

Testimony of Brent Alderfer
before the

House Environmental Resources and Energy Committee

Solar Energy and Economic Development

Monday, March 18th, 2024

10:00am – 12:00pm

Room G-50, Irvis Office Building

Chairman Vitali, Chairman Causer, and members of the Committee, thank you for the opportunity to testify today. I am founder and President of Community Energy, Inc., a Pennsylvania-based company that developed solar at scale across the country for ten years. I would like to present some facts about the economics and economic development opportunities presented by solar electric generation.

Solar generation can be developed at any scale from small residential roof-top systems to commercial size systems for large businesses, and larger grid-connected solar systems consisting of thousands of solar modules delivering power to the utility grid that serves all of us. Pennsylvania generates less than 1% of its electricity from all solar projects small and large. I will present a quick overview of the economics available from expansion of solar in Pennsylvania.

You have heard folks talk about payback for systems installed at their home or business. I want to talk about the economic benefits and payback from grid-connected solar, like that shown here on a farm south of Lancaster.



This fourth generation farmland on Lancaster Pike that would have been lost to development (which creates the largest loss of PA farmland every year). The first thing I want you to understand is that solar installed on any land, including farmland, preserves that land with private dollars for 25 years or longer and returns improved farmland at the end of that period. Solar installed as it was here, with posts driven into the ground like fence posts, without concrete foundations, without regrading or removing topsoil, and with plant cover of deep-rooted fescue or other grass, continuously improves the soil by lying fallow and

building soil organic content for 25 years. Project decommissioning bonds guarantee funds available to remove the mounting posts and modules, returning improved agricultural land to the next generation.

Whenever you see solar like this you know that land is being preserved without taxpayer dollars. Given the public benefit of banked farmland for the next generation it is actually unfortunate that the amount of land that would be leased to supply 10 percent solar electricity to PA is only about $\frac{1}{2}$ of 1 % of total farmland in the state. That is a fraction of the permanent loss of hundreds of thousands of acres of farmland to housing development.

Where views are a consideration, given the height of the panels landscape plantings can fit to the character of the area.



So, what about the economics? Starting with the landowner, the solar project typically leases the land with a lease rental of \$1000 to \$2000 per acre per year, paid consistently every year for the life of the lease, twenty-five years or longer. That's five or more times the revenue received from growing corn and beans. This assured income from the solar-leased portion of a farm provides a financial hedge to withstand crop commodity price swings and meet expenses for the balance of the farm.

We have spent about \$1.4 billion in federal, state and local tax dollars to preserve about 600,000 acres of farmland in Pennsylvania. The USDA pays farmers about \$100 per acre annually to take about 200,000 acres of farmland out of production in PA. By comparison, solar leasing delivers private sector dollars to pay farmers annually 10-20 times the USDA rate improving the farmland over a much longer period.

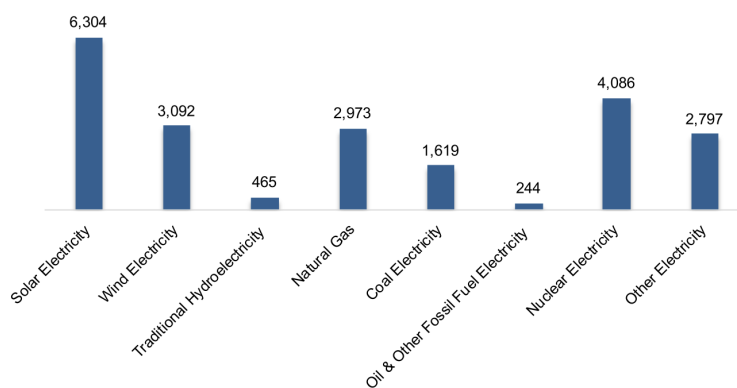
Tax revenues for local governments benefit from the same solar multipliers. Open land, whether preserved or not, pays relatively little taxes. The PA Clean-and-Green program abates local taxes to improve

the economics of farmland ownership. One assessment estimated the loss of tax revenues for two counties at \$30.2 million annually.

Development of solar projects to generate ten percent of PA electricity turns those numbers completely around. With that development, payments to landowners would total \$1.7 billion, and local tax revenues statewide would increase by just under \$500 million.

