Value of Solar Update

Council Committee for Emerging Technology and Telecommunications

January 15, 2014

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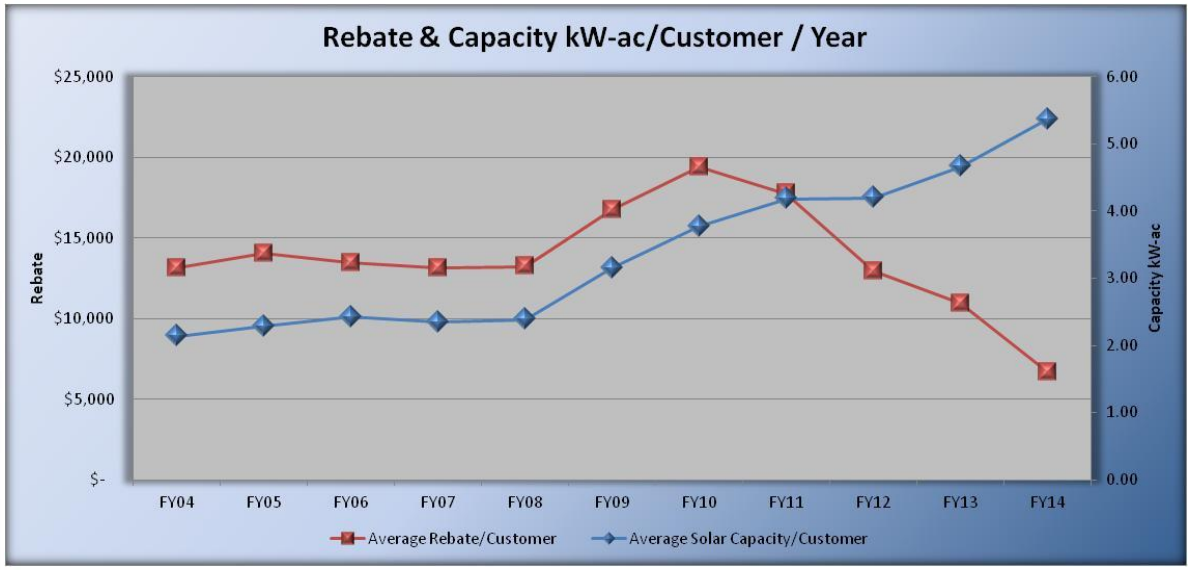
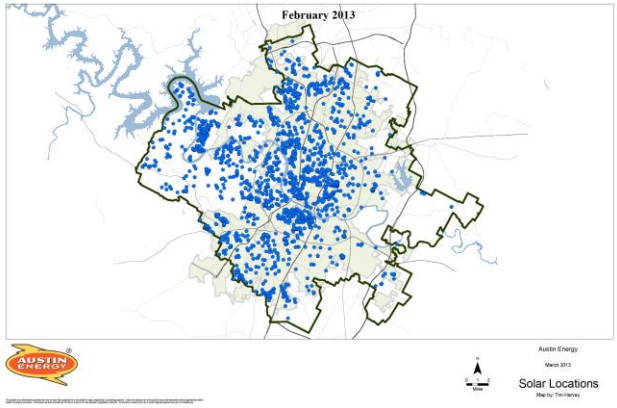
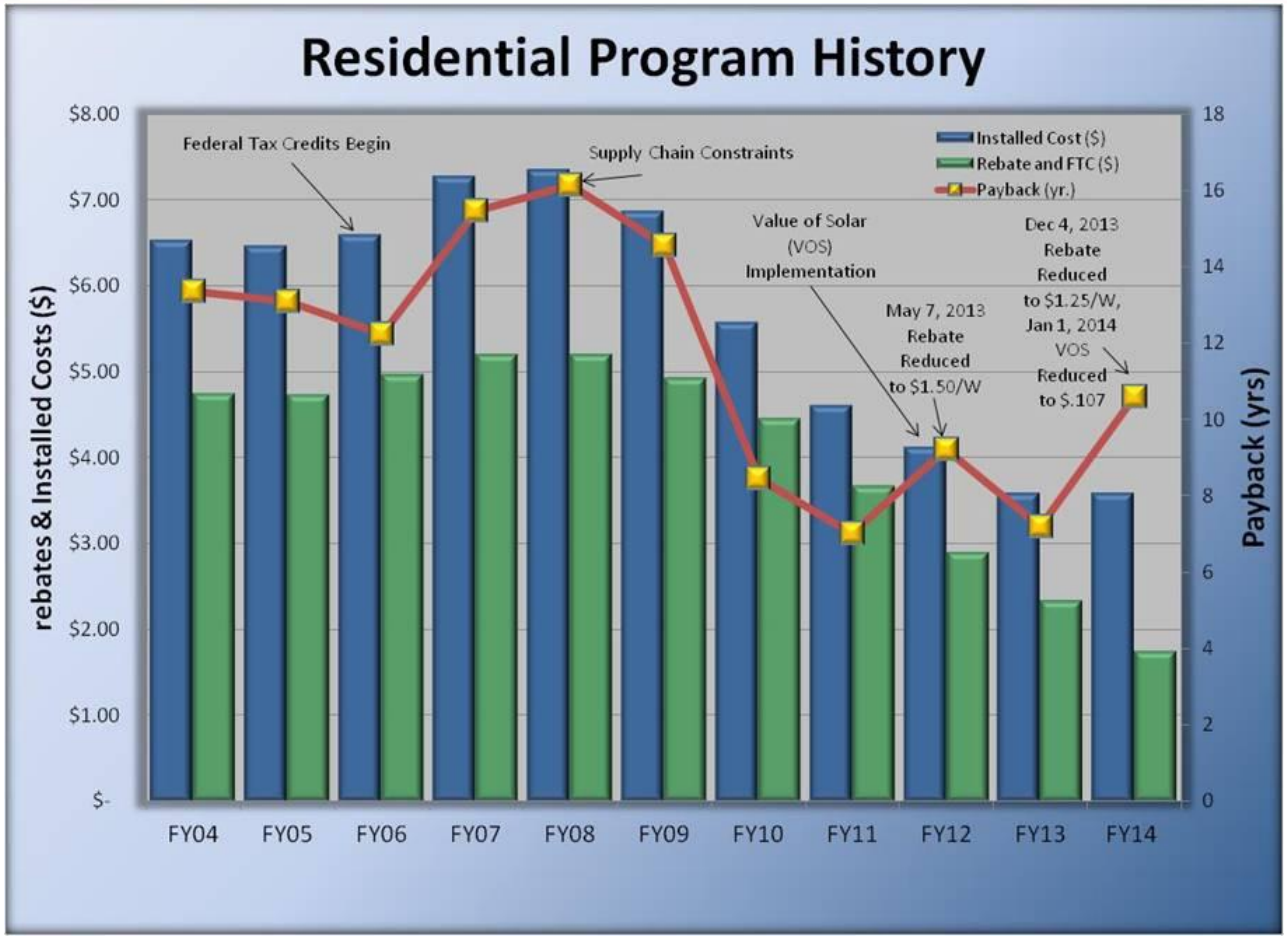
AE Solar Customers

