FLORIDA SOLAR ENERGY CENTER®

Creating Energy Independence

PV Manufactured in Florida for $1.08 a gallon

James Fenton

"Game Changers" The New Electric Cars

- 80% of VMT is less than 40 miles per day
- 26% of Florida vehicles are small cars
- 4,000 kWh/yr for 12,000 miles
- **If all small cars electric**
  - 1.4 billion gallons of gasoline saved per year
  - $2.6 billion net cost savings per year if PV electric
  - 15 TWh (billion kWh) additional energy needs per year (4 MORE LARGE POWER PLANTS)!

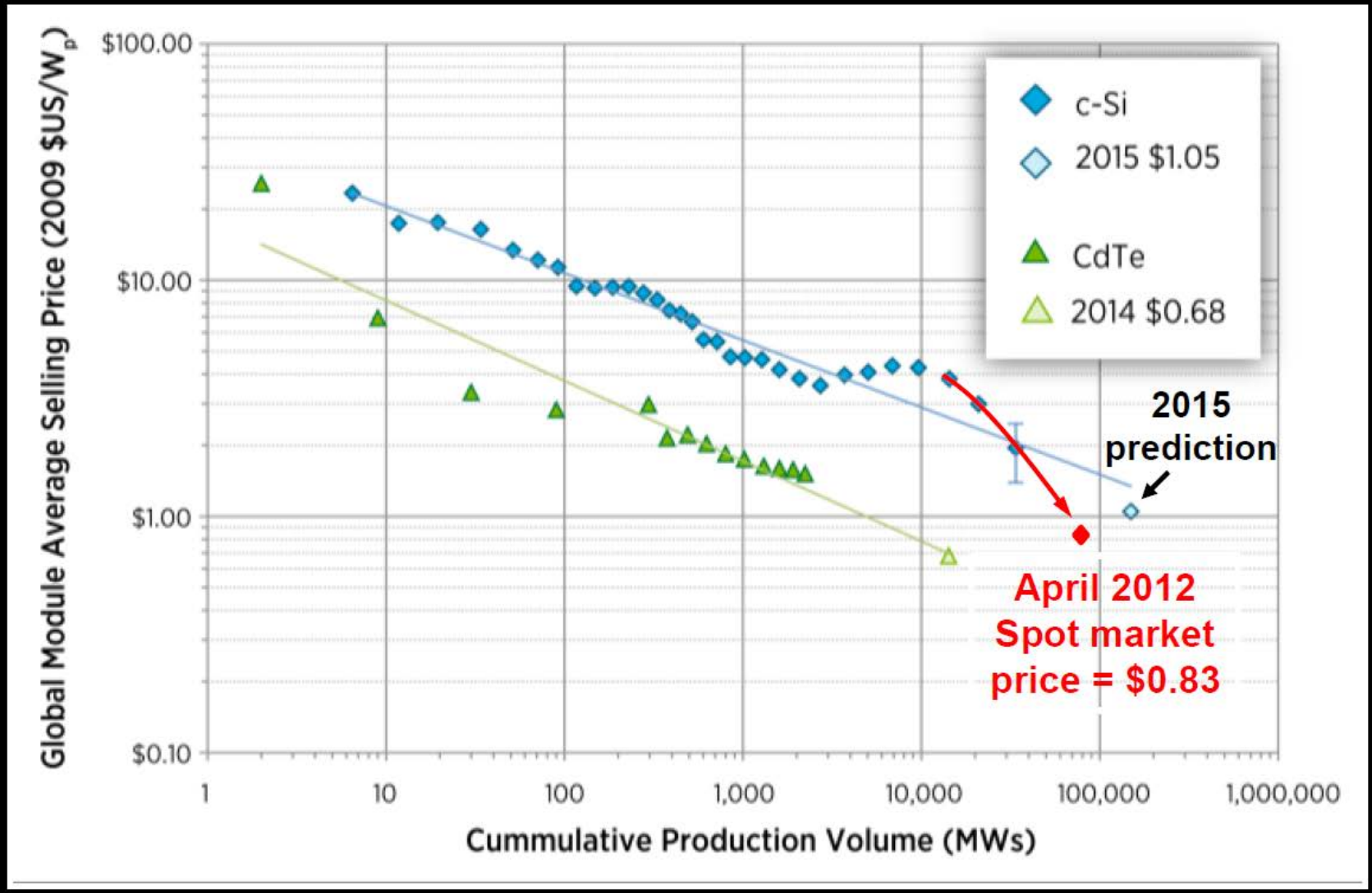
Nissan Leaf (all electric)

