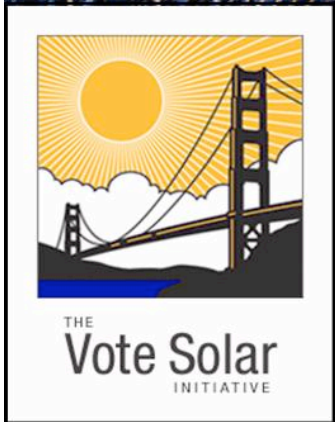
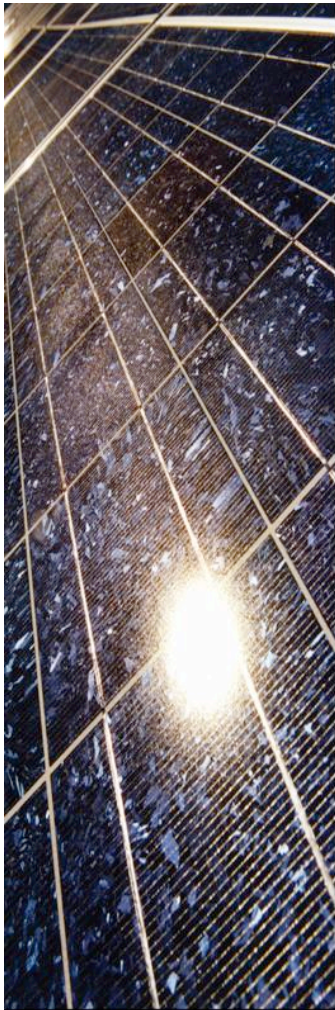


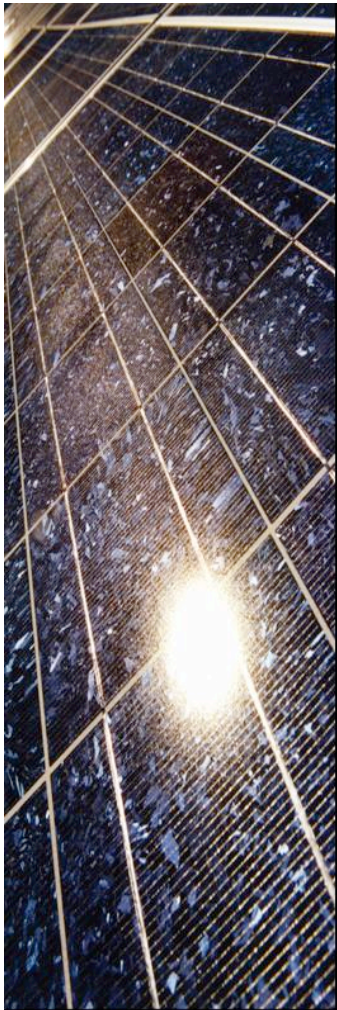
Jobs and Economic Impacts

An Analysis of Delaware's Solar Market

Peter Olmsted
The Vote Solar Initiative

April 13, 2011
Delaware Renewable Energy Taskforce

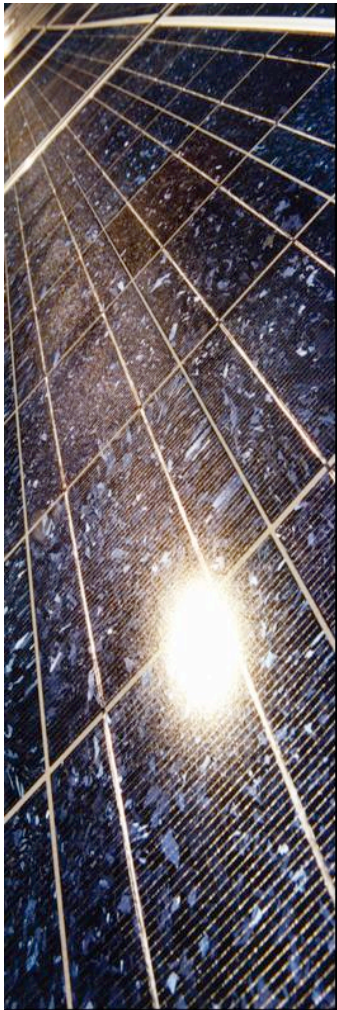




Who We Are & What We Do

- Non-profit org founded in 2001
- Bring solar to the mainstream through market transformation/level markets
- State, local and federal campaigns
 - 4 pillars of solar policy
- I will cover...
 - NREL's JEDI model
 - Application of JEDI to Delaware's market
 - JEDI Results





NREL's JEDI Model

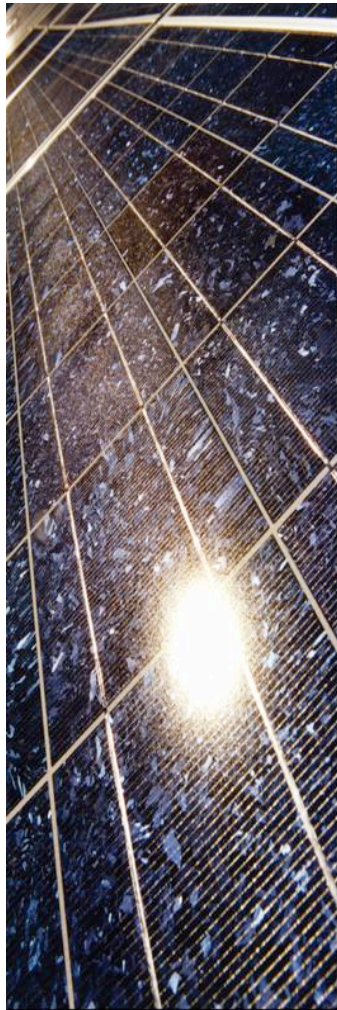
- Econ impacts of construction & operation
 - Biofuels, coal, CSP, natural gas, PV, and wind
- Methodology based off of IMPLAN
 - Minnesota IMPLAN Group
 - IMPLAN = IMpact analysis for PLANning
 - Input-output analysis model
 - Econ multipliers and consumption data
 - Regional & national data
 - Inter-industry linkages



