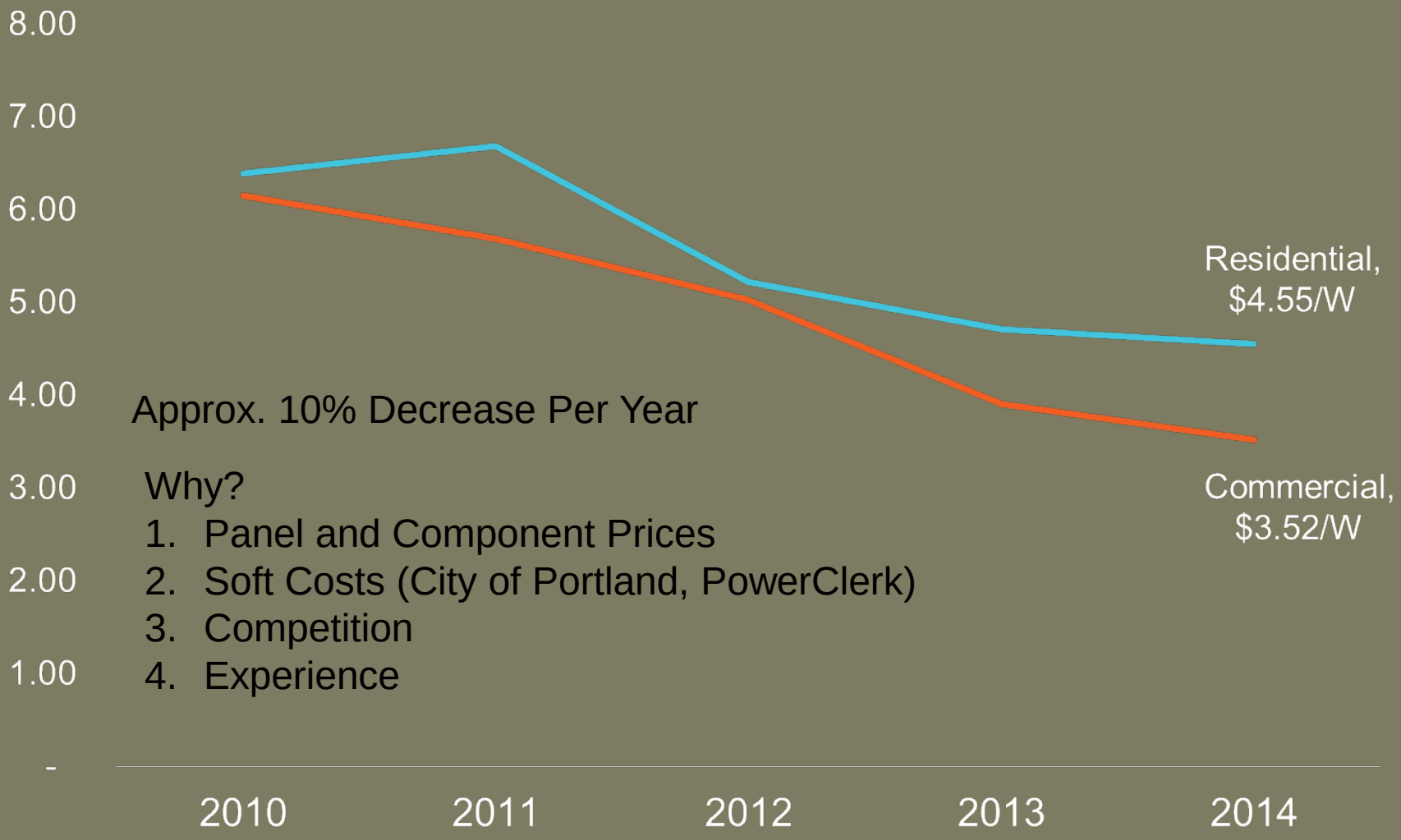
OSEIA

Oregon Solar Energy Industries Association

Costs Have Decreased Dramatically



Approx. 10% Decrease Per Year

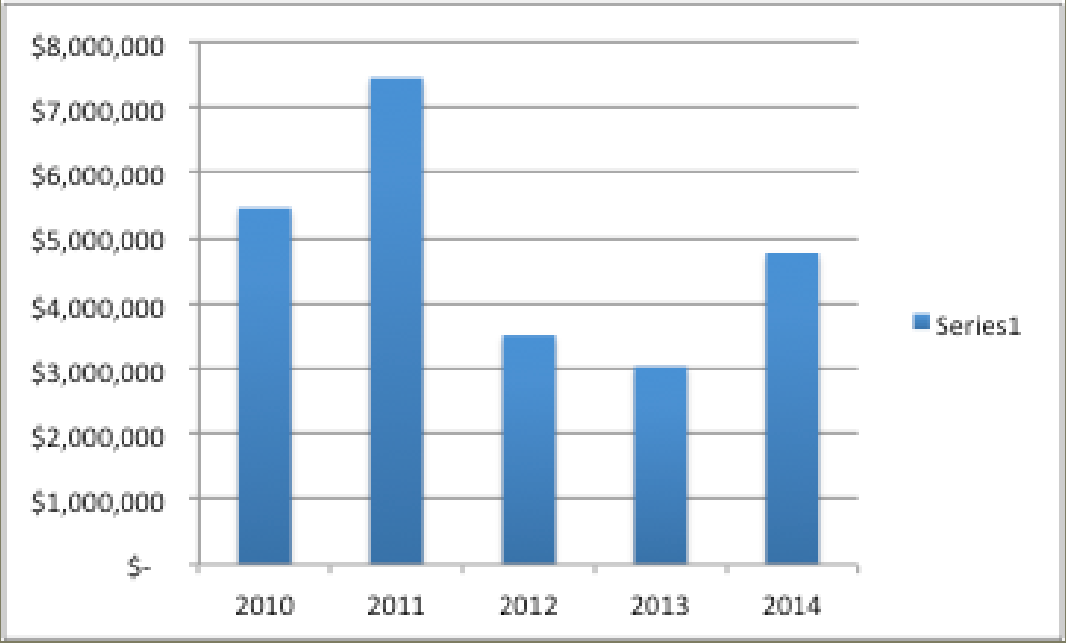
Why?

1. Panel and Component Prices
2. Soft Costs (City of Portland, PowerClerk)
3. Competition
4. Experience

Source: Energy Trust of Oregon.
Weighted-average $/W by Energy Trust reservation date.

