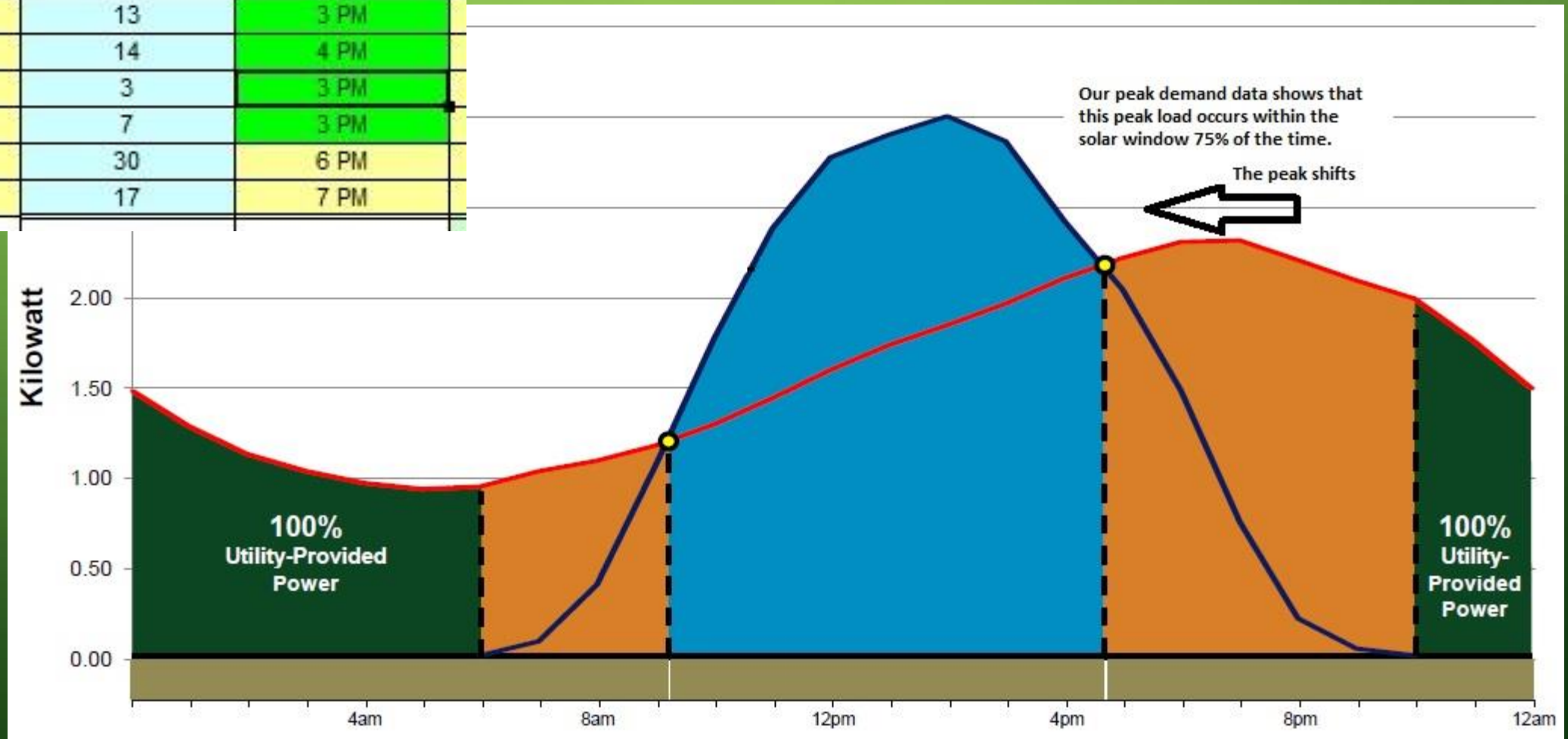
- AVOIDED COST
- ENVIRONMENTAL
- PERFORMANCE


RPGI July Hourly Solar @ 15 mW
Net mW/LMP/Hr
120
100
80
60
40
20
0

MONTHLY PEAK IS IN SOLAR WINDOW 75% OF TIME FOR RPGI

RPGI Wholesale power bills

day	date	time
Wed	7	7 PM
Mon	23	9 AM
Thu	5	9 AM
Wed	8	11 AM
Wed	27	4 PM
Wed	10	5 PM
Mon	13	3 PM
Fri	14	4 PM
Thu	3	3 PM
Wed	7	3 PM
Mon	30	6 PM
Thu	17	7 PM



SOLAR FARM ANALYSIS -- .0665 + .015 PTC = .0815/KWH

The minimum Value of Solar at FEC

12 Month Solar Farm Analysis

	Solar Farm kWhrs		TOD	Plant Rate / Plant Pk	800 / 600	Avoided demand	Avoided kwhr	Avoided total
Nov-14	54160			0.00%				
Dec-14	42000			0.00%				
Jan-15	50000			0.00%				
Feb-15	55000		9 AM	30.00%	180	$ 1,857.60	$ 2,095.50	$ 3,953.10
Mar-15	108500		9 AM	40.00%	240	$ 2,476.80	$ 4,133.85	$ 6,610.65
Apr-15	117500		11 AM	20.00%	120	$ 1,238.40	$ 4,476.75	$ 5,715.15
May-15	94000		4 PM	75.00%	450	$ 4,644.00	$ 3,581.40	$ 8,225.40
Jun-15	104500		5 PM	50.00%	300	$ 3,096.00	$ 3,981.45	$ 7,077.45
Jul-15	101000		3 PM	90.00%	540	$ 5,572.80	$ 3,848.10	$ 9,420.90
Aug-15	125500		4 PM	90.00%	540	$ 5,572.80	$ 4,781.55	$ 10,354.35
Sep-15	113000		3 PM	90.00%	540	$ 5,572.80	$ 4,305.30	$ 9,878.10
Oct-15	93000		3 PM	90.00%	540	$ 5,572.80	$ 3,543.30	$ 9,116.10
	1058160		Power demand[D]	kwhr [E]				$ 70,351.20
			Bill $	10.32	0.0381	AVOIDED ENERGY + DEMAND		$ 0.0665
			Power cost AVG [D+E]		$ 0.0548			