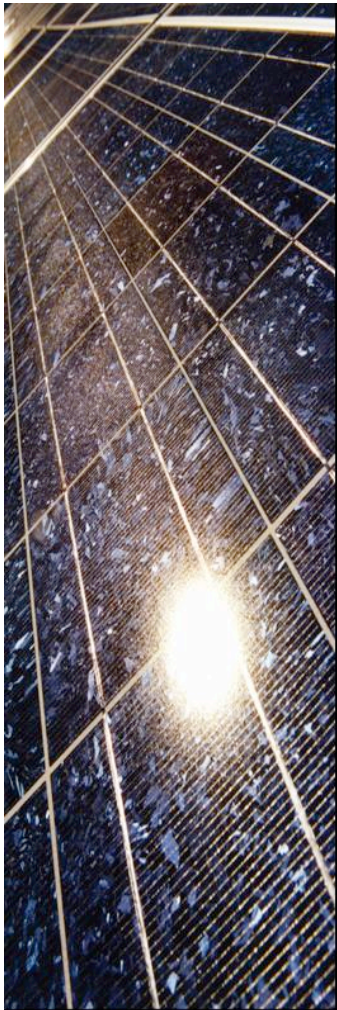
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Delaware Market Assumptions

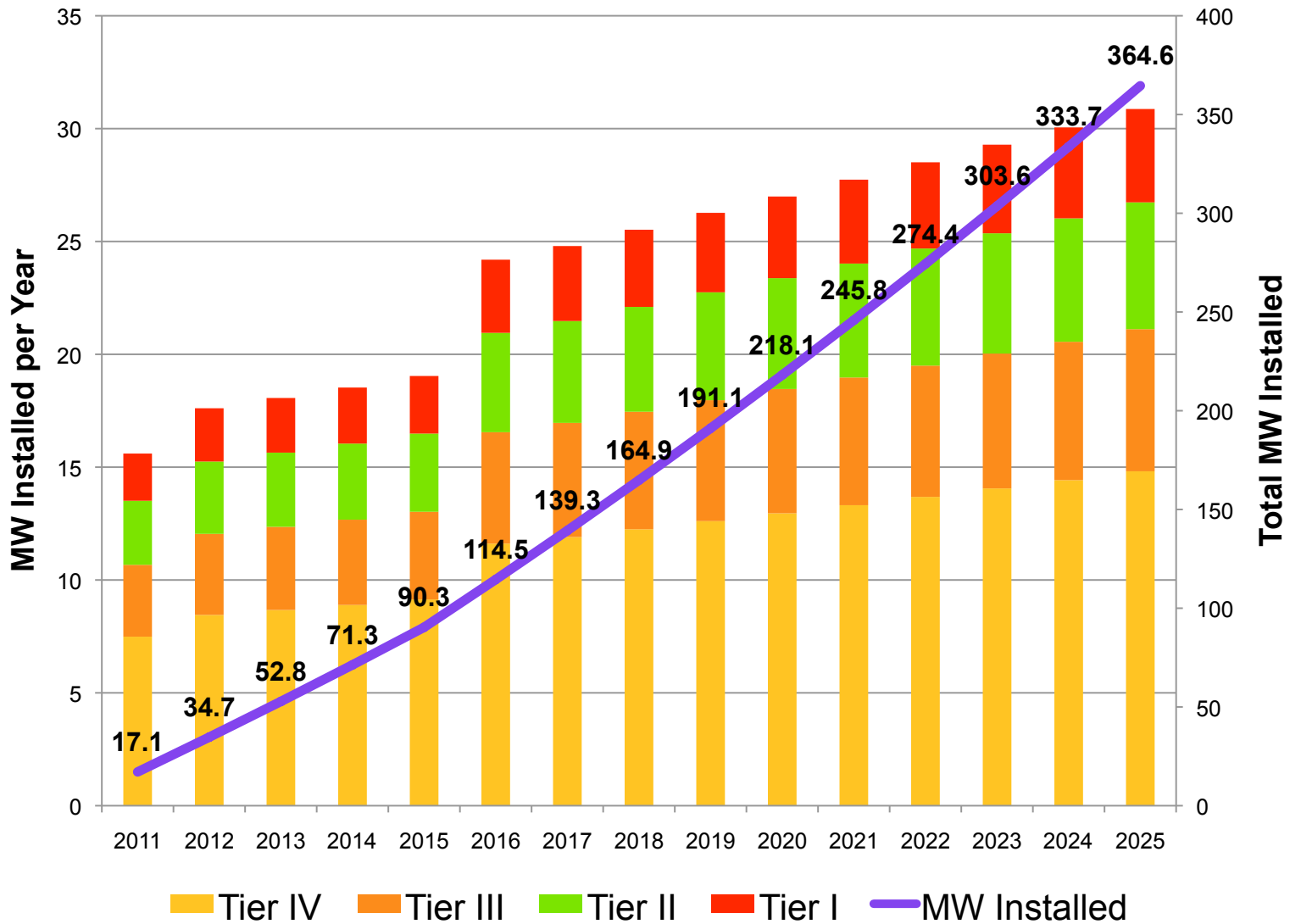
- Includes DP&L, DEMEC, DEC, TPS
- Capacity factor of 14% for all PV systems
 - 1,250 MWh/MW per Year
- Electricity sales projections presented at TF
- TPS sales derived from PSC - 1.2% annual growth
- Pilot Program Breakdown
 - Tier I – 13.4%
 - Tier II – 18.2%
 - Tier III – 20.4%
 - Tier IV – 48.0%



