



pennsylvania
DEPARTMENT OF ENVIRONMENTAL PROTECTION

Energy Programs Office



Policy Drivers and Government Incentives: Present and Future Commonwealth of Pennsylvania

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DEP Energy Programs Office (EPO)

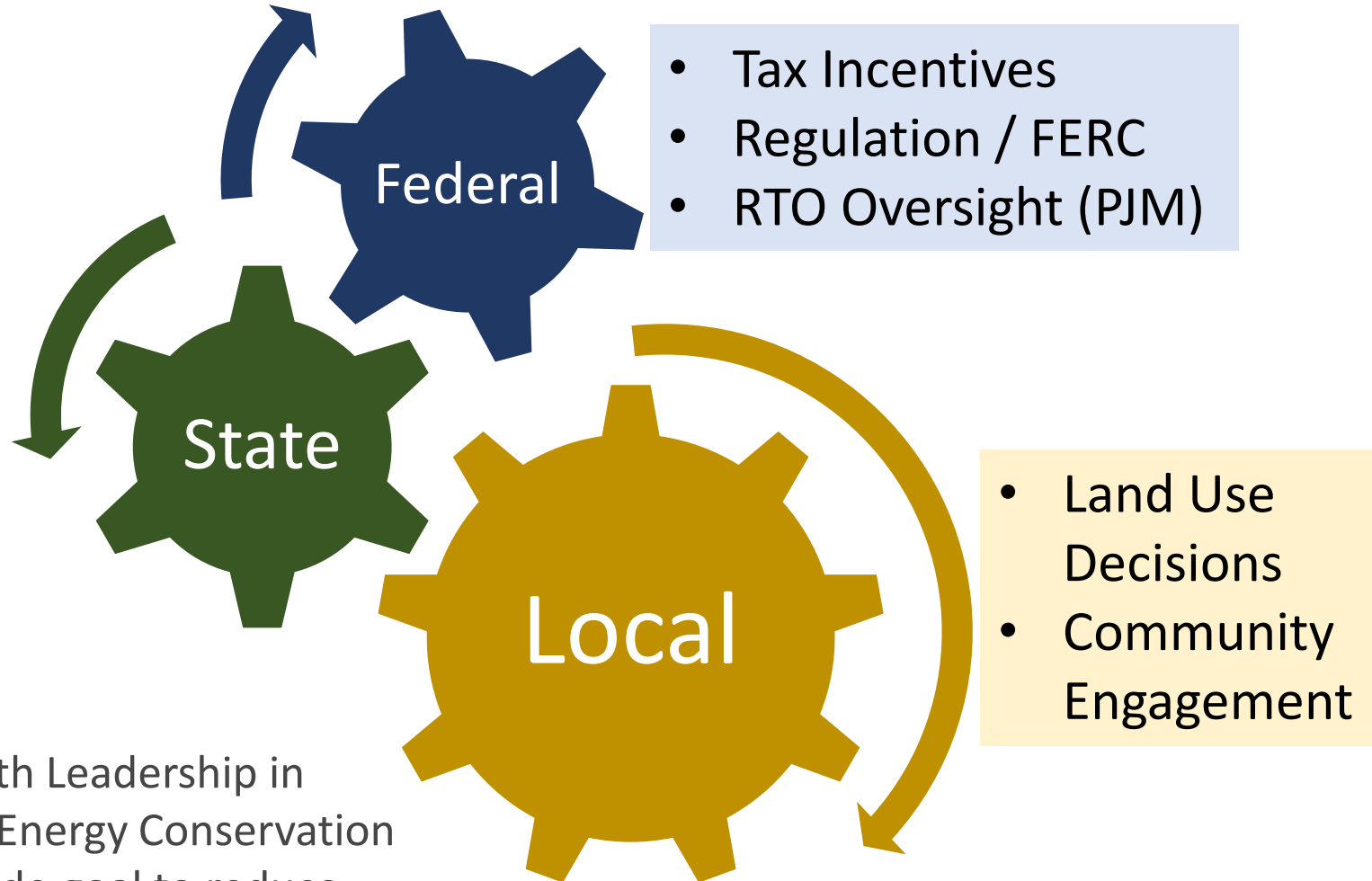


- EPO is the primary agency responsible for implementing clean energy programs in Pennsylvania.
- Responsible for supporting renewable energy, energy efficiency and conservation, climate change mitigation and adaptation, alternative transportation, energy assurance, and associated education, outreach and technical support efforts.