Chevy Volt (plug-in hybrids)

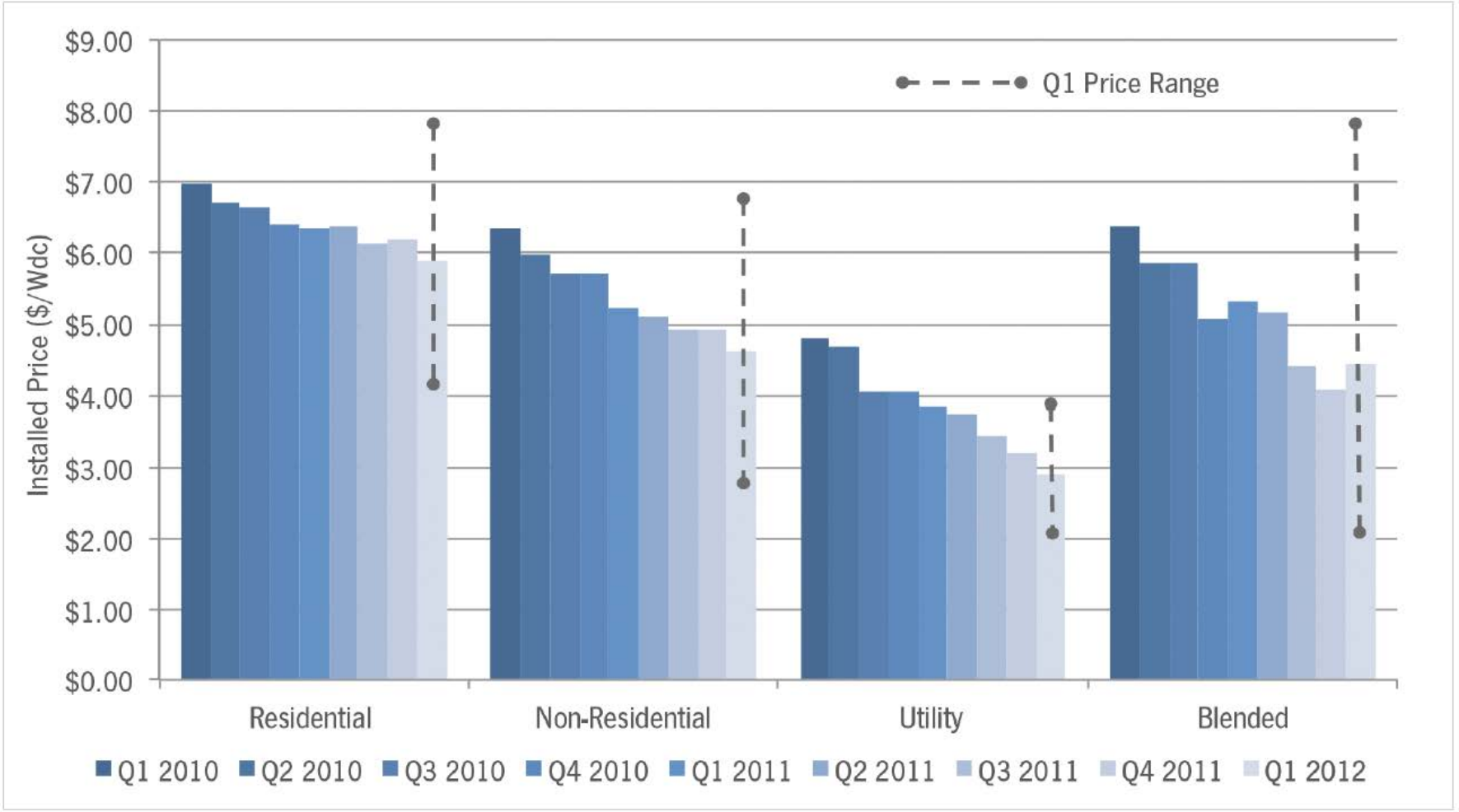
Total Cost of Electric Car ~ Cost of Gasoline Car at the end of 5 years