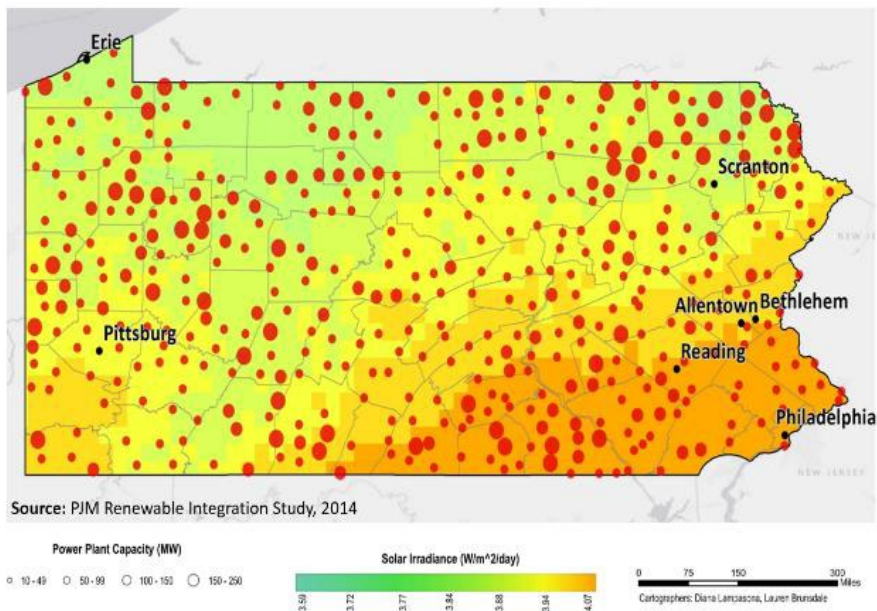
Jobs Solar produces more jobs per unit of electricity than any other source of generation. Even at less than 1% of total electric supply, the PA solar industry provides more jobs than other electric generation technologies.

Figure PA-2. Electric Power Generation Employment by Detailed Technology Application



Solar jobs are good paying jobs including electricians, surveyors, design and civil engineering, real estate, geotechnical, material procurement, distribution, construction, operation, and maintenance. Given the wide range of solar applications from small roof-top to large grid-connect projects, solar jobs are distributed across every county of the state. This map shows locations of potential solar installations from a study by PJM (the regional electric grid operator). Solar produces jobs throughout the state with no county left out.

Every Pennsylvania County Has Solar Potential



With expansion of solar at scale, job growth is extraordinary. Ramping up to 10% solar in Pennsylvania produces 75,000 new jobs and brings \$10 billion in new investment to the state.

Pennsylvania with its history of leading new energy technologies starting with coal and then oil a 100 years ago, nuclear 70 years ago, and natural gas over the last decades, is in a strong position to add still more jobs by bringing solar manufacturing to the state. Federal incentives for domestic content and manufacturing make this the opportune time for Pennsylvania to build manufacturing plants in the fastest growing energy segment globally.

Impact on Electricity Prices Grid connected solar at scale saves PA electric rate-payers money. All the costs of building solar are in up-front capital. Once solar generation is built there is no fuel and minimal operating costs meaning it produces virtually zero-marginal-cost electricity. Solar output is highest on hot summer days when grid hits peak demand and pulls on its most expensive peaker units to meet demand, significantly raising the price of power during those hours. By delivering more power at those peak times solar generation significantly suppresses high energy prices. Referred to as “peak shaving” or “price suppression,” this is not a new phenomenon and has been seen routinely in markets with higher percentages of solar. It is new for Pennsylvania because we haven’t had the level of solar necessary to impact the market.