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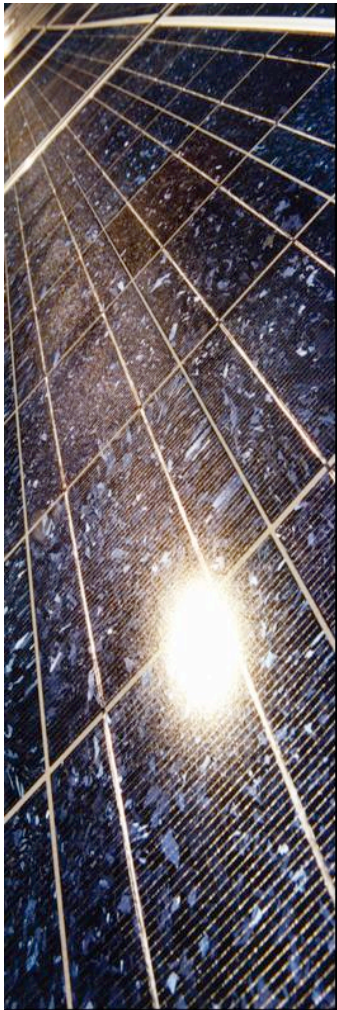


Solar Build Out Schedule



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* Does not include the 8.4 MW currently operable in Delaware



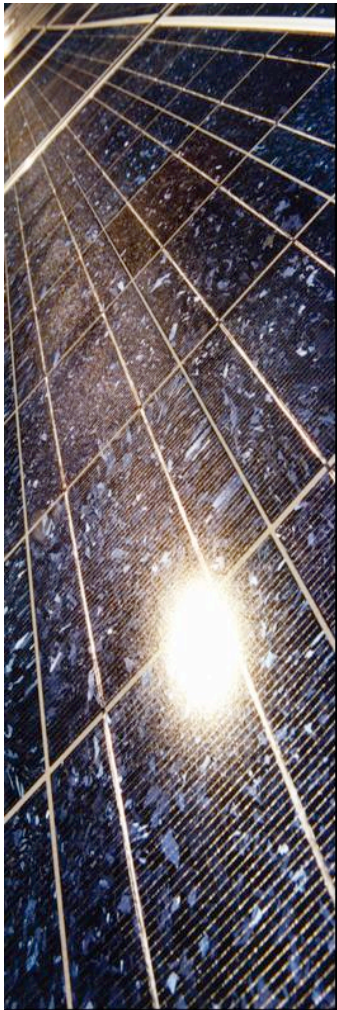
JEDI Scenarios

1. Tier I (small-scale) – 100%
 2. Tier IV (utility-scale) – 100%
 3. Tiers I through IV (all market segments)
- All scenarios run at high and low levels of local content, procurement, and labor

Tier	Size Range	Average Size
Tier I	≤ 50 kW	6.8 kW (DE PSC)
Tier II	> 50 kW to ≤ 500 kW	74 kW (DE PSC)
Tier III	> 500 kW to ≤ 2 MW	784 kW (PJM GATS)
Tier IV	> 2 MW	4.2 MW (PJM GATS)



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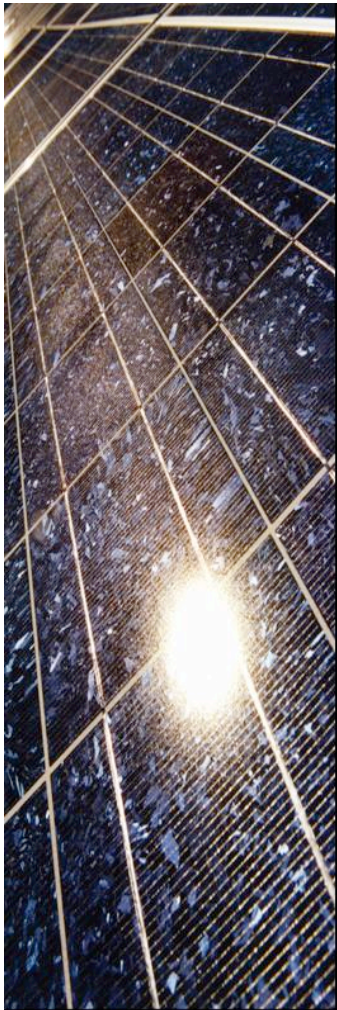
Local Content, Procurement, Labor

- Primary Variables (% spent locally)
 - Mounting: 30%
 - Modules: 20% to 75% w/ local manufacturing
 - Electrical: 100%
 - Inverter: 10%
 - Labor: 25% to 90%
 - Permitting: 100%
 - Overhead: 50% to 85%
- Low and high scenarios (range of potential)
- Encompasses min % of local content and labor req. for SREC multipliers

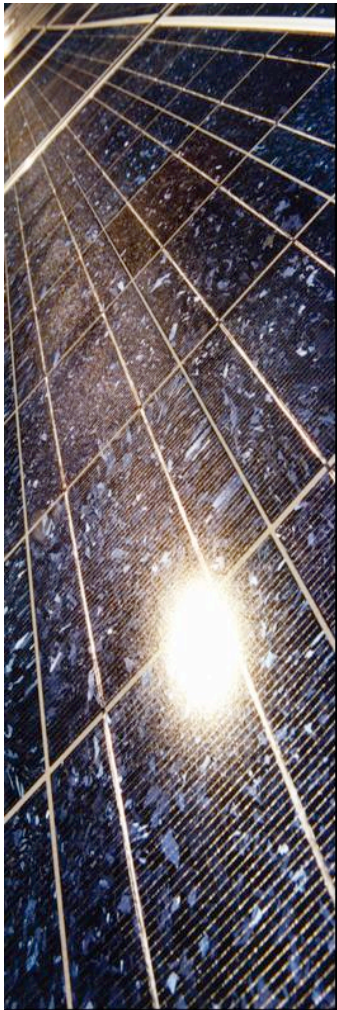


Assumptions/JEDI Inputs

- Average installed cost (Solarbuzz, Solar America Initiative, etc.)
 - Tier I = \$5.78/W_{DC}
 - Tier II = \$5.25/W_{DC}
 - Tier III = \$4.67/W_{DC}
 - Tier IV = \$4.25/W_{DC}
- Increasing average system size
- Decreasing average installed cost
- Direct O&M cost = \$21/MW (NREL)
- JEDI modeling applied through CY 2019
- Solar PV fleet by 2020 = 190 MW