Cost Decreases Means Incentives Go Further

ETO Residential Installations in Incentives

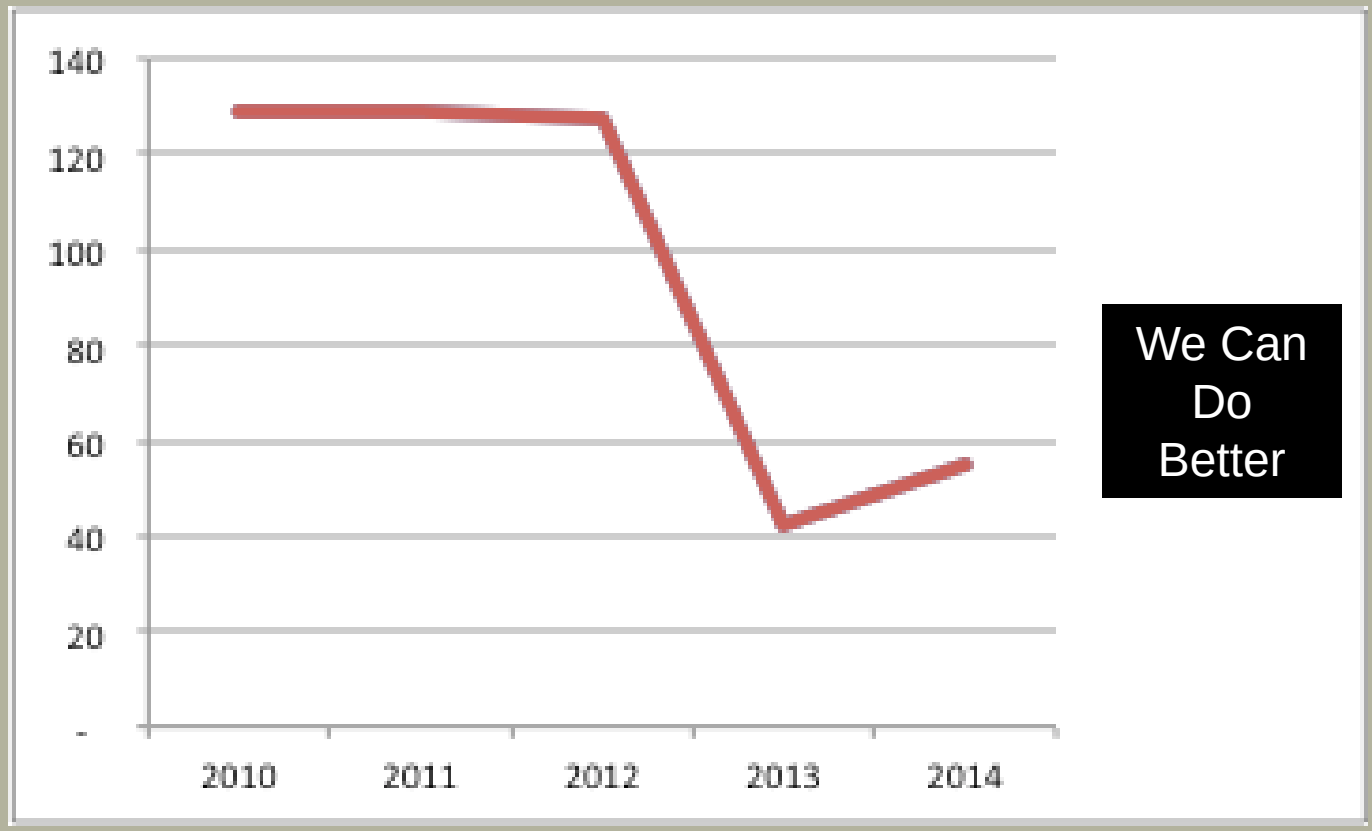


Summary

EnergyTrust of Oregon Residential Installations			
Year	**No. Systems**	**Installed kW**	**Incentive ($)**
2011	1,199	4,552	$ 7,446,650
2014	1,238	6,910	$ 4,773,221