Costs of PV modules are dropping below the power law experience curves

Sources: (CdTe) First Solar Earnings Presentation, SEC Filings;
(c-Si) Navigant, Bloomberg NEF, NREL internal cost models

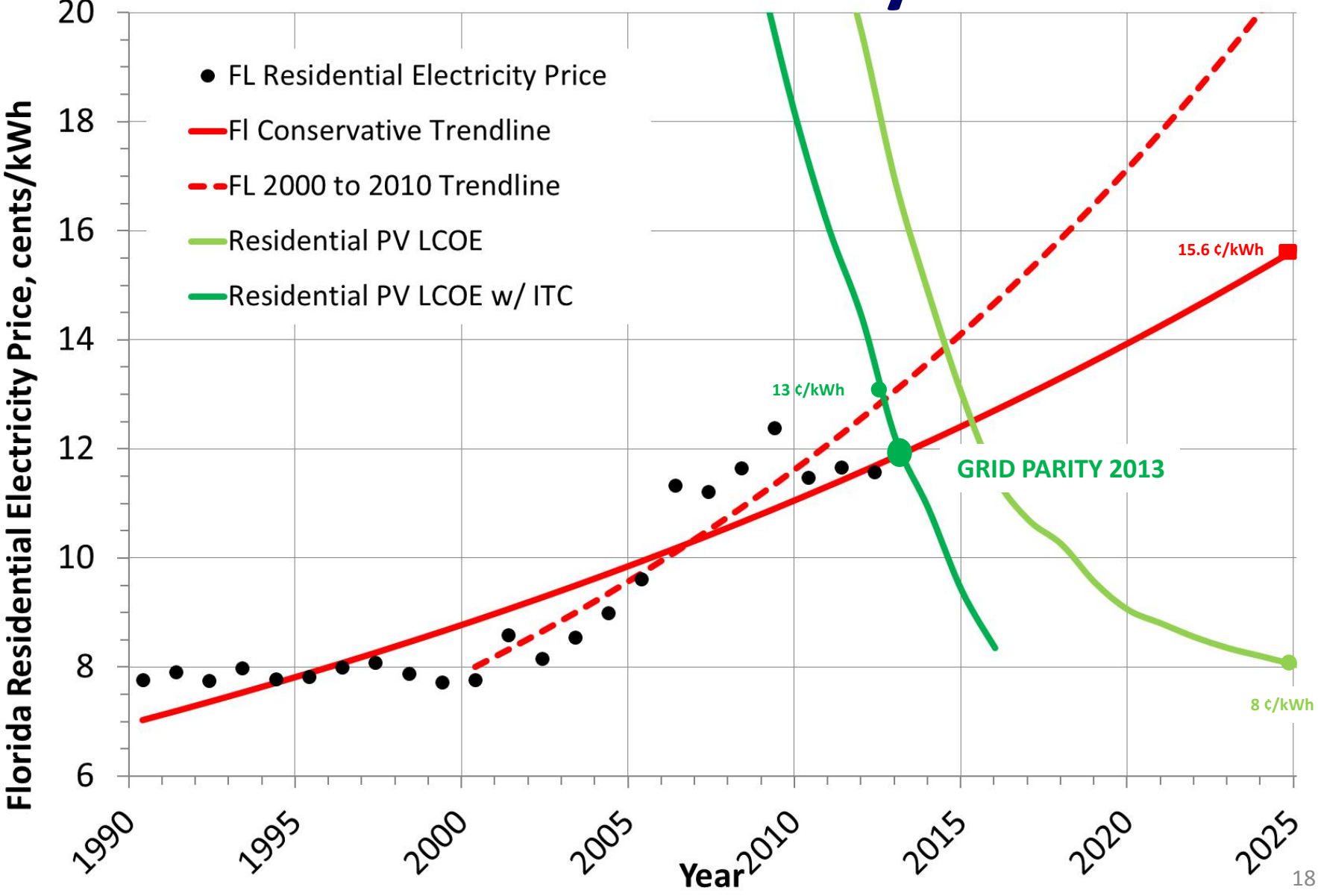


Installed Price of PV



National Weighted Average System Prices, 2010 –Q1 2012

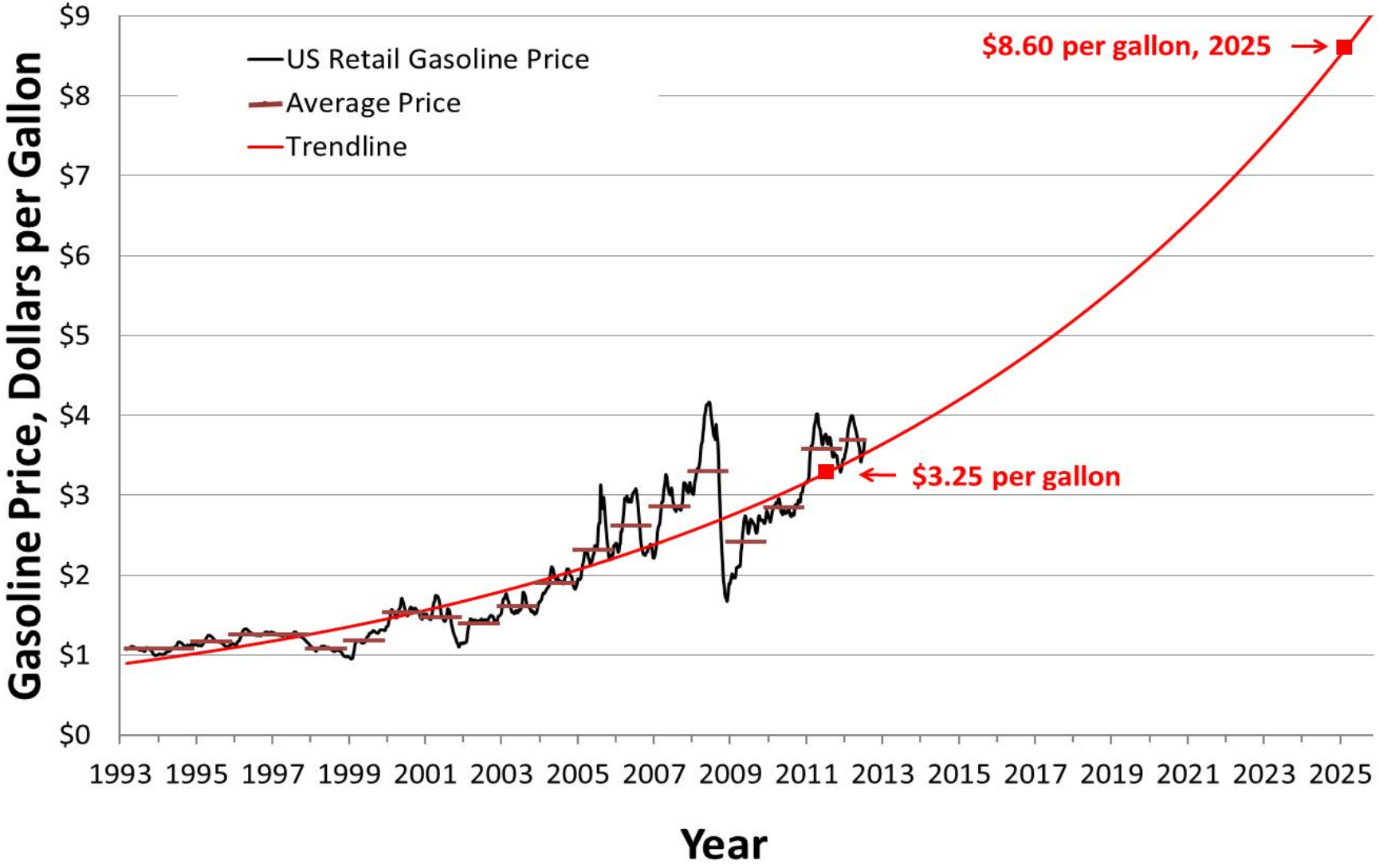
PV Grid Parity?