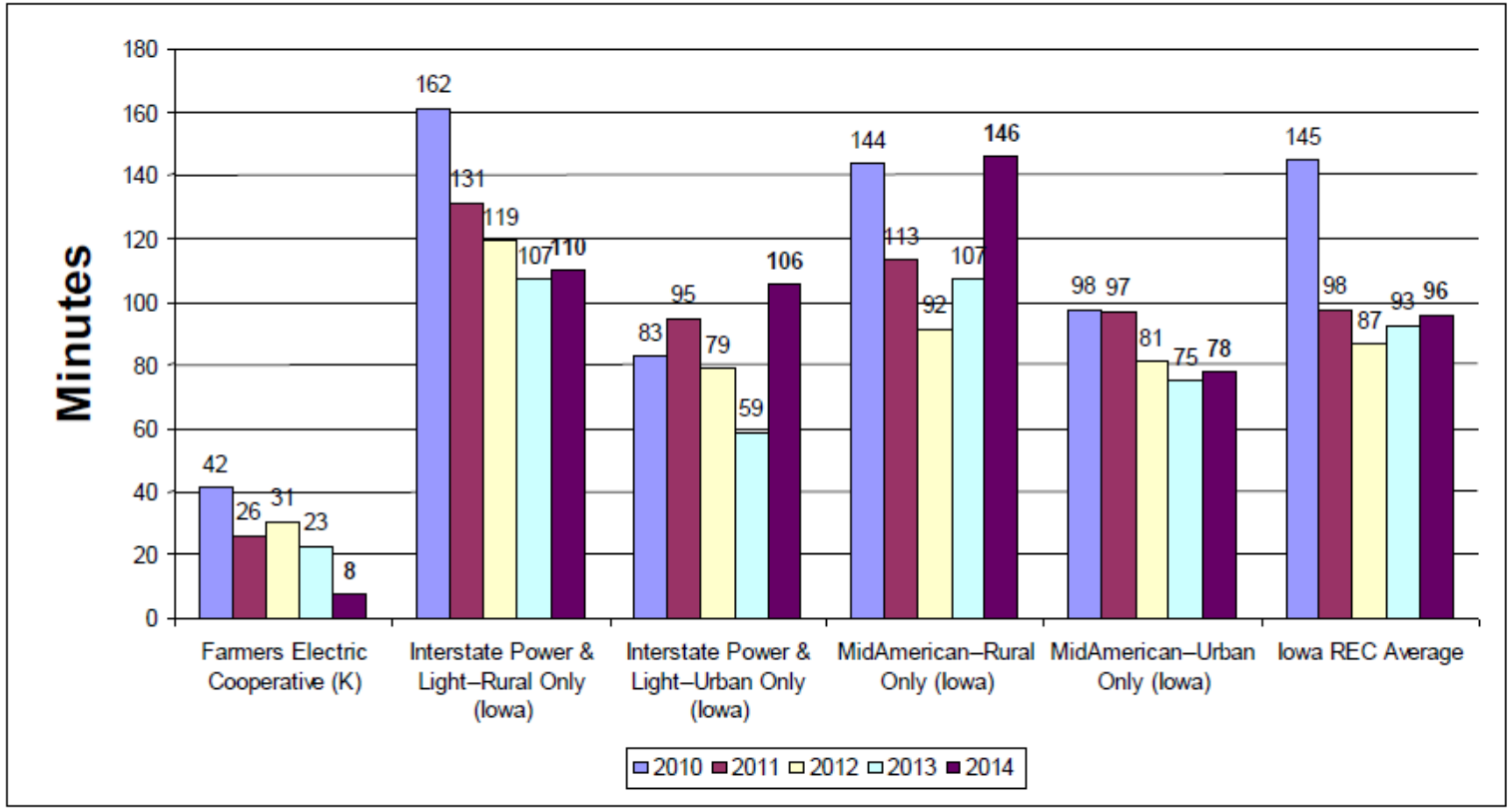
MICRO GRID RELIABILITY + WHOLESALE MARKET

Farmers Electric Cooperative (K)

System Average Interruption Duration Index (SAIDI)
Average Minutes of Interruptions per Consumer

SAIDI is computed as follows: $\frac{\text{Sum of All Customer Interruption Durations}}{\text{Total Number of Customers Served}}$

Excludes Major Event



Note: SAIDI is the index that has been computed for several years for the RUS Form 7.

- MISO Market Participants
- 45% Power Real-time
  - High % Wind
- 6 MW Gensets (MISO)
  - Capacity Credits

- ← HIGH RELIABILITY

- High Performance
  - Loss losses
  - High load factor

RATE DESIGN PRINCIPLES

- Prices ideally should be forward-looking and reflect long-run marginal costs;
- Prices should concentrate on the energy or usage sensitive components of service if they are to encourage the consideration of economic alternatives to grid-supplied resources--e.g. energy efficiency and customer-sited energy production;
- Rate design must be simple enough for the customer to understand;
- If utility system costs vary by season or time of day, or if a significant portion of utility investment is driven primarily by load in particular months or particular hours of the day, then efficient pricing should reflect these cost drivers; and
- Environmental externalities, not paid by utilities, tend to justify higher-than-average prices for incremental consumption, because it is at the margin where changes in behavior and usage patterns occur.

Q & A

Thank you