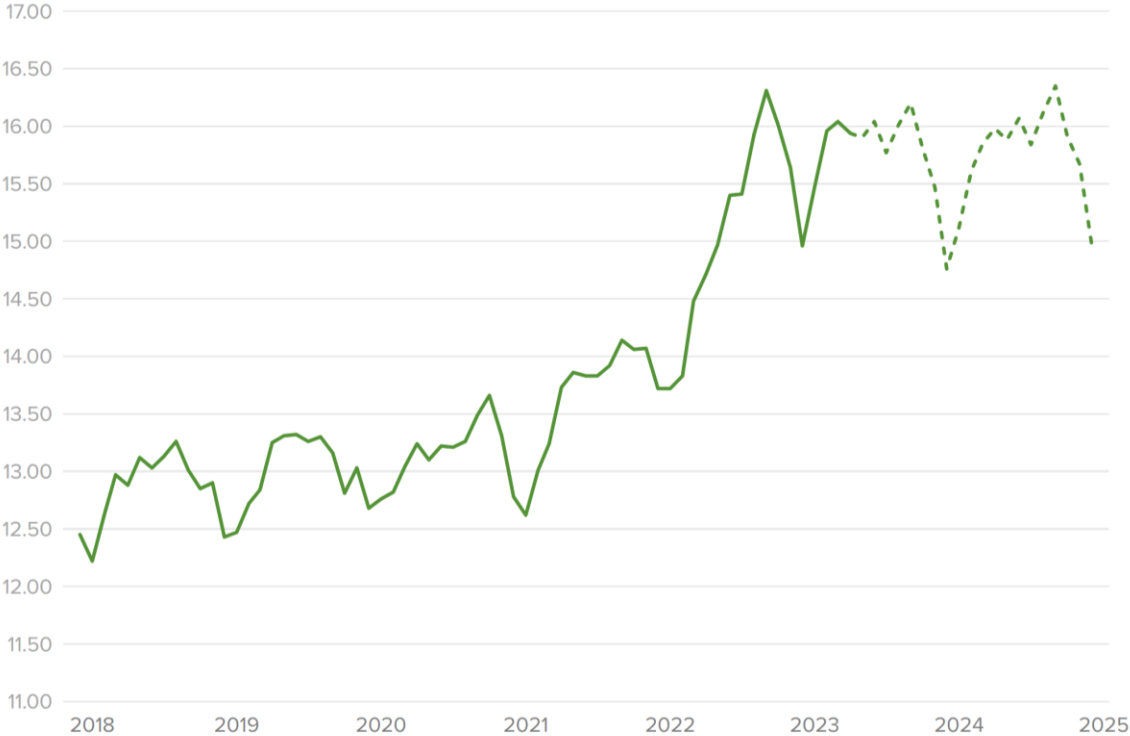
It is not difficult to quantify the savings from increased solar production during peak hours by running a standard PJM hourly unit-by-unit economic dispatch model to compare hourly wholesale energy prices with and without PA 10% solar. That dispatch model run confirmed that adding PA 10% solar to the grid will reduce overall wholesale energy costs for PA customers by about \$620 million annually. In other words, the upfront investment in building out PA solar at scale pays off in wholesale energy savings that more than cover the costs.

Thank you for the opportunity to present the current economics of solar electric generation.