State Role in Grid-Scale Solar Development

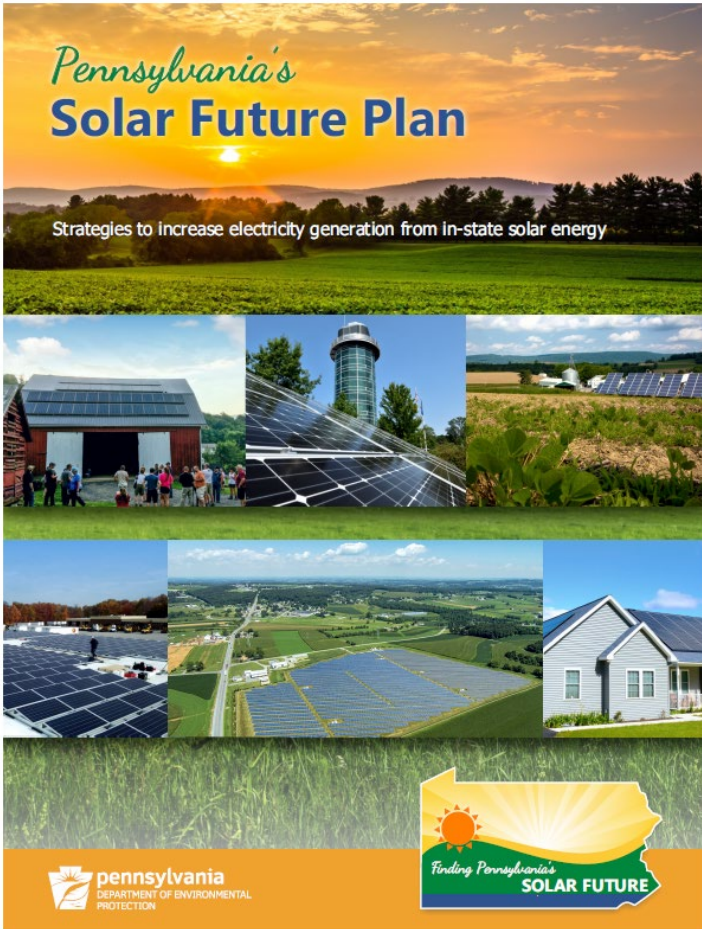
What is the State's Role?

Policy	<ul style="list-style-type: none">• Solar Future Plan• Executive Orders• Pending Legislation
Leading by Example	<ul style="list-style-type: none">• Power Purchase Agreement(s)
Coordination Across State Agencies	<ul style="list-style-type: none">• Land Use• Economic Development
Financial Assistance	<ul style="list-style-type: none">• None at this time