- The average “whole house” consumption for an Austin Energy solar customer is 16,900 kWh per year (average AE customer is 12,000 kWh annually)
- The average AE solar array is approx. 4 kW-ac
- Average annual PV system production is 6,182 kWh
- Average upfront incentive is $13,600 (see graph) but trending downward while system size is trending up





Installed Costs, Rebates and Payback



- Payback with $1.25/watt rebate and VoS @ 10.7¢ is ~10 years
- Average payback over program history is ~12 years

VoS Overview – Rate and Sweep

- AE developed the Residential Solar rider as alternative to net metering
- VoS reflects current market conditions and is reset annually

#1

'The Value of Solar Factor shall initially be $0.128 per kWh and shall be administratively adjusted annually, beginning with each year's January billing month, based upon the marginal cost of displaced energy, avoided capital costs, line loss savings and environmental benefits.'

- **Staff believes formula valid, will review enhancements**

#2

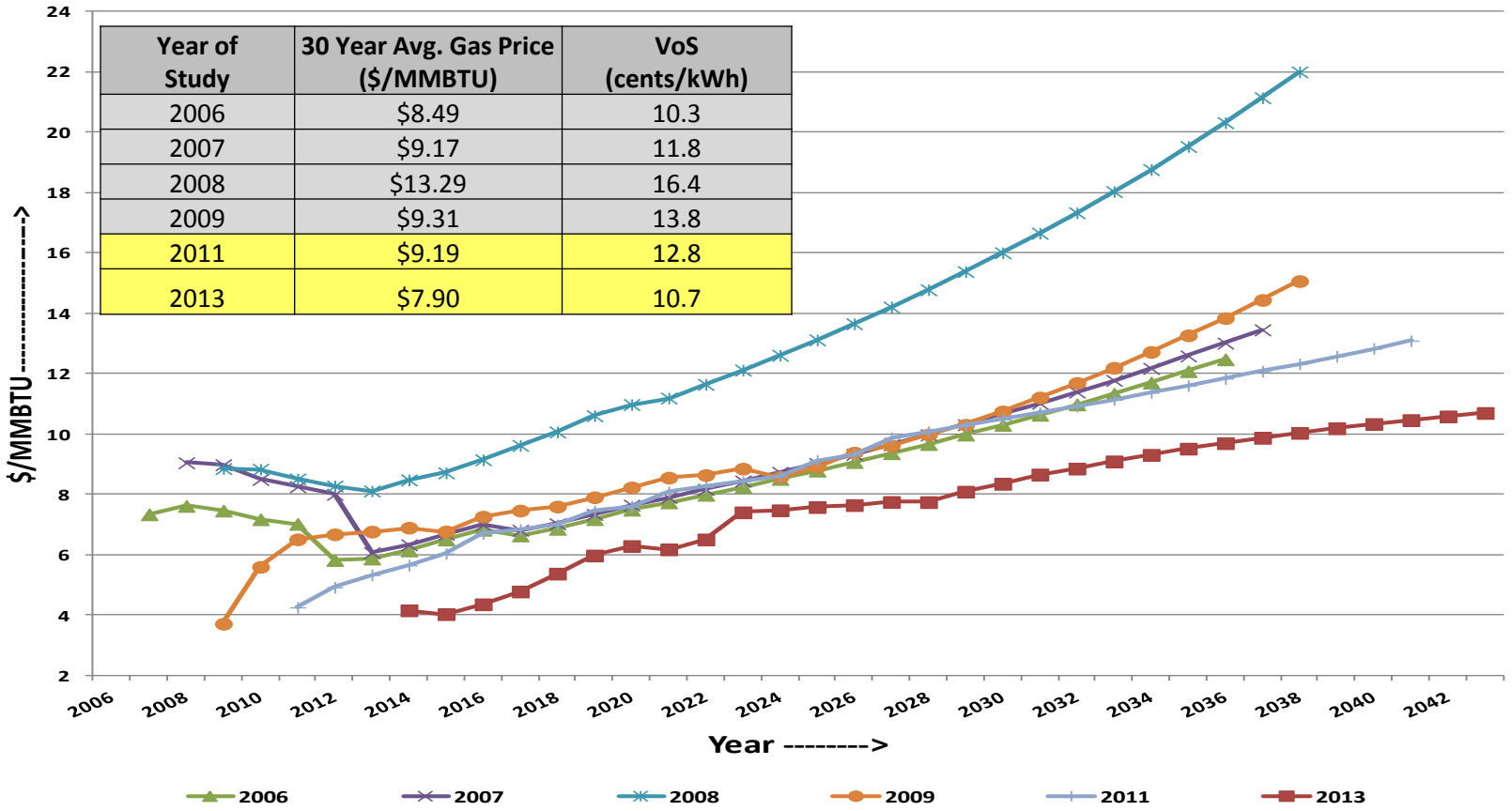
… the customer's carry-over credit, if any, shall be reset to zero in the first billing month of each calendar year.'

