

# Electric Vehicles – Making Net Metering Sustainable

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# Quick Review: What is “Net Metering”?

- Customer’s meter “spins backwards” during the day (from solar panels or other renewable source)
- Meter “spins forward” at night
- Result = “net” electrical kWh consumption from grid is reduced or eliminated (i.e. customer stops paying utility for electrical energy)



# Why is Net Metering Not Sustainable?

- Customer energy sales are lost
- Fewer kWh sales to spread general rate expenses over
- Remaining customers shoulder the burden of general rate expenses, creates upward rate pressure (not good)



# What is “Sustainable Net Metering”?

- Coupling electric vehicles with rooftop solar, net metering becomes sustainable.
- **New load** from electric vehicles at night keeps utility whole.
- Win-Win: utility doesn't lose revenue, customer goes green.



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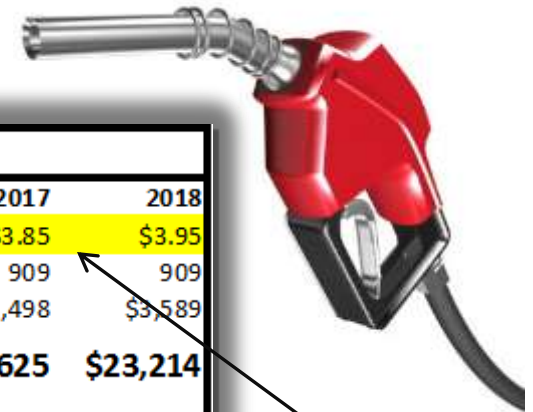


Net Metered PV Generation + EV Charging at Night = Good for Everyone

# Why would I be interested in this idea?

Ask Yourself: “Self, how much are you going to spend at the pump in six years?”

| Price of Gas                  |                |                |                |                 |                 |                 |                 |
|-------------------------------|----------------|----------------|----------------|-----------------|-----------------|-----------------|-----------------|
|                               | 2012           | 2013           | 2014           | 2015            | 2016            | 2017            | 2018            |
| Price                         | \$3.35         | \$3.45         | \$3.55         | \$3.65          | \$3.75          | \$3.85          | \$3.95          |
| Gallons Per Year              | 909            | 909            | 909            | 909             | 909             | 909             | 909             |
| Cost Per Year                 | \$3,044        | \$3,135        | \$3,225        | \$3,316         | \$3,407         | \$3,498         | \$3,589         |
| <b>Cumulative Cost of Gas</b> | <b>\$3,044</b> | <b>\$6,178</b> | <b>\$9,404</b> | <b>\$12,720</b> | <b>\$16,127</b> | <b>\$19,625</b> | <b>\$23,214</b> |
|                               |                |                | Miles/yr       | Gallons         |                 |                 |                 |
| Vehicle #1                    | 28 MPG         |                | 12000          | 429             |                 |                 |                 |
| Vehicle #2                    | 25 MPG         |                | 12000          | 480             |                 |                 |                 |
| Total Gallons Per Year        |                |                |                | 909             |                 |                 |                 |



\$0.58 road tax removed from estimated gas price

~\$20,000 in 6 years (\$23,000 including road taxes)

# What might a person do with \$20,000?



**A 5kW system will fuel two EVs for 12,000 miles each per year.**

**Three things to consider:**

- 1) This system can cost \$17,500 installed (\$25k without tax credit).**
- 2) After ~6 years, pay-off achieved (not pay-back).**
- 3) Panels should last 30 years.**

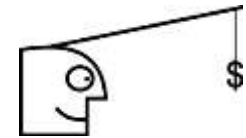
# Sustainable Net Metering Concept

- Utility partners with solar installers & charging station vendors to provide low cost systems
- 2.5 kW PV system for one car, 5.0 kW system for two cars
- Fuels electric cars for ~12,000 miles per year
- By not paying for gasoline, customer's solar system pays for itself in six years or less – then provides 25+ years of free/very low cost transportation energy