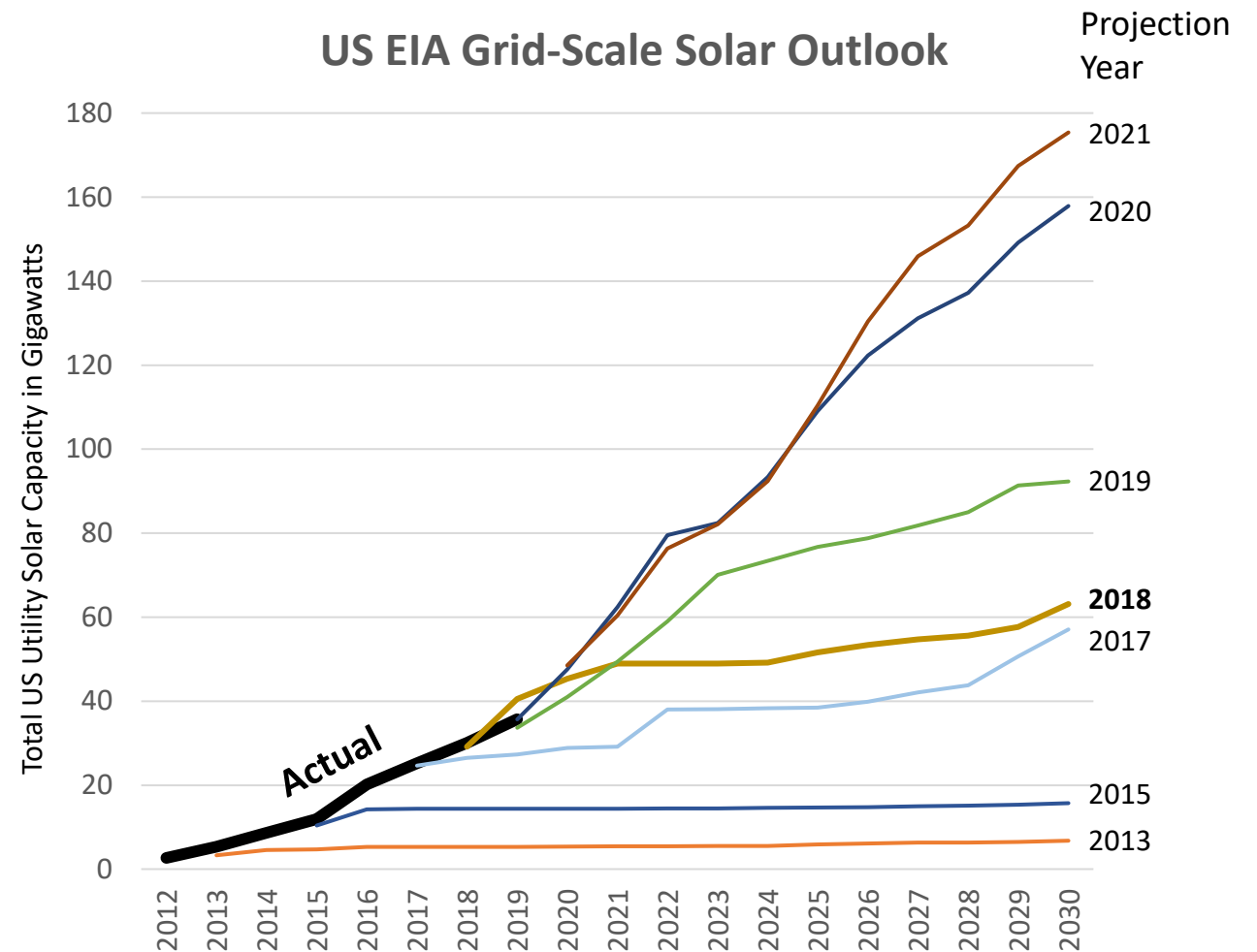
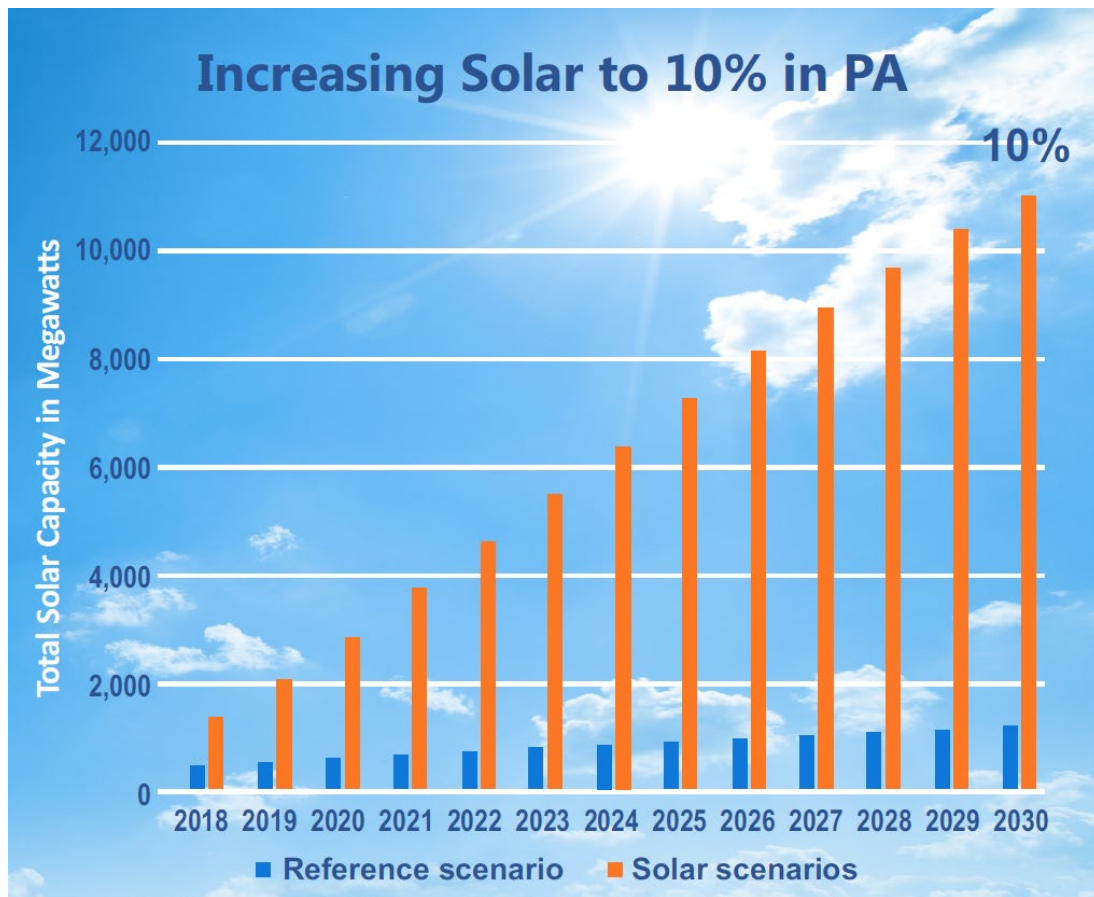
Executive Order No. 2019-1 (Commonwealth Leadership in Addressing Climate Change and Promoting Energy Conservation and Sustainable Governance) Sets a statewide goal to reduce greenhouse gas emissions 26% by 2025, and 80% by 2050.