- **Staff believes this should be changed**

Issue #1: Solar Value

- The VoS and the future price of natural gas trend with one another
- Other components also influence the result

Year of Study	30 Year Avg. Gas Price ($/MMBTU)	VoS (cents/kWh)
2006	$8.49	10.3
2007	$9.17	11.8
2008	$13.29	16.4
2009	$9.31	13.8
2011	$9.19	12.8
2013	$7.90	10.7

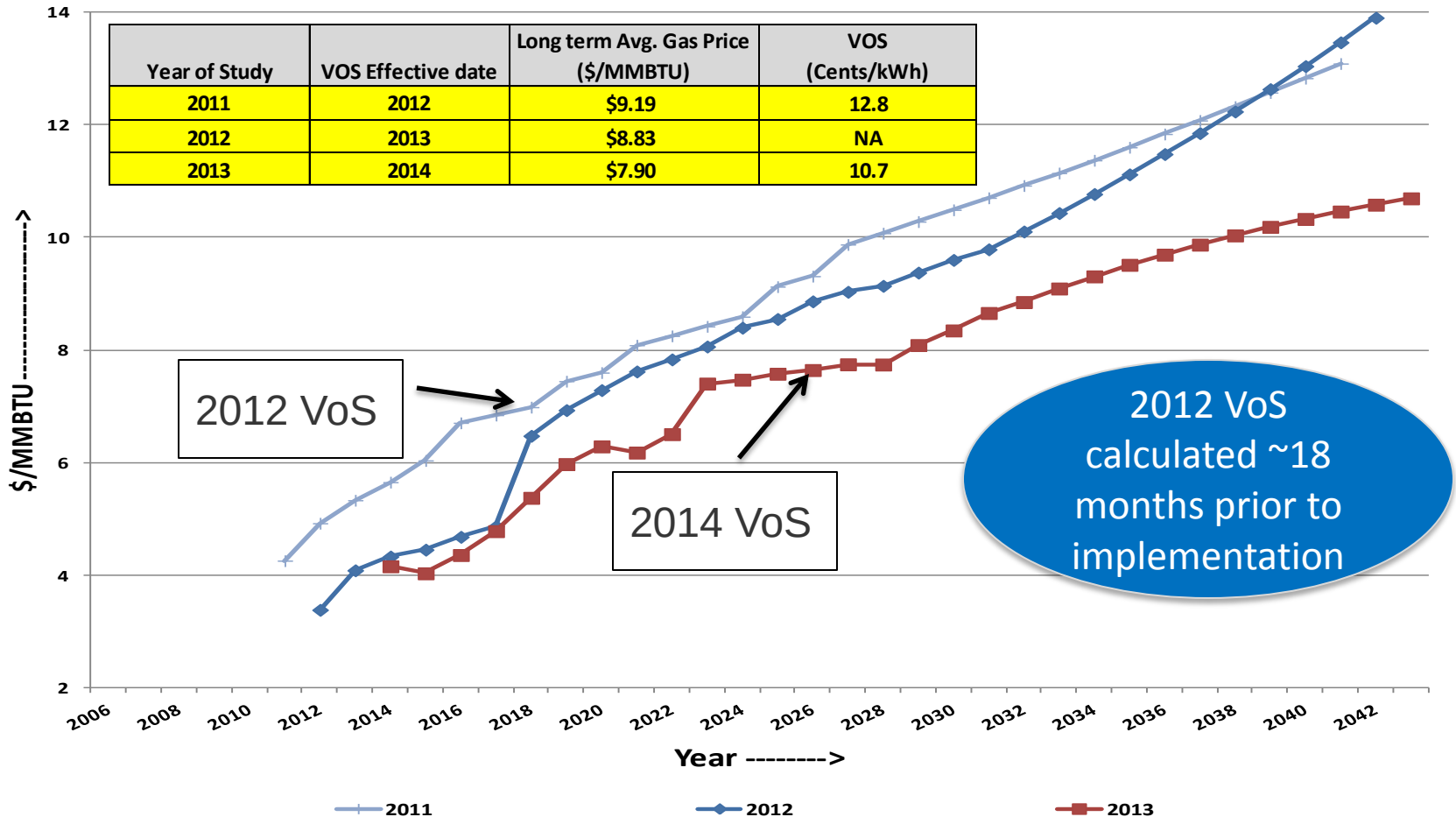


*Based on forward price curves from Wood Mackenzie and NYMEX

Future Natural Gas Prices and the VoS

- The VoS and the future price of natural gas generally trend with one another
- Other components also influence the result