Residential Photovoltaic Power is Equivalent to $1.08 Per Gallon Gasoline

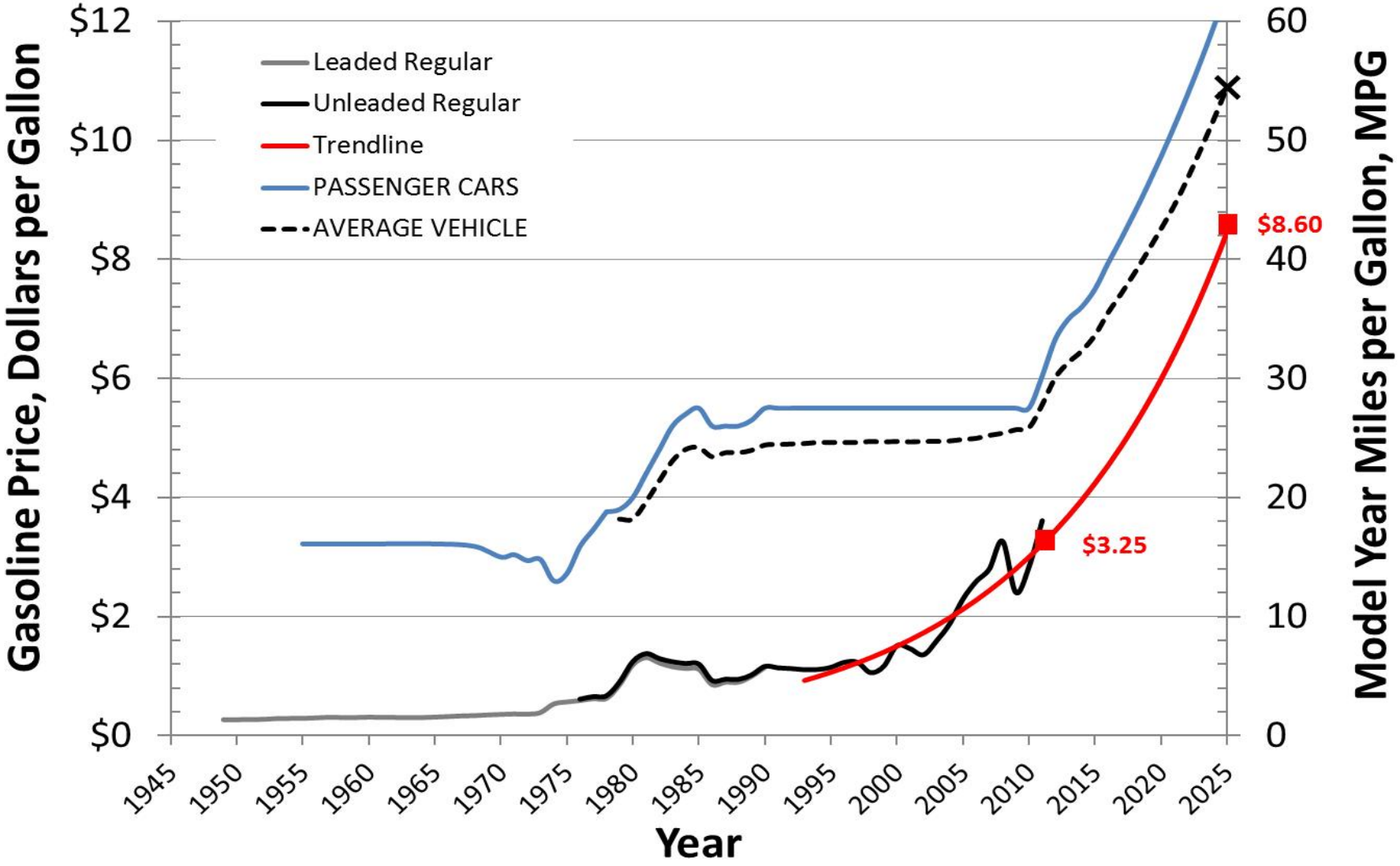
	Fuel Efficiency	Fuel Price	Cost per Mile	Cost per 12,000 Miles
	25 mpg	$3.25 per gal	13¢ per mile	$1,560
	3 miles per kWh	13 ¢/kWh ($1.08 per gal equiv.)	4.3¢ per mile	$520

Future Price of Gasoline?