Pennsylvania's Solar Future Plan



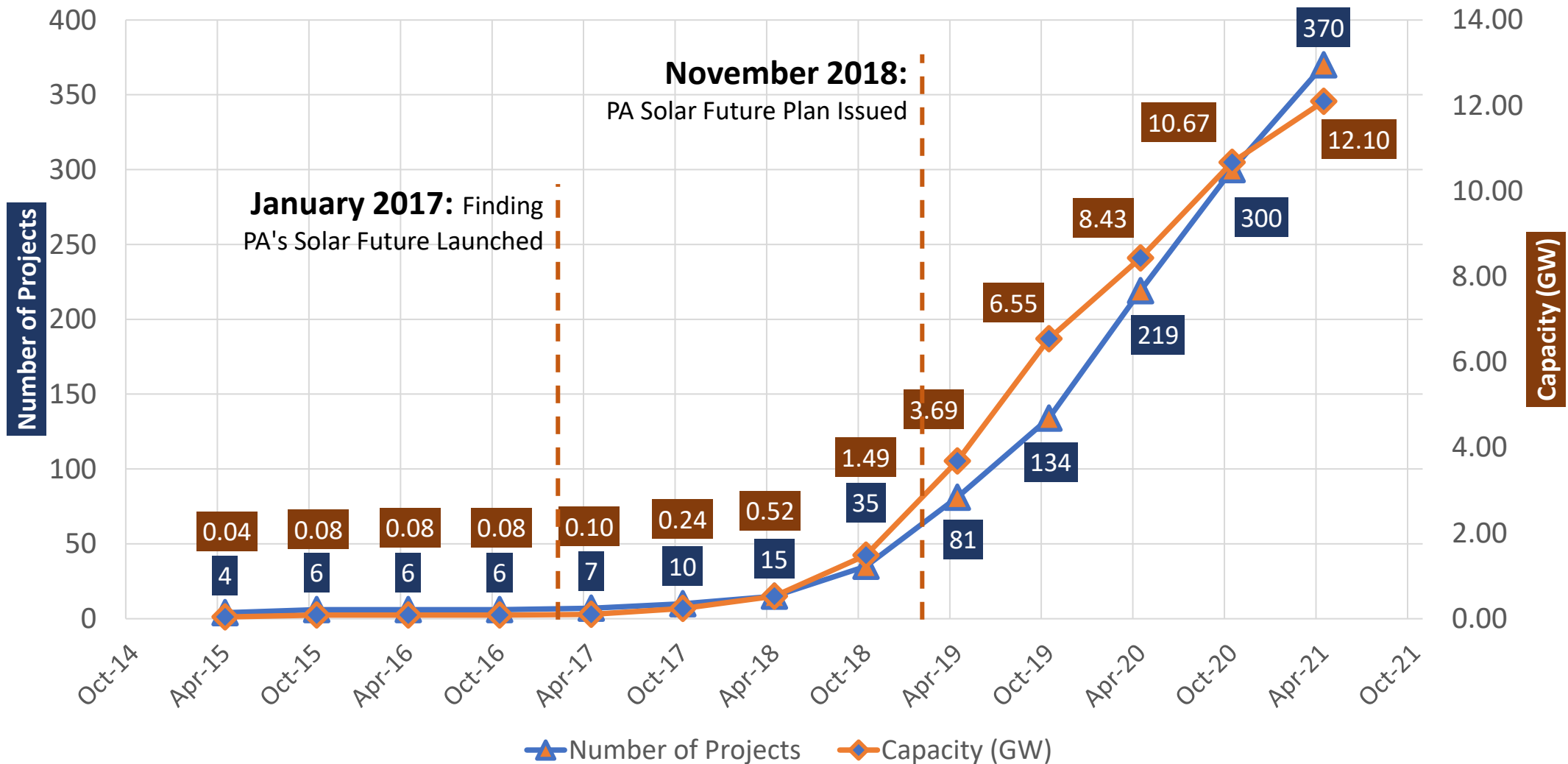
- Target 10% electricity (11 GW) from in-state solar by 2030 (currently less than 0.5%)
 - **Scenario A:** Grid-scale solar will supply 65% of the 10% electricity generation
 - **Scenario B:** Grid-scale solar will supply 90% of the 10% electricity generation.
- If 90% of in-state solar comes from grid-scale sources:
 - ~**10 GW** of solar generation
 - ~80,000 acres of land – this represents 0.3% of total land in Pennsylvania
- 15 Recommendations – 4 relevant for today's discussion