Source: Energy Trust of Oregon

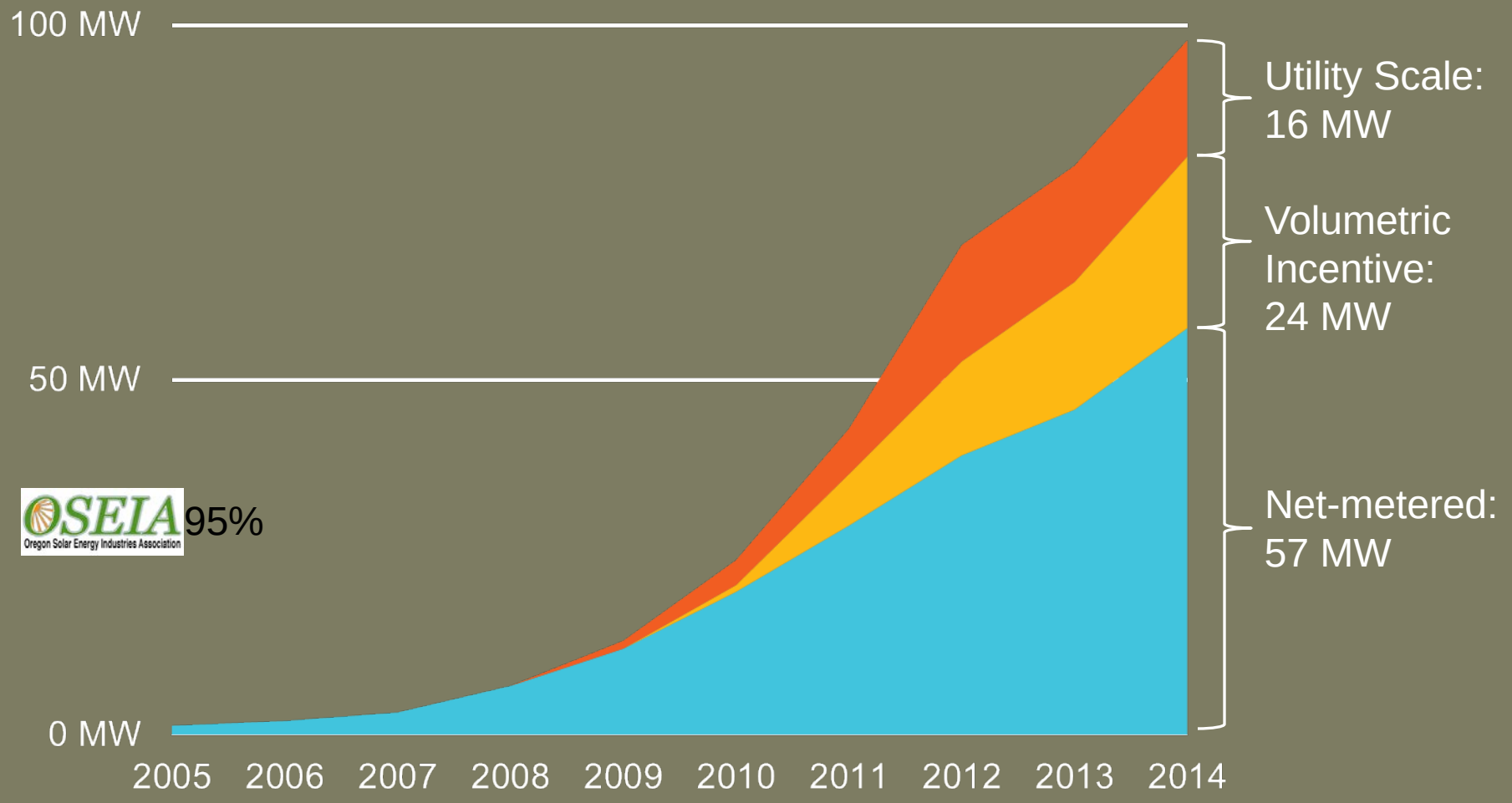
Oregon Commercial Solar Oops!



Funding basically went from $150M to $1.5M

Oregon Installers Need a Portfolio of Installations to Keep Costs Declining. Residential, Commercial and Utility Scale