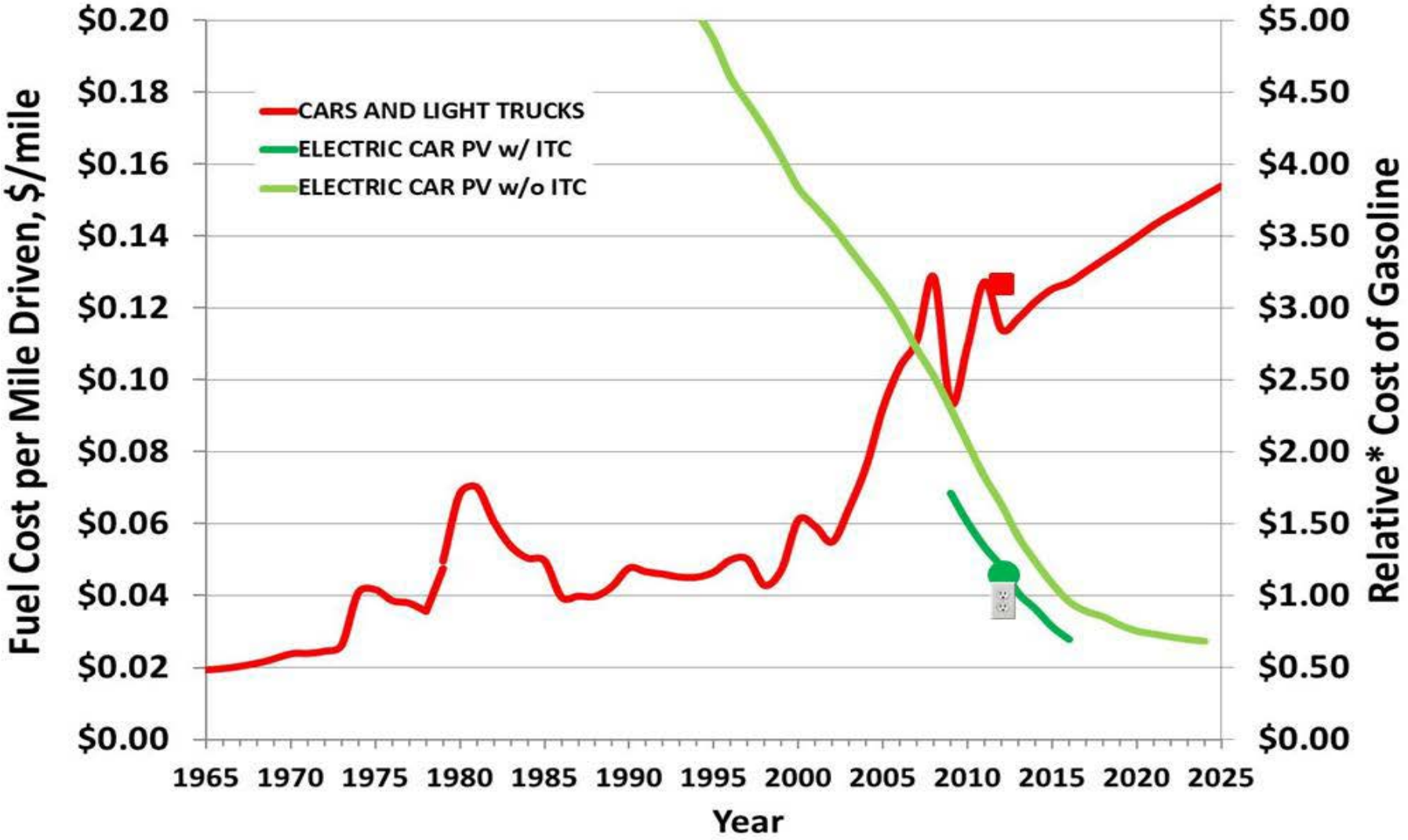


Price of Gasoline?