Year of Study	VOS Effective date	Long term Avg. Gas Price ($/MMBTU)	VOS (Cents/kWh)
2011	2012	$9.19	12.8
2012	2013	$8.83	NA
2013	2014	$7.90	10.7



2013 VoS Review

7/23	Contract with CPR/Dr. Tom Hoff – performed original study
9/26	Hoff presentation to AE staff on preliminary results
10/1	VoS update included in CC&B rate work to be completed by Jan. 1
10/16	AE Meeting with LSAC – Discussed VoS results being finalized, would be presented to Joint EUC/RMC meeting
10/17	Solar contractor meeting - AE informed contractors VoS would be lower, and would be presented at the joint EUC/RMC meeting
10/21	Hoff presentation of results to AE Executive Team
10/21	Hoff presentation on VoS to joint EUC/RMC meeting
10/22	G.M. memo to Council and Commissions announcing VoS change
11/21	New VoS announced to contractors at monthly meeting
12/6	Press Release & January PowerPlus article
12/6	Letters to Customers
12/13	Executive summary from Hoff completed and distributed to Council and Commissions
12/16	Presentation to EUC
12/18	COA Legal memo to Council re: conformance to legal requirements

Value of Solar Update

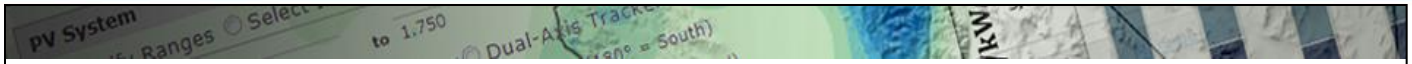
Excerpted from CPR Summary as of October 16, 2013

Objective

- Calculate long-term value of solar to Austin Energy
- This information will be used by Austin Energy as input for the basis of a rate offered to customers
- Rebates are not included in the analysis
- Societal benefits are not included in the analysis