Oregon Cumulative History



OSEIA Oregon Solar Energy Industries Association 95%

Oregon solar photovoltaic installations (MW-DC). Source ETO

100 MW Perspective

Pacific Power's Carbon Coal Plant Closing 2015 - 189MW

Source: BEF

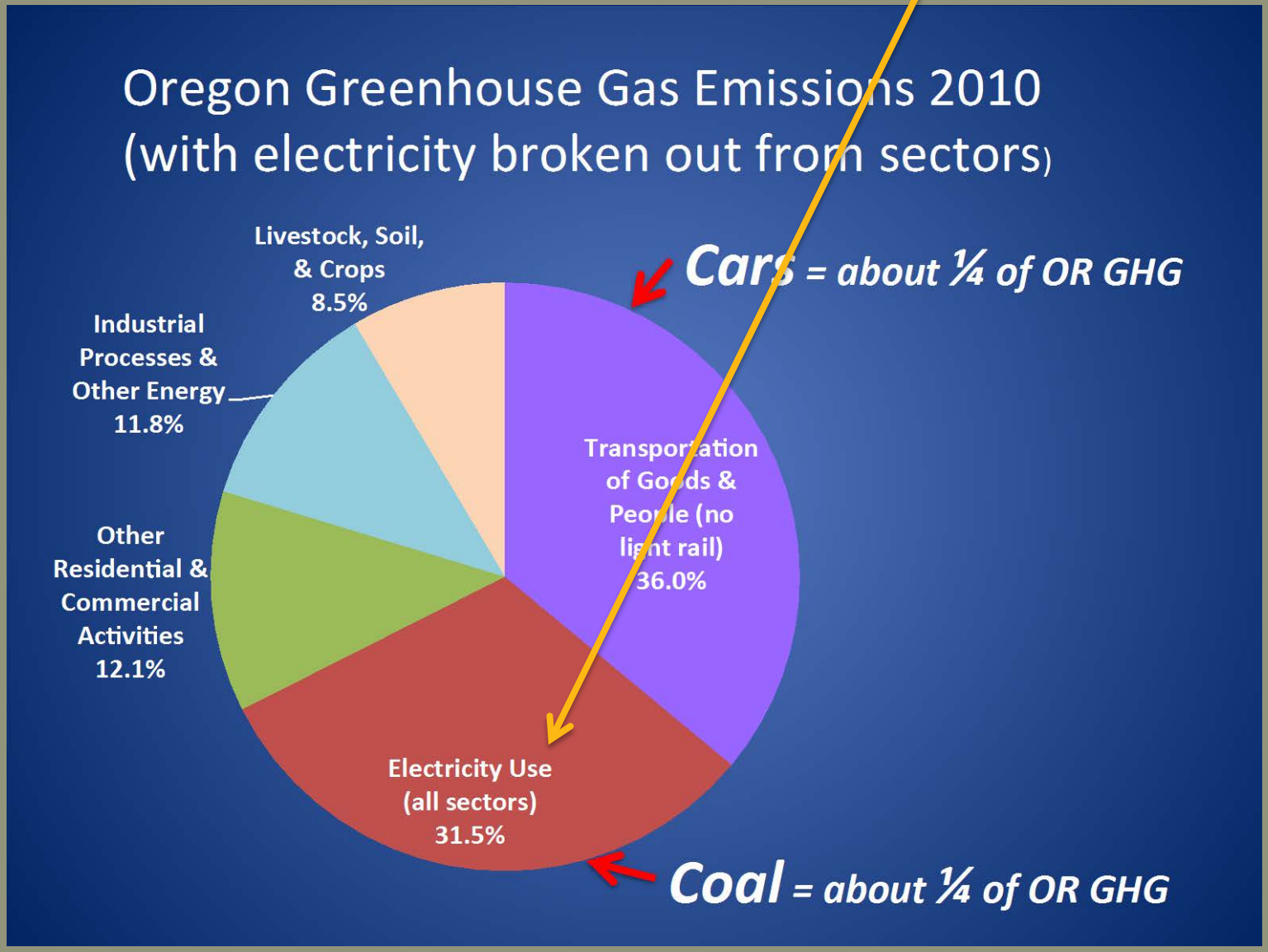
100 MW Means 10,000 customers Utility Bill Savings Staying in Oregon