LIGHT-DUTY VEHICLE FUEL ECONOMY STANDARDS, 1955-2025



PV $1.08 a gallon today less than a $1 tomorrow

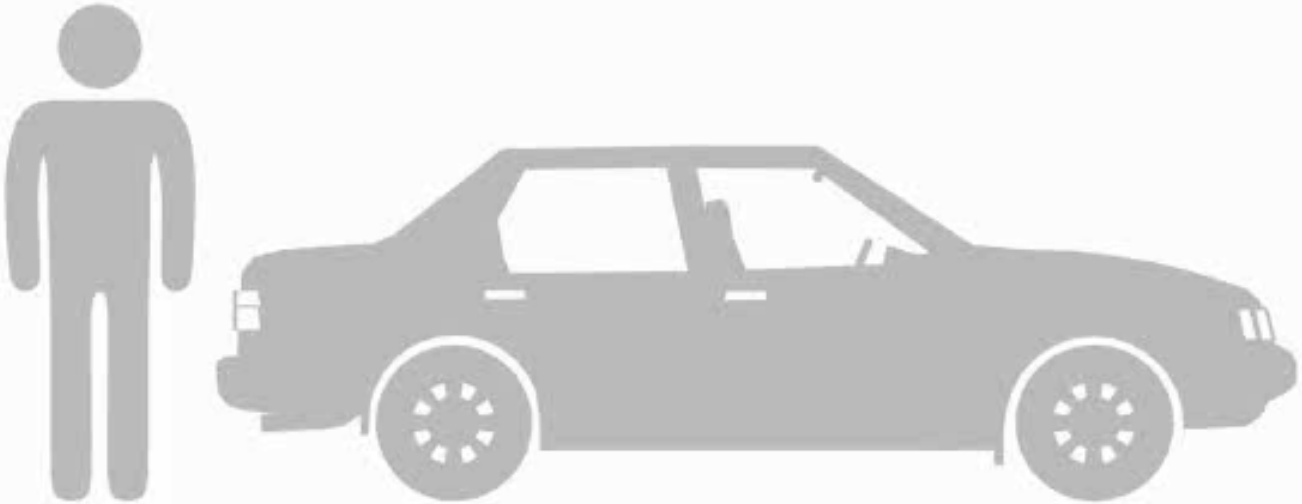


* Costs are relative to cost of $3.25 per gallon gasoline at a vehicle efficiency of 25 mpg


A Florida
Fable
"The Foreign Fuel"

Extra Slides

Drive for Free



4:17 minute video
http://vimeo.com/24514610

The Cost of Doing Nothing

The Cost of Doing Nothing

(5:53 minutes) http://vimeo.com/14676549

Building Training

- 38 building science courses offered
- More than 500 course attendees
  - Nearly 100 students received ENERGY STAR 3.0 training
  - 90+ students received weatherization training
  - 21 students received Florida green home certification training
  - Over 70 students received residential EnergyGauge® rater training

U.S. Photovoltaic Manufacturing Consortium (PVMC)

- DOE wanted a similar SEMATECH model for the PV Industry
- Led by SEMATECH in partnership with CNSE (College of Nanoscale Science and Engineering) and UCF (University of Central Florida)
- Overall investment of ~$300M over 5 years from DOE and matching funds

SEMATECH

Consortium Management

CIGS

cSi

Initial PVMC cSi Program Areas

$14.3M of DOE and industry/partner matching funding

In-line/Off-line Metrology

- Primary Goals
  - Identify critical industry needs in metrology and rank
  - Develop projects to demonstrate new cSi metrology technologies
  - Transition new metrology technologies into pilot and manufacturing lines