Residential electricity prices

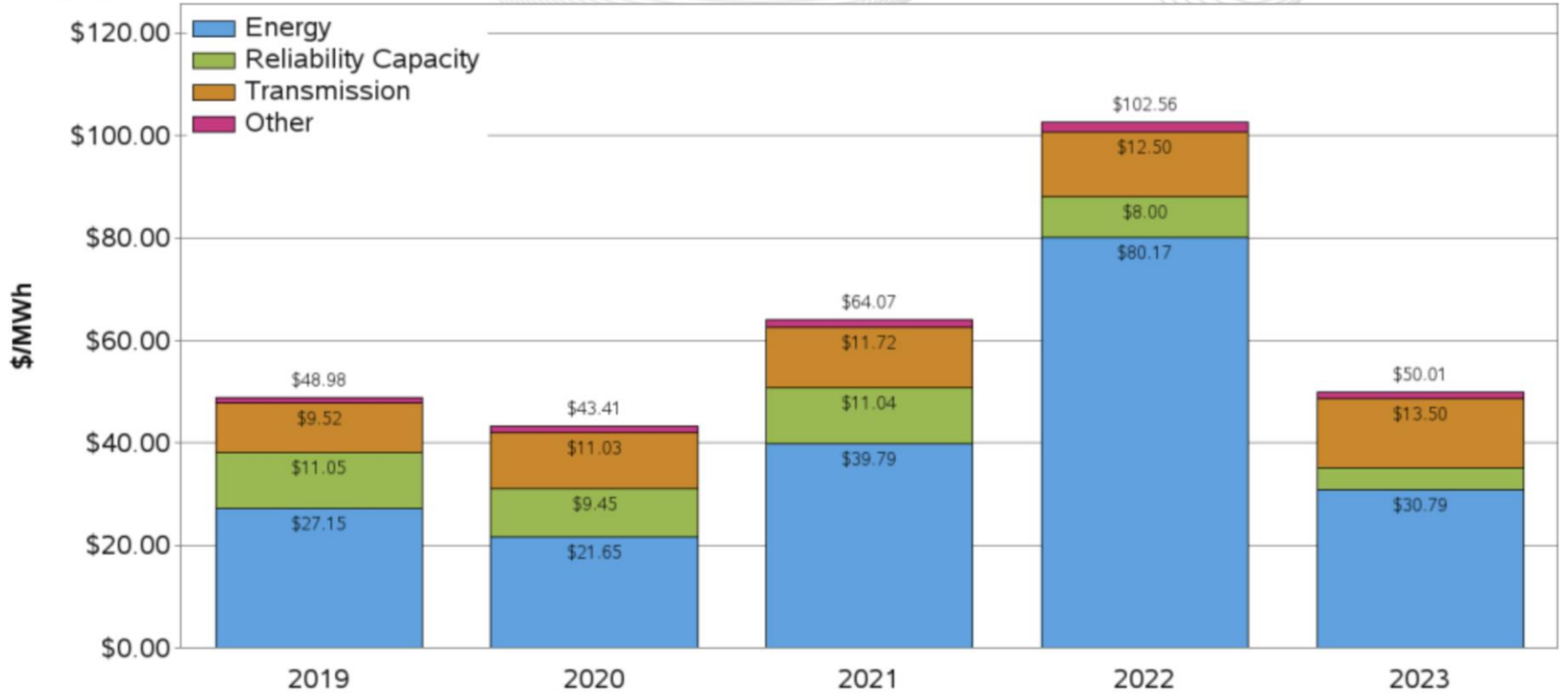


Cents per kilowatt-hour; U.S. average

Source: Energy Information Administration



PJM Wholesale Cost



PA Utility-Scale Solar -- Savings vs Cost

5% Solar By 2025

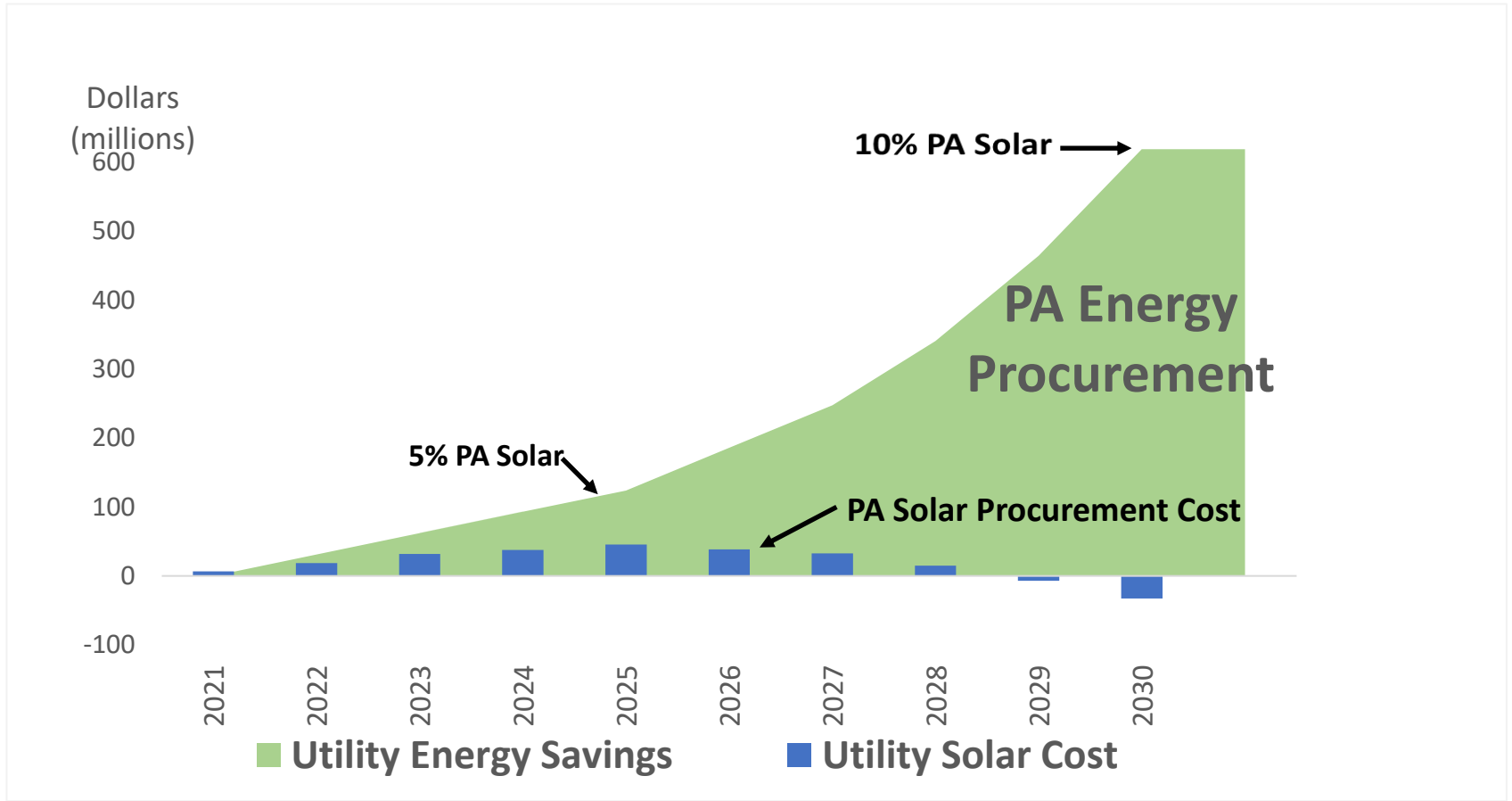
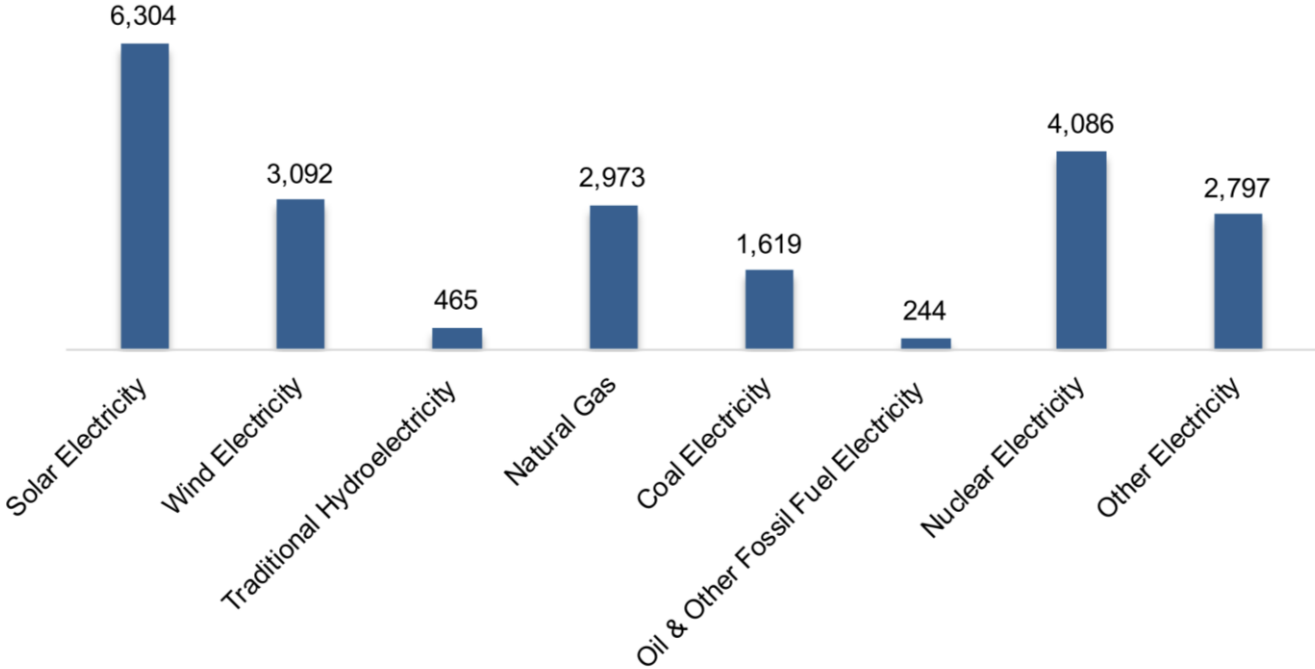