Source: EnergyTrust of Oregon

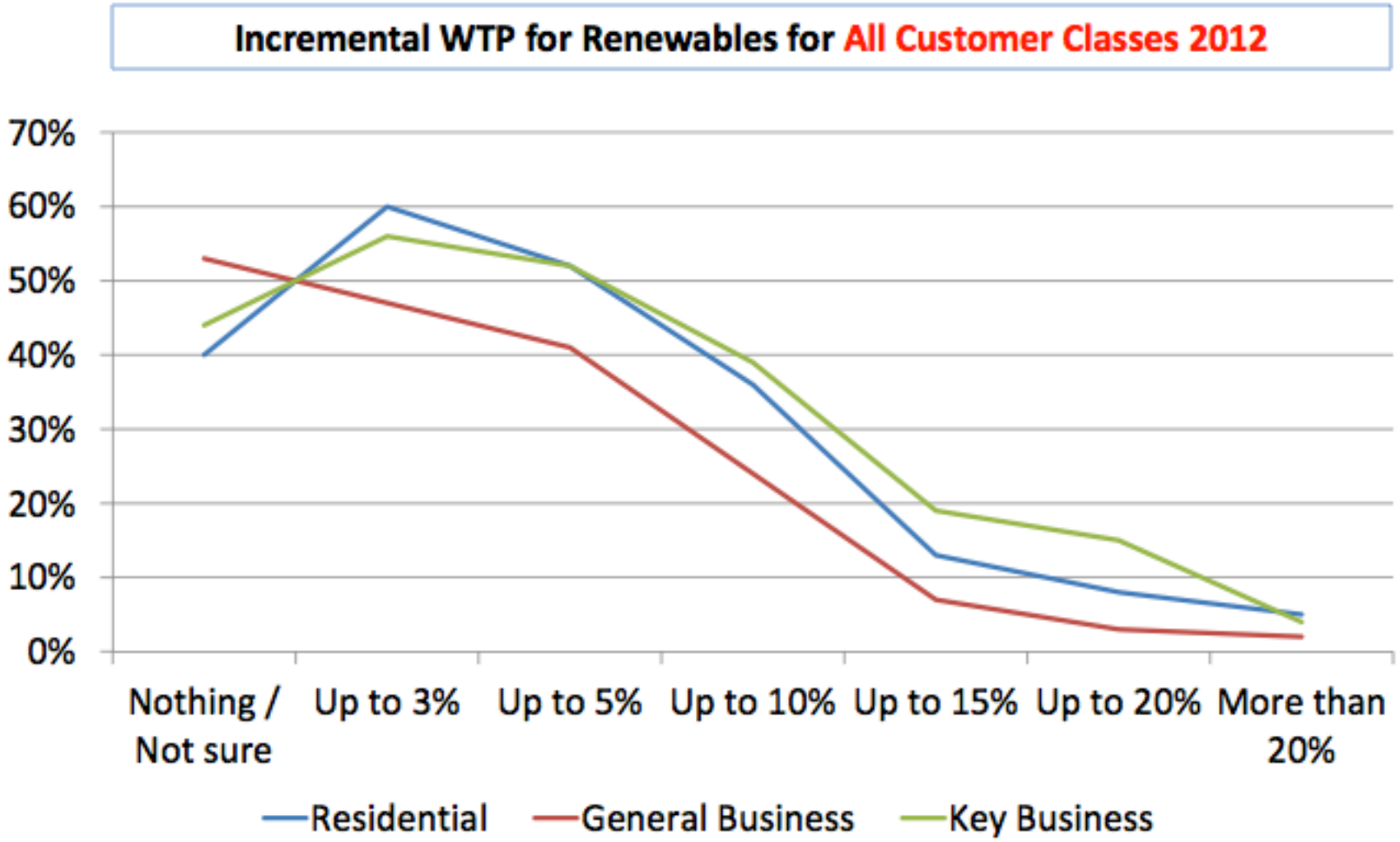
100 MW Still Drops Oregon out of Top Ten

State	Cumulative Solar Electric Capacity per Capita (Watts/ person)	Rank	Solar Electric Capacity Installed During 2013 per Capita (Watts/ person)	Rank	Cumulative Solar Electricity Capacity (MW)	Rank	Total Solar Electricity Capacity Installed During 2013 (MW)	Rank
Arizona	275	1	109	1	1,821	2	724	2
Hawaii	243	2	107	2	341	7	150	6
Nevada	161	3	17	9	450	5	47	12
California	148	4	72	3	5,661	1	2,760	1
New Jersey	136	5	27	6	1,211	3	240	5
New Mexico	113	6	22	7	236	10	46	13
Delaware	82	7	14	10	53	21	9	23
Massachusetts	66	8	37	4	442	6	244	4
Colorado	63	9	12	11	331	8	61	10
North Carolina	57	10	33	5	557	4	328	3