Projecting Grid-Scale Solar Deployment



Growth of Grid-Scale Solar Proposals

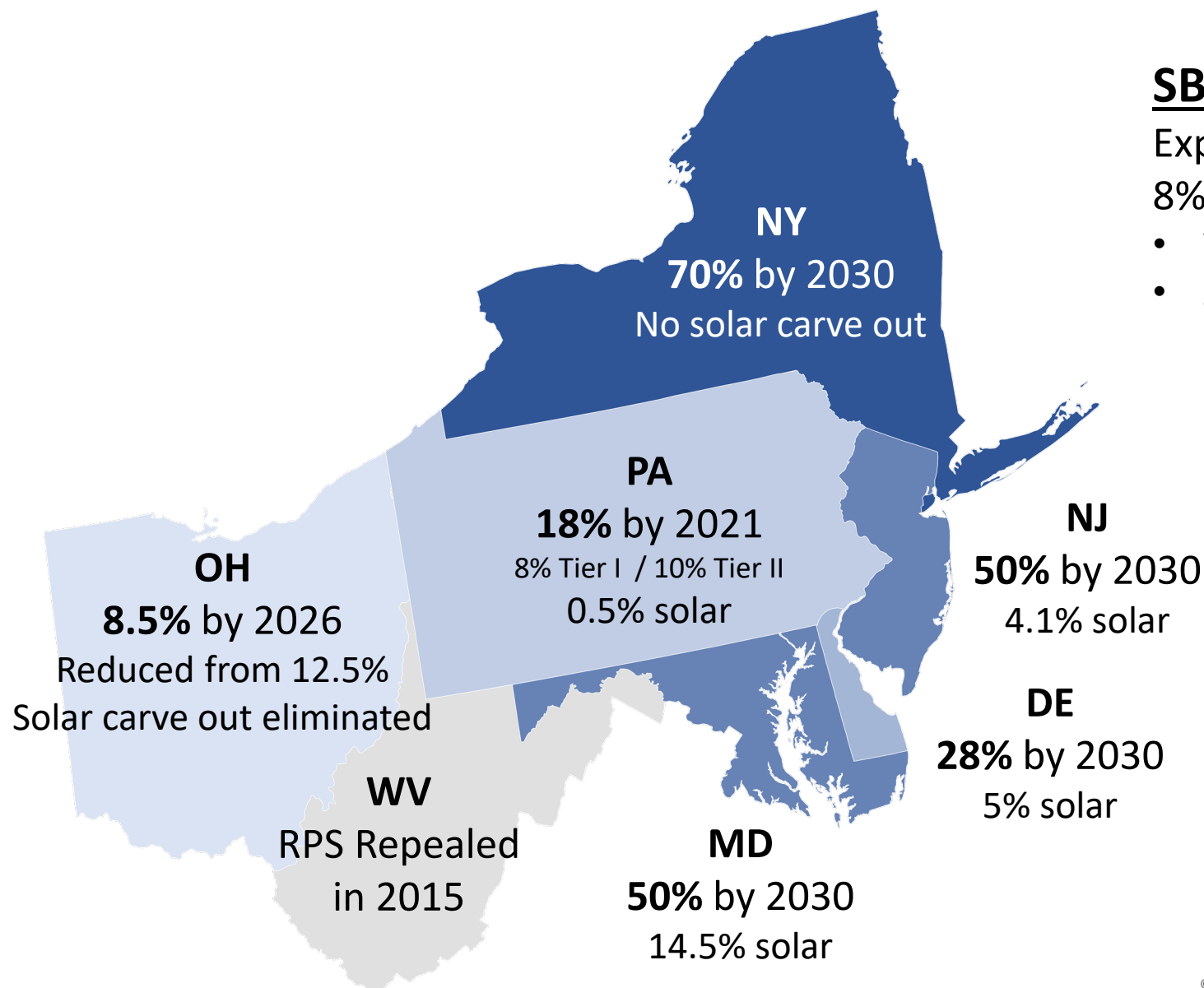
Projects in PJM New Services Queue in Pennsylvania