Value of Solar Update

Excerpted from CPR Summary as of October 16, 2013



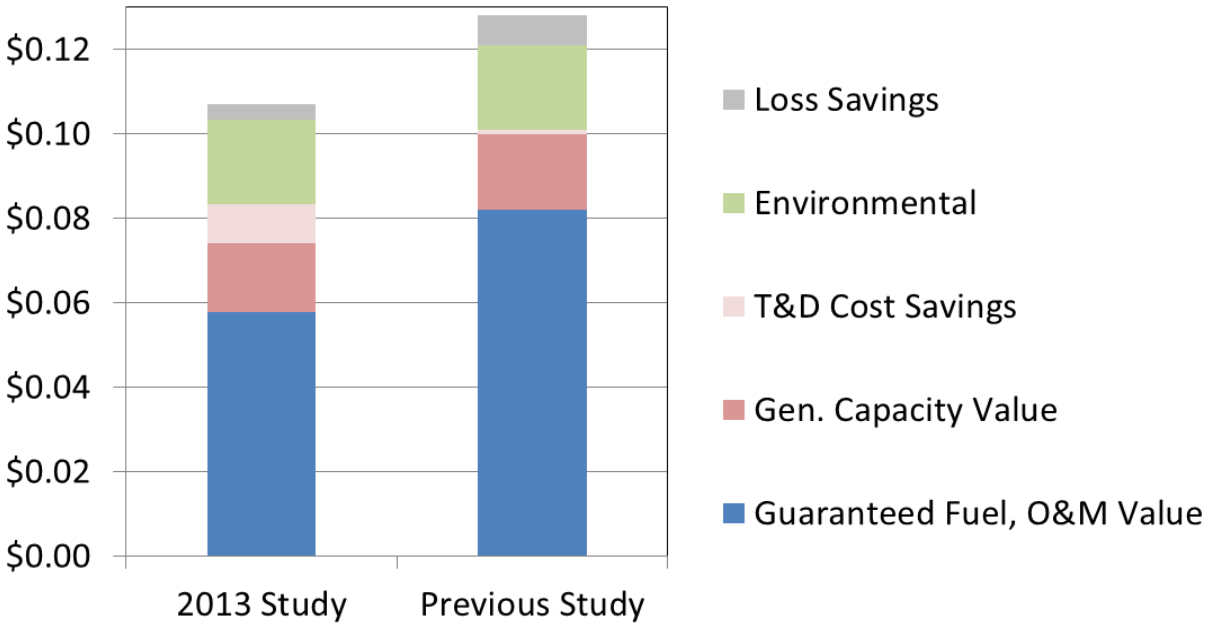
Value of Solar Components

Value Component	Basis
Guaranteed Fuel Value	Cost of fuel to meet electric loads and T&D losses inferred from nodal price data & guaranteed future NG prices
Plant O&M Value	Costs associated with operations and maintenance
Generation Capacity Value	Capital cost of generation to meet peak load inferred from nodal price data
Avoided T&D Capacity Cost	Cost of money savings resulting from deferring T&D capacity additions.
Avoided Environmental Compliance Cost	Cost to comply with environmental regulations and policy objectives.

Value of Solar Update

Excerpted from CPR Summary as of October 16, 2013

How Do Results Compare to Previous Study?



Prepared by Clean Power Research for Austin Energy

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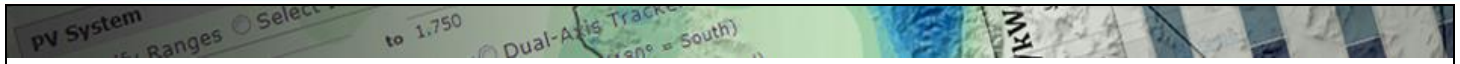


Why Have Results Changed?

- Natural gas prices have declined
- Assumed system life aligned to warranty period (25 vs. 30 years)
- Loss savings are slightly lower
- Transmission savings results have increased
- Methodology has been refined for ERCOT market