100 MW is a Good Starting Point but…
1/3 of GHG's are still from the Electrical Sector



Customers Continue To Say They Will Pay More for Renewable Resources Themselves



Study Showed How Much Oregonians Valued Renewables

DEFINITIVE INSIGHTS

What Are Oregonians Paying Now for Solar?

Rate Impact	PGE	Pacific Power	Total
ETO Average Per Year Paid Over 10 Years			$ 6,890,000
Utility Revenue	$ 1,800,000,000	$ 1,220,000,000	$ 3,020,000,000
ETO as a Percentage of Revenue			0.23%
Feed In Tariff Program via 2015 Legislative Report			0.25%
Total Rate Impact Solar in Oregon			0.48%

Why Solar Now?

More Energy Usage from:

1. Data Centers (Cities unto themselves, use more energy in summer)

2. Electric Cars

3. Marijuana
   - 49% of cost structure is energy
   - 1% of state electrical load presently (Medical + Illegal)

4. Air Conditioners and Mini-Split Heat Pumps

5. Summer Peaking

Source: PGE 2013 Annual Report – "…residential demand is sensitive to weather with historically highest during winter heating season; although increased use of air conditioners has caused summer peaks to increase."

Year	Winter Peak	Summer Peak
2013	3,869	3,527
2012	3,426	3,597
2011	3,555	3,340

What Does Recent Studies Show About Solar?

1. COMMUNITY OWNED SOLAR: Allows the 65-75% of Oregonians with shaded or other solar installation problems to choose Solar.

2. COST SHIFT: Studies have proven that solar doesn't create "Cost Shift" from solar Customers to non-solar customers. In fact, studies have shown most solar customers cover the cost for utilities to serve them.

3. NET BENEFIT: In fact solar customers not only pay their fair share but also reduce the utilities' cost to serve neighboring homes. Solar customers provide a net benefit to all ratepayers.

Case Study: Rhode Island Solar Program

Table: Emissions by Plant Type and Pollutant (Tons/MWh)

Source	CO2	SO2	NOX	PM-10/2.5	Mercury
Gas-Fired	0.5781	.0000	.0009	.00002	.0000
Solar	.0000	.0000	.0000	.0000	.0000

1. Economic Output ↑
2. Employment ↑
3. State Tax Revenues ↑
4. Rates, LT ↓

RI is 98% Natural Gas!

Study required by the Governor, the President of the Senate and the Speak of the House of Representatives

Case Study: RI Solar Installation Monies Stay in State. Having an In-State Module Manufacture is Important.