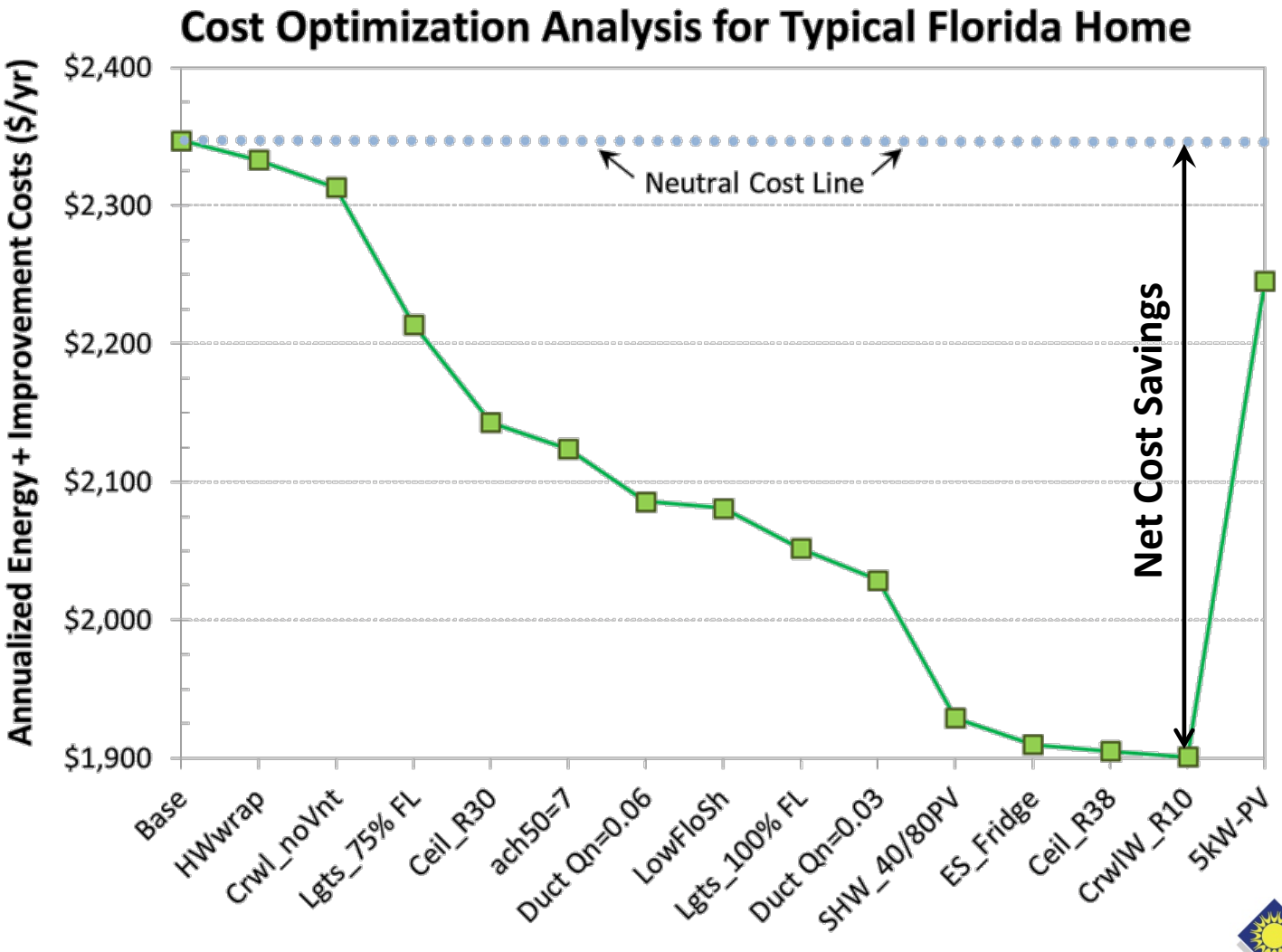
New Feedstock/Wafering Methodologies

- Primary Goals
  - Identify necessary feedstock/wafering targets for $/W
  - Establish cSi feedstock/wafering programs to accelerate transition of new technologies into mainstream manufacturing
  - Provide and foster process, test, and demonstration activities to validate new technologies and identify technical barriers

Which Purchase Is Best for Florida?

Which Purchase Is Best for Florida?

A Central Florida Example



Residential Electricity is Equivalent to $0.99 Per Gallon Gasoline

	Fuel Efficiency	Fuel Price	Cost per Mile	Cost per 12,000 Miles
	25 mpg	$3.25 per gal	13¢ per mile	$1,560
Electric Car 	3 miles per kWh	12 ¢/kWh ($0.99 per gal equiv.)	4¢ per mile	$480 (~$466, Drive for Free)