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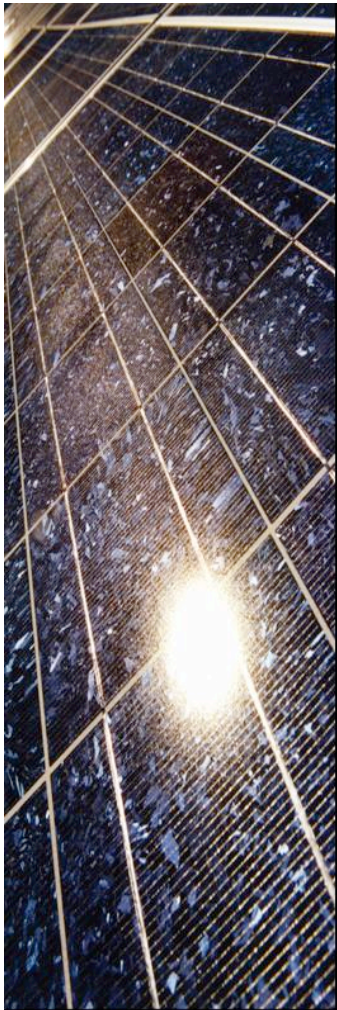


JEDI: Jobs, Earnings, Econ Outputs

- Impacts distributed across three categories
 - Project development & on-site labor
 - Local revenue, module & supply chain
 - Induced impacts
- Impacts occur during...
 - Construction & installation
 - Operations & maintenance



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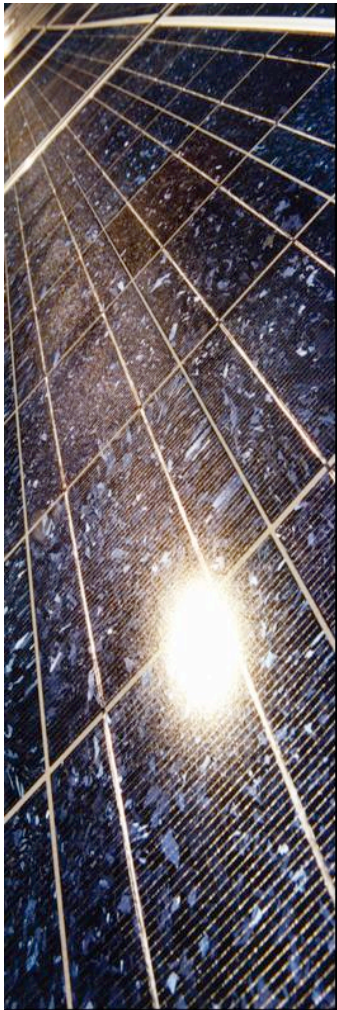


JEDI Impacts resulting from projects

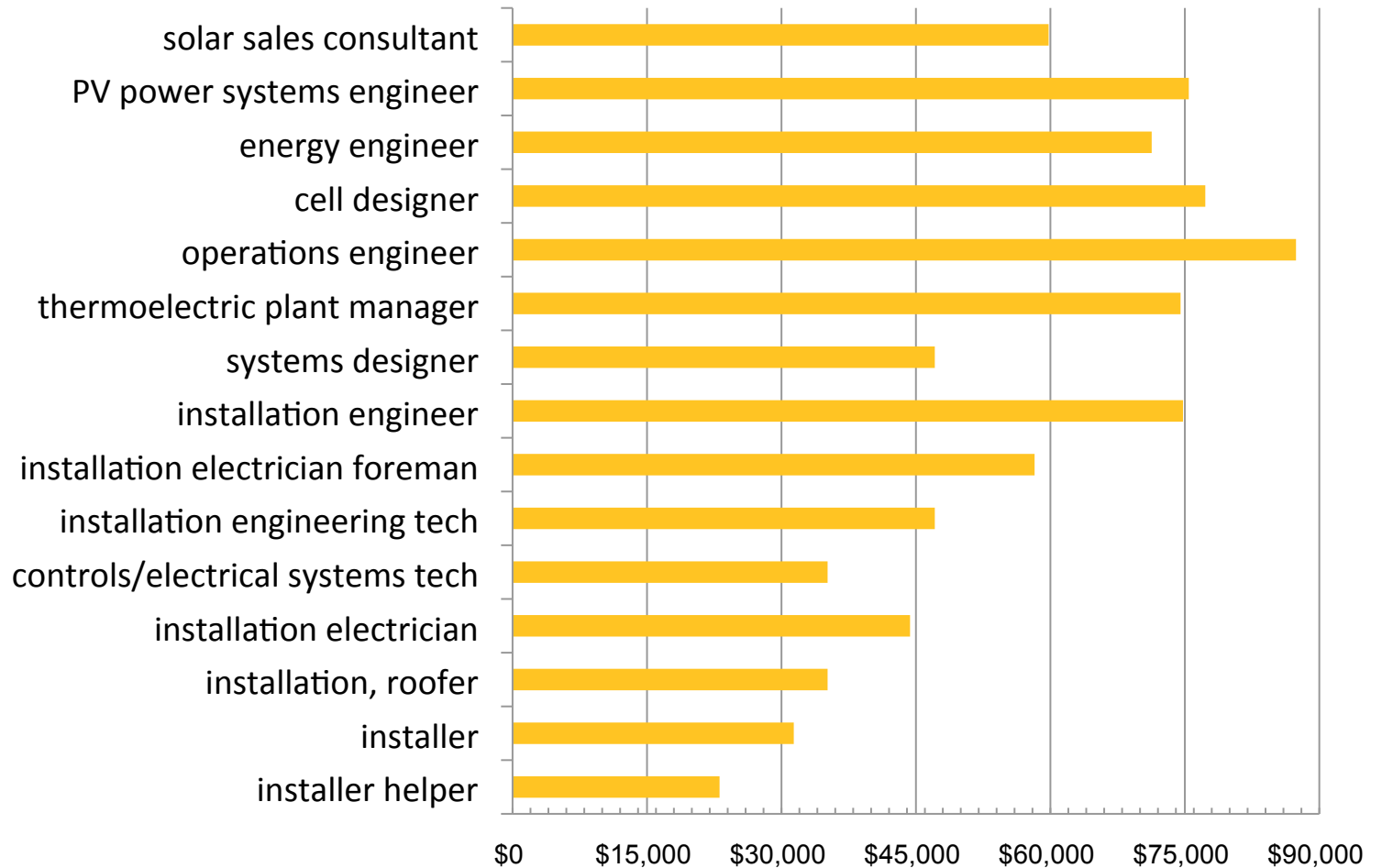
- Jobs – Full-time equivalent
- Earnings – Annual wages & salaries
- Economic Output – Local economic activity within the state
- Local Spending – Actual \$ spent on goods and services within the state