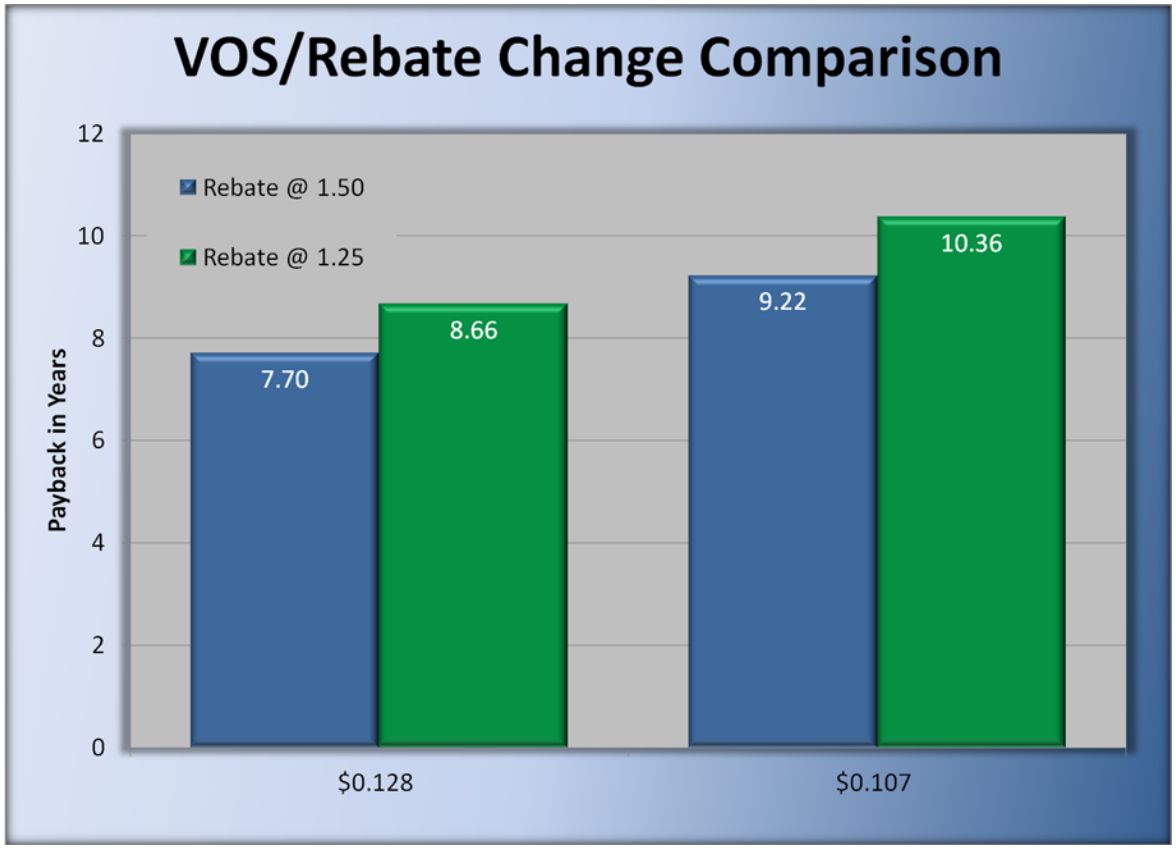
VoS Methodology – Avoided Cost Model

- Methodology has remained consistent
  - PV fleet data from AE's actual fleet rather than modeled representation
  - Refinements to reflect current nodal market structure
  - *"Energy Value"* renamed "Guaranteed Fuel Value" because this clarified fact that it includes protection from fuel price uncertainty
  - Increased transmission savings
  - Reduced discount rate to account for changed in interest rates
  - Assumed system life changed from 30 to 25 years
    - 20 - 25 yr panel warranty, 10 yr inverter warranty – industry standard
  - Retained 2006 value for environmental (did not use REC values)

"Several methodological advancements were made" - Dr. Tom Hoff

Impact on Payback

- Payback a function of VoS, Rebates, FTC