Solar Future Plan Recommendations

Alternative Energy Portfolio Standards	Increase the AEPS solar photovoltaic (PV) carve-out to between 4 and 8 percent by 2030 and ensure creditable Solar Renewable Energy Credits are limited to those generated in Pennsylvania wherever possible.
Community Solar	Identify and remove the barriers to the deployment of community solar systems in Pennsylvania.
Siting and Land Use	Support the creation and adoption of uniform policies to streamline siting and land-use issues while encouraging conservation.
Carbon Pricing	Implement a carbon pricing program and invest the proceeds in renewable energy and energy efficiency measures.

Regional Renewable Portfolio Standards



SB 300 introduced February 2021
Expands the AEPS Tier I requirement from 8% to 30% by 2030

- 7.5% for in-state grid-scale solar
- 2.5% for in-state distributed generation solar;

Solar Scale Continuum



Residential & Commercial

- For on-site energy use
- Rooftop or mounted adjacent to structure
- Measured in kW
- Considered accessory use system
- Mature market – available guidance

Community Solar

- For off-site energy use within community (distribution grid)
- Usually ground mounted requiring multiple acres
- Measured in 100s of kW up to 5 MW
- Considered primary use system
- Not yet allowed in PA (**SB 472**)

Grid-Scale Solar

- For off-site energy use distributed through transmission grid
- Ground mounted requiring significant acres to reach economies of scale
- Measured in MW
- Considered primary use system
- Emerging market – guidance in development

Leading by Example – Pennsylvania PULSE



PA pennsylvania **lightsourcebp** **Constellation.**
An Exelon Company

PENNSYLVANIA PULSE
FOR A HEALTHIER, MORE RESILIENT PENNSYLVANIA

Pennsylvania PULSE (Project to Utilize Light and Solar Energy) is a clean energy project comprised of seven new solar farms in six counties across Pennsylvania. In total, the 191 megawatt (AC) project will supply 361,000 megawatt-hours of electricity annually to 16 Commonwealth of Pennsylvania agencies, making it the largest solar commitment by any government entity in the United States.

The project supports the Commonwealth's commitment to mitigating climate change by reducing its carbon emissions, with power generation as a leading contributor to greenhouse gas emissions that negatively affect our environment and the health of Pennsylvanians. Pennsylvania PULSE will enable the Commonwealth to reduce its carbon footprint by 157,800 metric tons of CO2 each year, with new home-grown renewable energy projects that will bring health and economic benefits to Pennsylvania.

STATISTICS

- Capacity: **191** Megawatts (AC)
- Electricity Supplied: **50%** of the Commonwealth of PA's annual electricity consumption will be sourced from these new solar assets
- Construction jobs: **400** workers, the majority local Pennsylvanians
- Emission Reduction: **157,800** metric tons of CO2 per year

For each year, that's like removing emissions from ...