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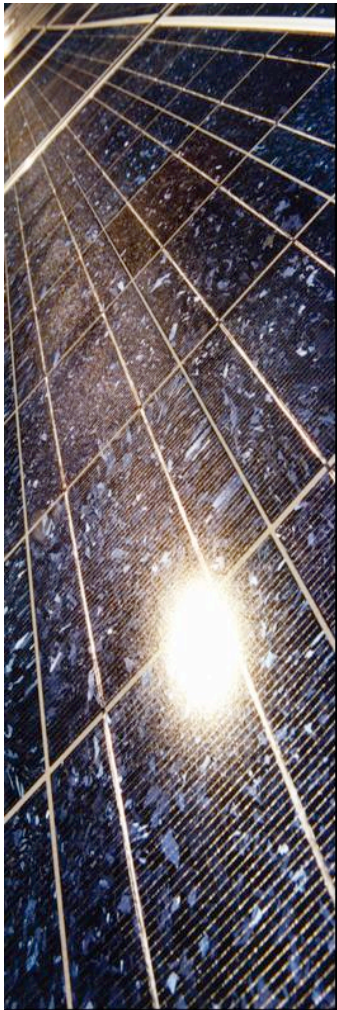


Examples of direct jobs



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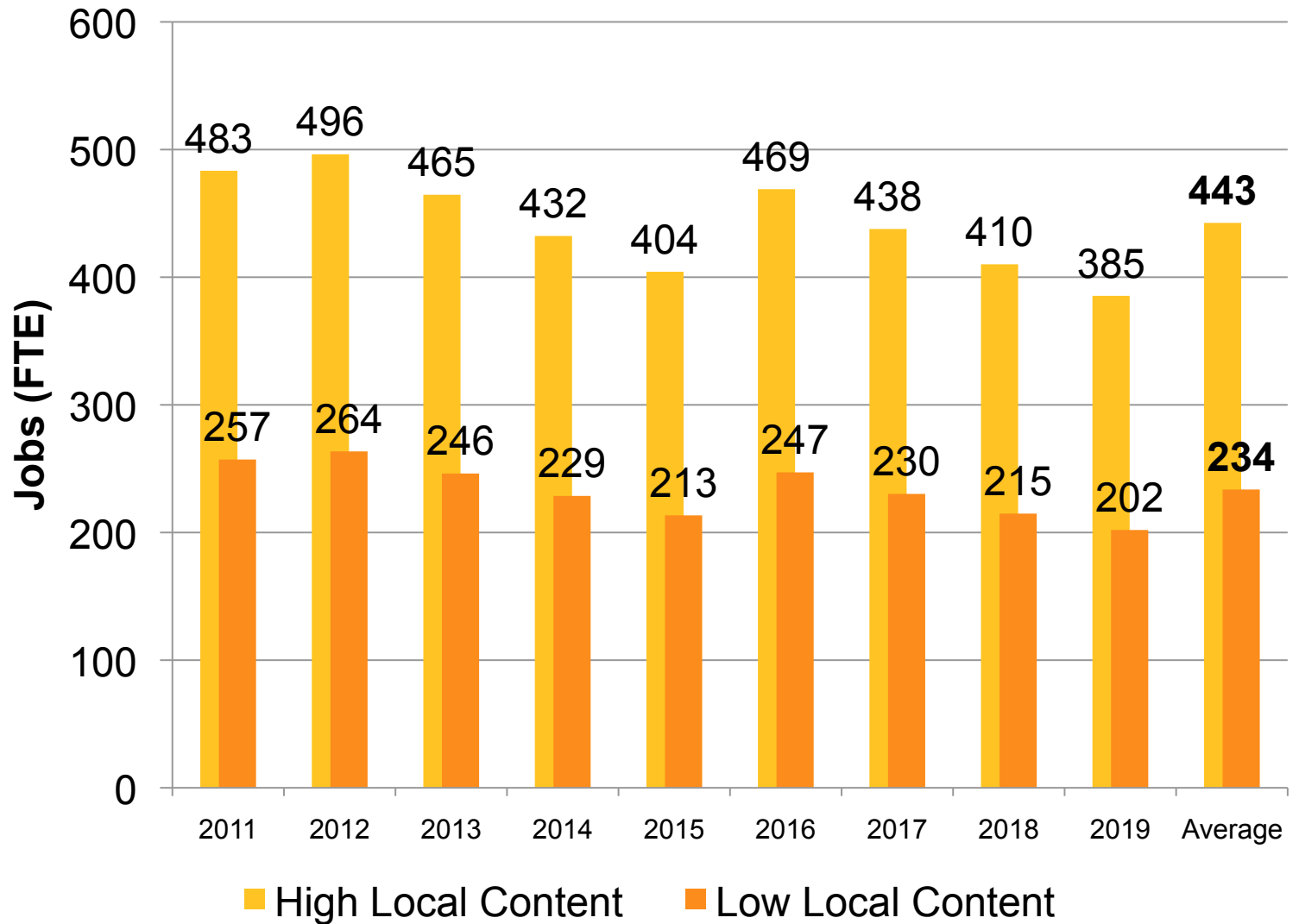
Source: Environmental Defense Fund and Management Information Services, Inc., 2008