Table 6: Breakdown of PV Construction Costs, Rhode Island

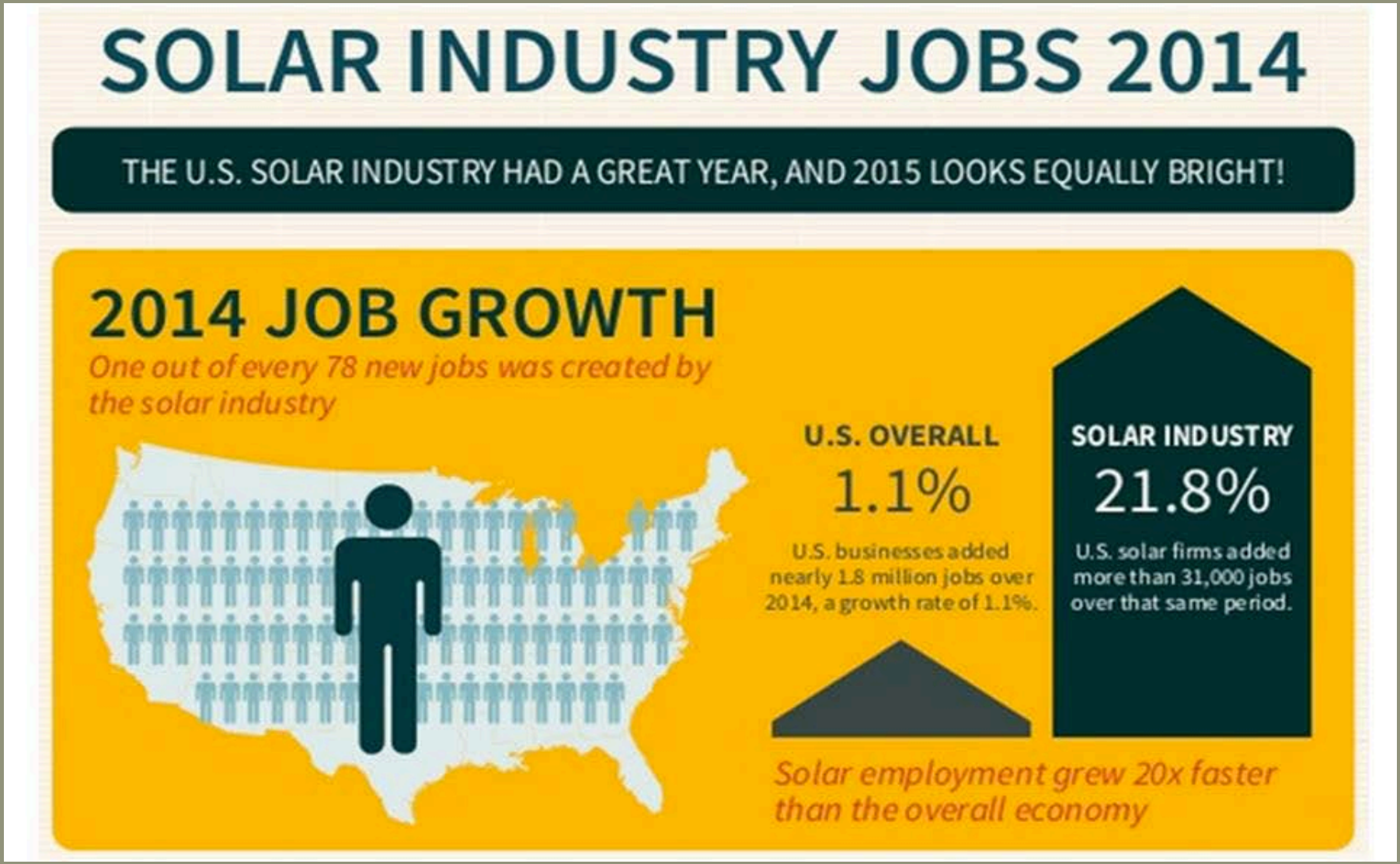
Category	Share	% In-State
Modules	31.72%	.23%
Installation and Overhead	43.41%	98.13%
Inverters	5.72%	2.41%
Wires, connectors, breakers, etc.	2.54%	4.30%
Mounting	3.95%	5.46%
Permitting and other Costs	12.65%	84.19%
Weighted Avg. In-State Share		53.78%
Source: NREL JEDI Models, IMPLANT		

In-State Module Manufacturer SolarWorld

2,000 Workers
and Expanding

ETO
SolarWorld %
Useage

2010, 34%
2011, 42%
2012, 59%
2013, 33%
2014, 34%



Solar energy creates more jobs per megawatt installed than any other energy resource—7 times that of natural gas!

Why Solar Now?

Load is growing
Summers are warmer
Oregonians want solar and will pay
Installed Costs are Decreasing
Solar is Cost Effective and Good Public Policy
We need Residential, Commercial and Utility Scale

Final Thought

Solar will win out over fossil fuels as solar is a technology, not a fuel. Technologies Evolve.

Just look on the top of this building!