34,092 fuel burning cars, 

26,716 homes' electricity use, 

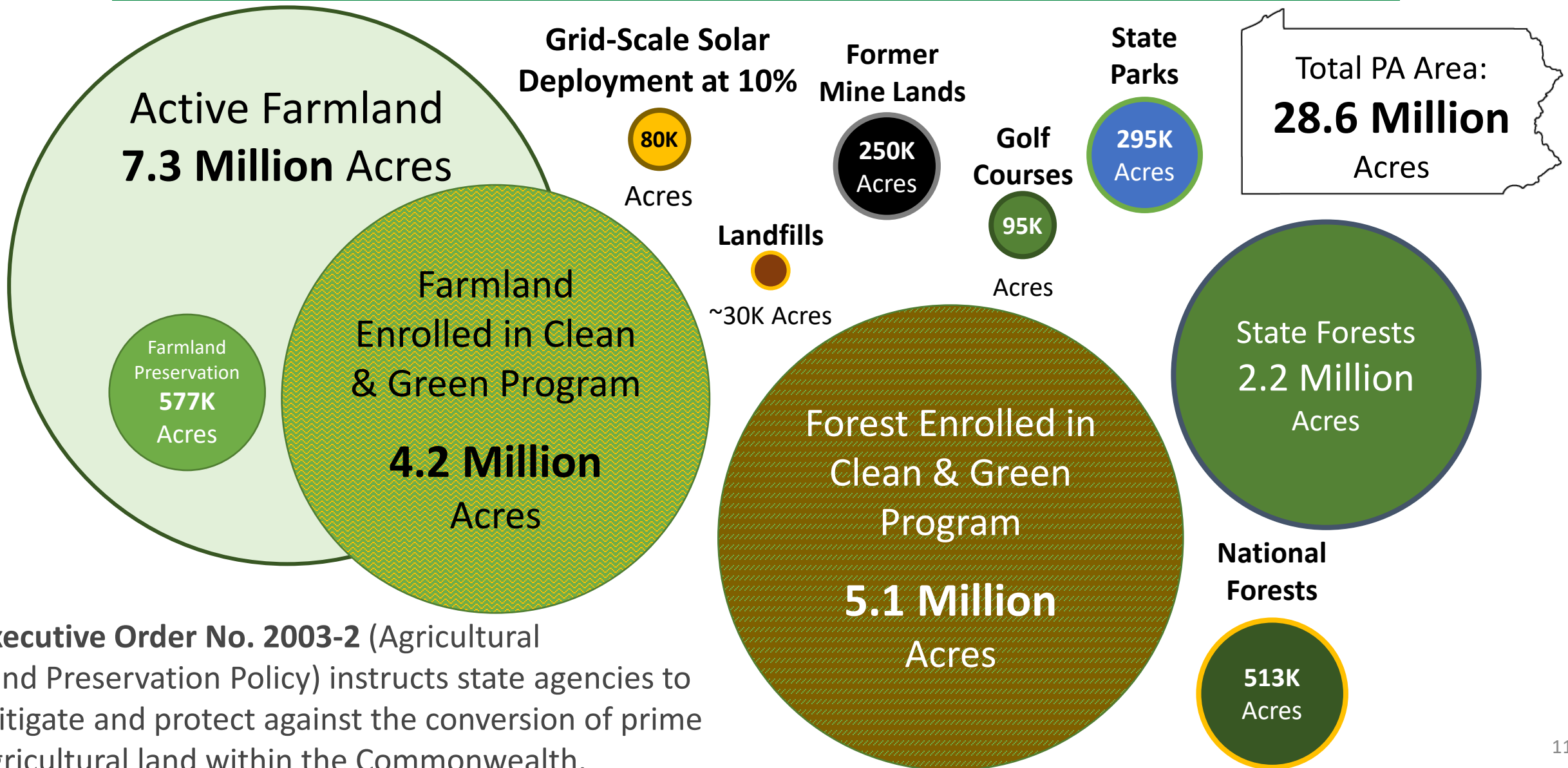
or charging **20 billion** cell phones. 

Responsible Solar  

Project to Utilize Light and Solar Energy

- Supply 50% of Commonwealth government annual electricity consumption
- **191 MW capacity** – over 7 sites in 6 counties
 - Used Nature Conservancy tool to confirm sites not located on high value biodiversity areas or wildlife corridors
- Largest solar commitment by any government entity in US
 - Rates competitive relative to historic rates for traditional grid power
- Coordinated by GreenGov Council