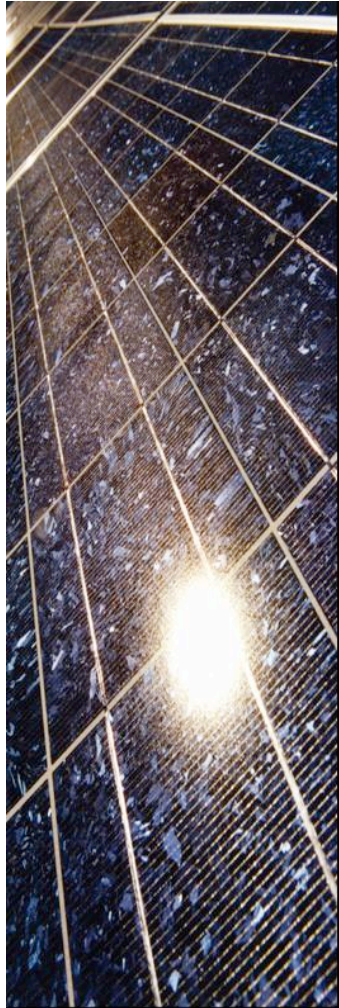
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Construction Period Jobs thru 2020

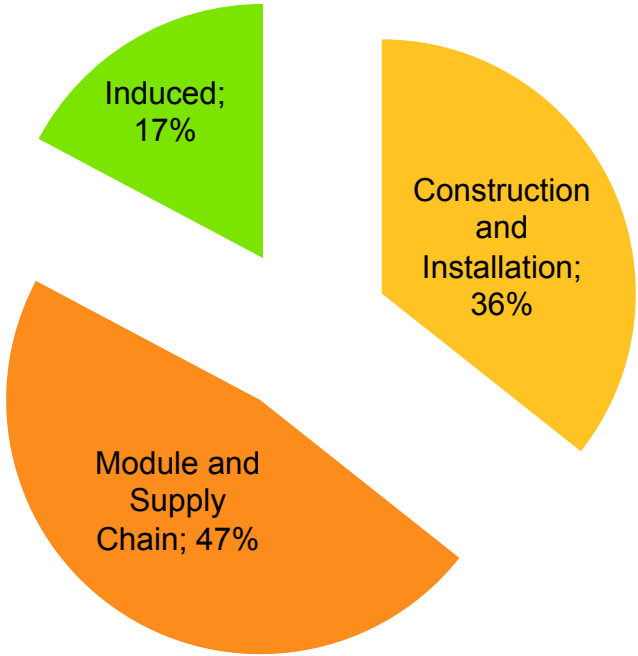
(all market segments scenario)