- Payback for new AE solar customers impacted similarly by change in rebate and VoS
- Change in VoS results in average customer receiving $130 less per year



VoS Benefits vs. Net Metering

- Austin Energy charges for full cost of service
  - Solar residential customer subject to same billing structure for consumption and applicable charges and adders as other residential customers
  - Solar customer can easily assess their total energy consumption
  - Five tier rate encourages energy efficiency

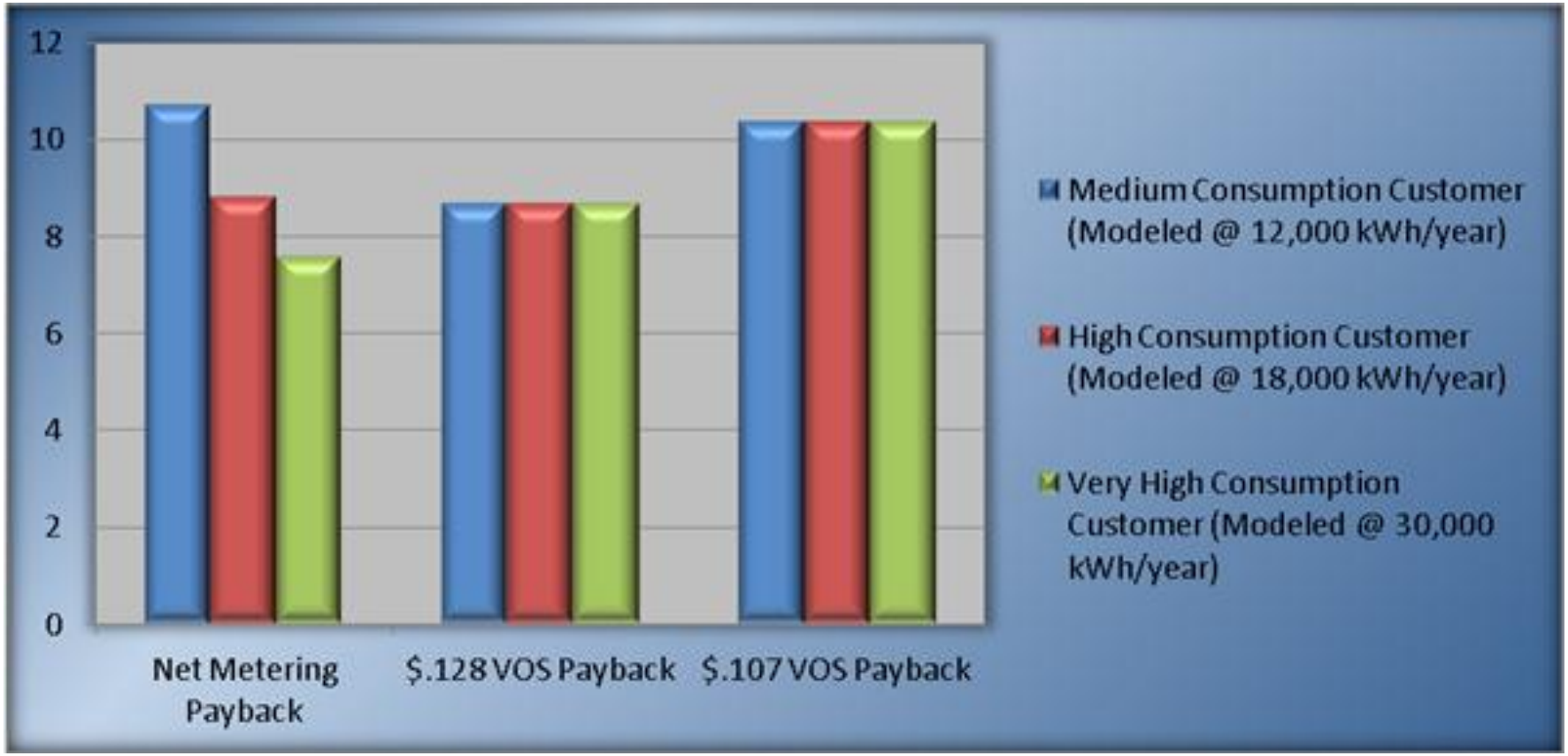
- Customer compensation tied to objective “Value of Solar” formula
  - Solar customer is compensated for energy production based on algorithm that is adjusted yearly as market values change
  - Solar energy production value does not decrease if customer saves energy
  - Low and high energy users compensated for solar energy production the same