# How Can We Lower Installed Cost of Solar?

- High volume (through utility program) lowers solar installed costs to  $< \$6.00/w$  (possible today)
- Utility offers a small incentive ( $\$1/w$ ) to lower solar installed cost to  $< \$5/w$
- High volume lowers charging station installed costs
- Utility offers incentive towards charging station installation
- Establish partnership with local banks/credit unions for program participants to finance system cost





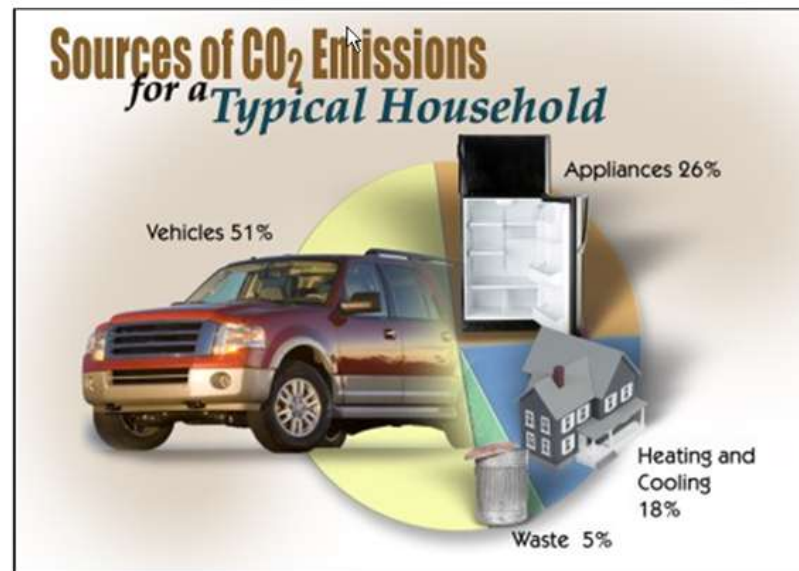
# Why Would a Utility Care?

- Utilities are required to meet Renewable Portfolio Standard (need RECs)
- Utility owns the Renewable Energy Credits (RECs)
- Utility gets the RECs for \$1/w
- Utilizes dollars that would have been spent on foreign oil to help meet the Renewable Portfolio Standard (keeps electric rates low) and all customers happy



# Why Would a Utility Care?

- More nighttime load helps “must-take” energy issue with wind & geothermal integration
- 50% of household CO<sub>2</sub> emissions comes from cars
- I Repeat: **50% of household CO<sub>2</sub> emissions comes from cars**



\* Does not include CO<sub>2</sub> from public transportation and air travel.

# Other Benefits?

- PV panels made in (your state) get the \$1/w incentive??
- Charging stations made in (your state) get the incentive??
- Urban air quality
- Energy security



# Job Creation For:

- EV manufacturing (right Tesla?)
- Solar installations
- Engineering/design
- Charging station installations
- Solar panel manufacturing
- Charging station manufacturing
- Lithium mining (Nevada)



## Revenue:

- Revenue source for city/county permitting agencies
- Large sales tax revenue stream (road taxes would apply to EVs also)

Summary: Using net metered solar energy to charge cars can benefit utilities, customers, air quality, energy security, and the planet (that's all).

Thank You!



# Will Electric Cars Be Available?

- There are more than 20 models coming in the next two years
  - Ford will have at least 5 models by 2013
  - GM will have at least 3 models by 2013
  - All major vehicle manufacturers now making electric cars



2012 Ford Focus EV



2011 Chevy Volt



2011 Nissan Leaf

# Will Electric Cars Be Available?



BMW Active E 2012



Ford C-MAX Energi 2012



Honda Fit EV 2012



Toyota RAV4 EV 2012



Toyota Plug-in Prius 2012



VW Blue-e-motion 2013



Tesla Model S 2012



Ford Transit Connect 2011