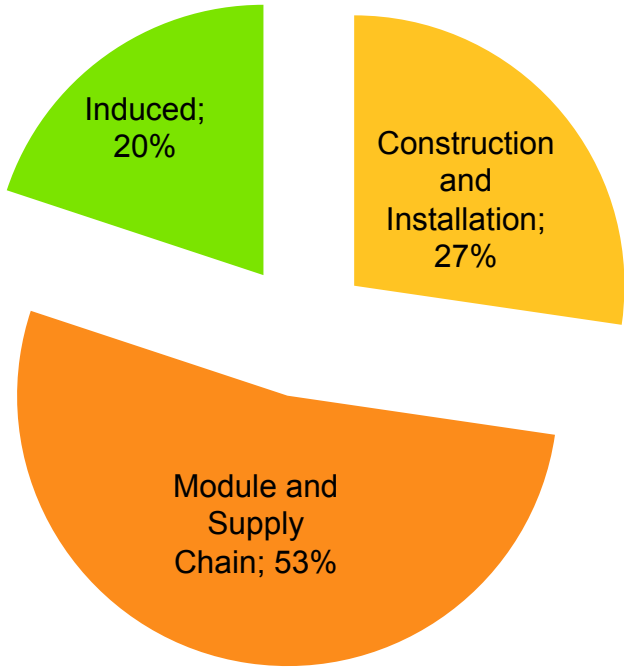
Jobs Impacts During Construction



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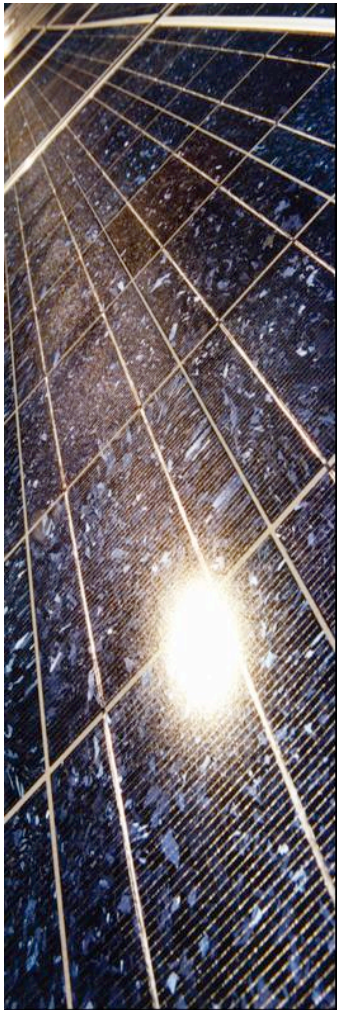
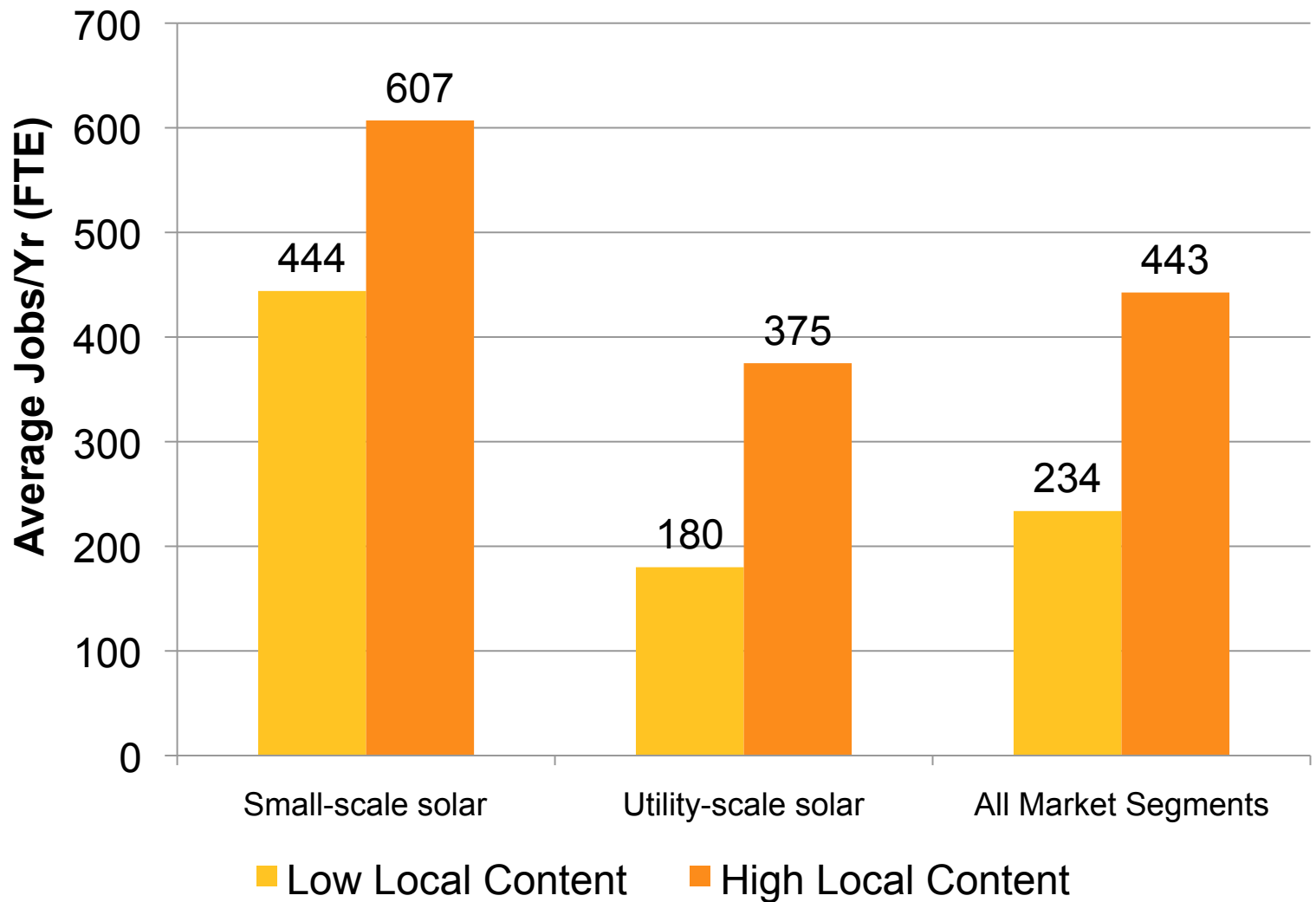