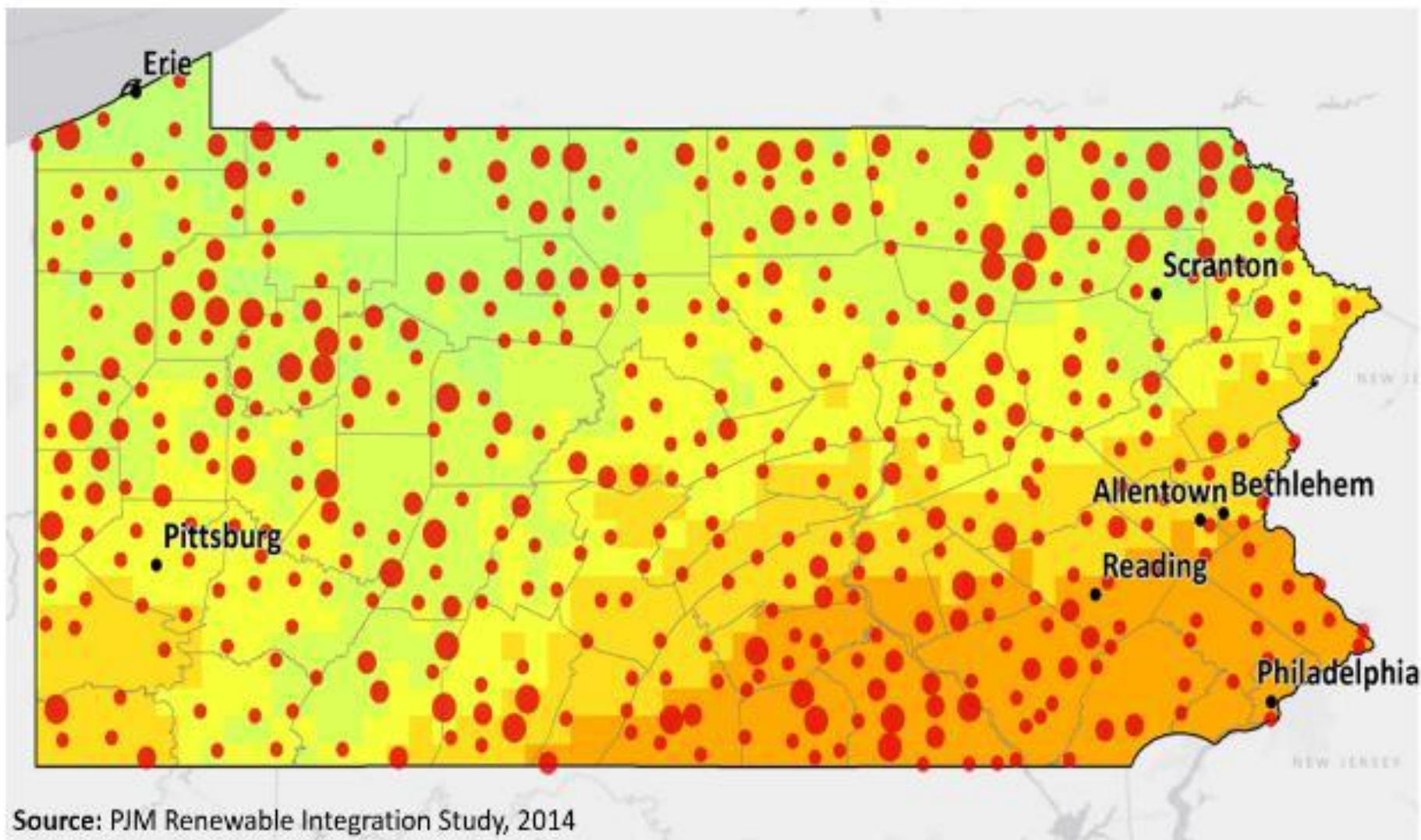


Figure PA-2. Electric Power Generation Employment by Detailed Technology Application



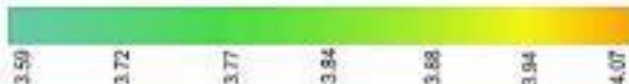
Every Pennsylvania County Has Solar Potential



Power Plant Capacity (MW)

○ 10-49 ○ 50-99 ○ 100-150 ○ 150-250

Solar Irradiance (W/m²/day)



0 75 150 300 Miles

Cartographers: Diana Lampasona, Lauren Brunskale

State-wide Economic Growth at 10% PA Solar

- \$10.3 Billion in Private Capital Investment
- \$5.5 Billion in Local Economic Benefit
- 75,682 Total Jobs
- \$3.2 Billion in Total Wages
- \$1.7 Billion Farmer Lease Payments
- \$481.4 Million Local Tax Revenue

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