Land Use Comparison

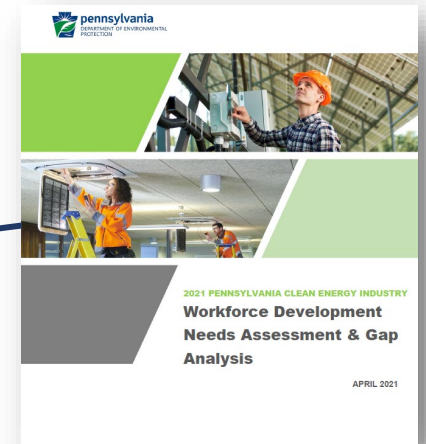
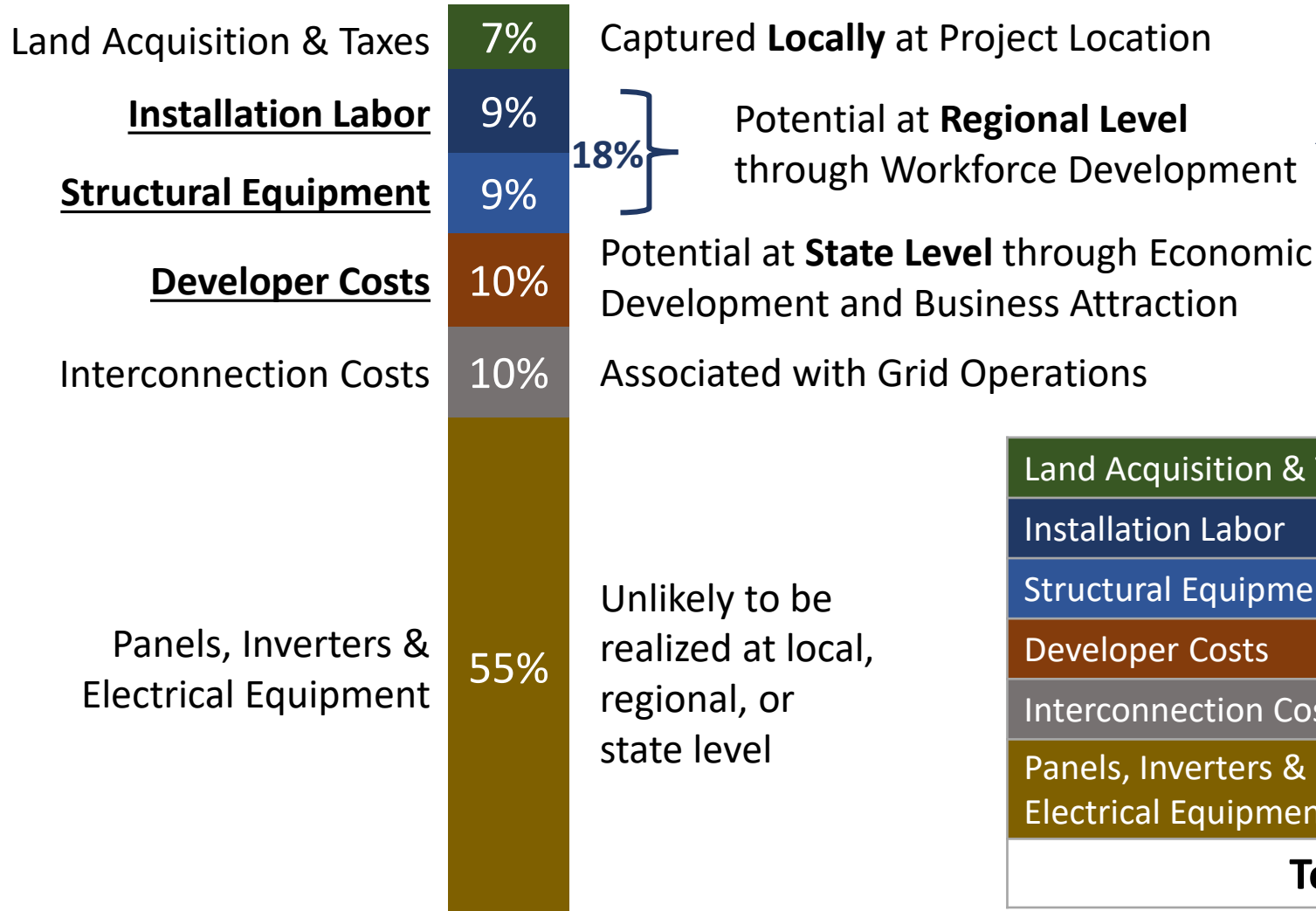


Land Use Topics to Examine Further

- Siting projects where they make most sense
 - Farmland and forest preservation
 - Use of abandoned mine lands and other brownfields
- Property tax collections impact
- Property value impact
- End of project concerns (decommissioning, recycling/disposal, restoration of land)
 - **SB 284** introduced February 2021 (bonding requirements for renewable energy projects)

Economic Development Potential

Estimated construction costs of \$1.13M per MW across the following categories:



	Single 20 MW Project	12.1 GW Statewide
Land Acquisition & Taxes	\$1.6 M	\$1.0 B
Installation Labor	\$2.1 M	\$1.3 B
Structural Equipment	\$2.0 M	\$1.2 B
Developer Costs	\$2.3 M	\$1.4 B
Interconnection Costs	\$2.2 M	\$1.4 B
Panels, Inverters & Electrical Equipment	\$12.4 M	\$7.5 B
Total:	\$22.6 M	\$13.7 B