Low Local Content

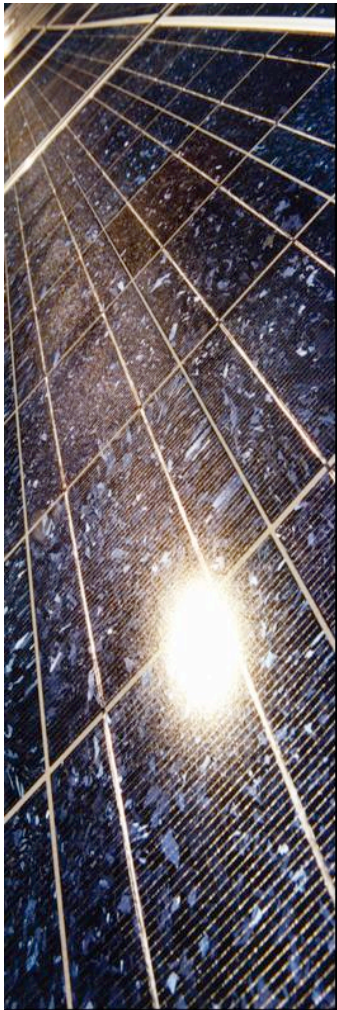


High Local Content

Construction Period Jobs thru 2020

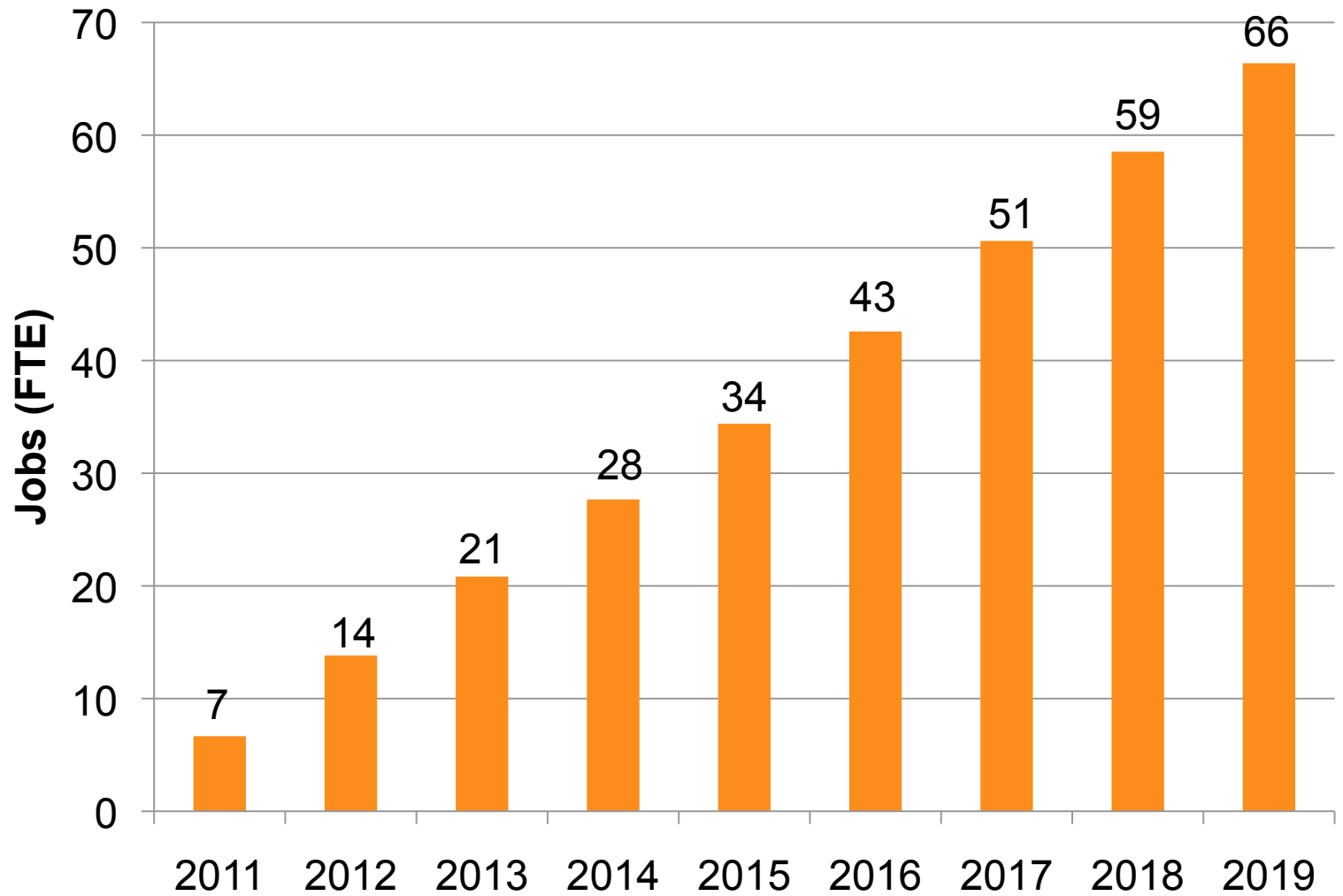


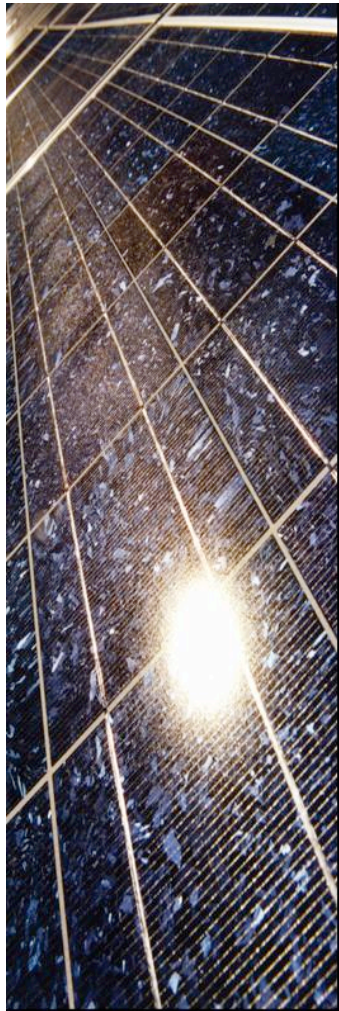
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O&M Jobs Supported per year



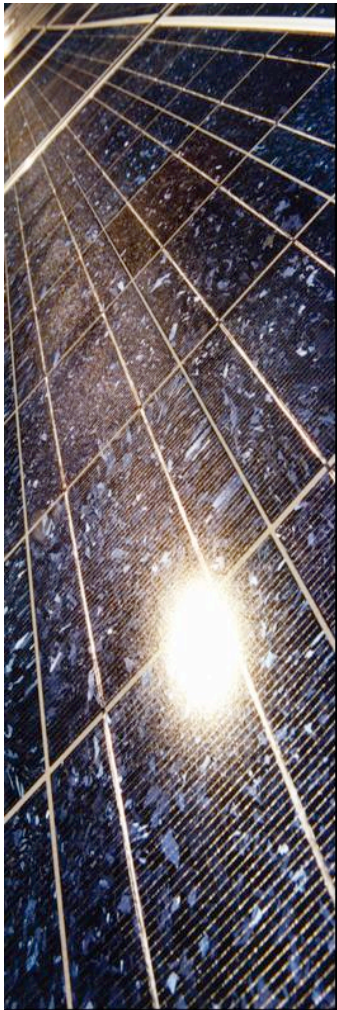


Earnings

Low Local Content	Total Benefits (\$2011)
Average Annual Earnings	\$15.5 million
Total Earnings through 2020	\$140 million
High Local Content	
Average Annual Earnings	\$30.7 million
Total Earnings through 2020	\$276.8 million

Economic Output

Low Local Content	Total Benefits (\$2011)
Total Output through 2020	\$304 million
Local Spending	\$176 million
High Local Content	
Total Output through 2020	\$681 million
Local Spending	\$417 million



Concluding Thoughts

- Compare generating technologies
- Compare JEDI analysis with other studies/data
- Formal JEDI report forthcoming
- Working w/ NREL to strengthen JEDI

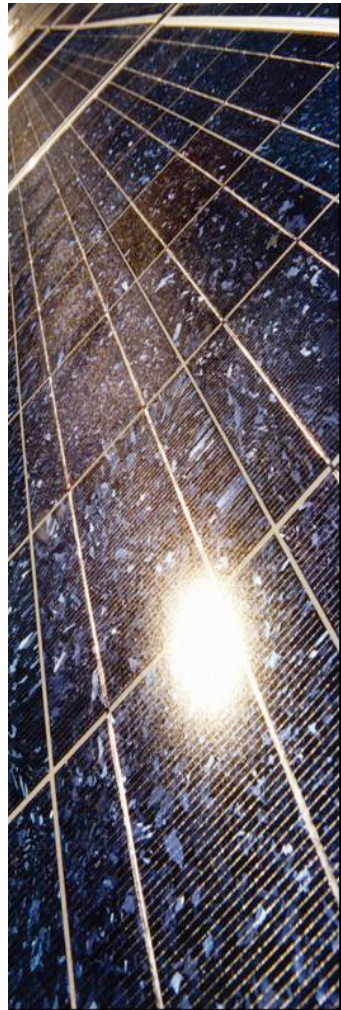


<http://implan.com/v3/>



<http://www.nrel.gov/analysis/jedi/>





Thanks!

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