Net Metering In a Tiered Rate Structure

Under net metering:

- Customers with higher consumption are compensated at a higher value per kWh than customers in lower tiers
- Customers with lower levels of consumption are compensated at a level below the value of the energy to the system
- Customers with higher levels of consumption are compensated at a level above the value of the energy to the system
- The utility under-recovers the cost of service, having to spread that cost across all customer
- Under a tiered rate structure, the signal sent to customers is that production offsetting higher tiers of consumption is more valuable to the utility

Customer Payback- VoS and Net Metering



Payback is shorter for high consumption customers under net energy metering than VoS at 10.7¢, payback is longer for “average” customers

*Projected net metering payback for customers inside City of Austin under current retail rate

Issue #2: Credit Carryover
Potential Tax Implications of VoS

Payments from utility to a customer for electric output could be construed as taxable income under the federal tax code

- IRS : a “non-refundable credit” is a credit that can reduce or eliminate liability but cannot result in a net gain to the taxpayer
- AE’s VoS designed so benefit to customer is a nonrefundable credit.
  - Limit VOS “payment” to the customer to a credit against the customer’s bill, and
  - Ensure credit never exceeds 100% of the customer’s billed consumption
- Any utility program that appears to generate net financial gain to the customer increases possibility that the customer could lose benefit of the 30% federal tax credit or be construed as taxable gross income

Impact of VoS Credit Sweep

Approx. 15% of solar customers had excess credits

- Total # of solar customers- 2,587
- Customers with balance swept- 391
- Total swept ~ $67,000, deposit to CAP
- Average amount swept $170

FY14 Solar Program Review

- FY13 excess credits applied to Customer Assistance Program
- Amend rider to allow for non-refundable rollover
- Develop multi-year analysis of requirements to achieve goal(s)
- Provide information to customers to assist in proper system sizing
- Consider revising VoS & program caps to ensure incentive program aligns with Residential Solar Rider
- Provide Customer more surety on return on investment – e.g. possible floor on VoS, fixed term of 5-10 years
- VoS to be included in budget review process
- Augment with other solar program enhancements
  - Community solar- RFP this January
  - Solar leasing?
  - Solar tariff?

Questions?