



Testimony of Brent Alderfer, CEO and Founder
of Community Energy, Inc.
for the
PA Senate Consumer Protection and Professional Licensure
Committee

Chairman Tomlinson, Chairman Boscola, and members of the Senate Consumer Protection and Professional Licensure Committee, thank you for allowing me the opportunity to testify today. We are a Pennsylvania-based company that has developed wind and solar at scale across the country. I would like to present some facts about solar generation for your consideration.

Economics The most significant fact about solar electric generation is that the cost of solar generation has come down more than 70% since 2010. [Slide 2] The cost declines have come from technology that produces more electricity from each module, new tracking systems that allow the modules to track the sun throughout the day like a sunflower from east to west extending the hours of production into the late afternoon when power is needed most, more efficient installation with prefabricated wiring harnesses and other standardization, economies of scale on large solar systems, which are reflected in the lower curve on the cost chart, and finally reduced cost of capital as solar has proven 25-year reliability under commercially accepted 25-year warranties.

Most important from an economic development point of view even after achieving those efficiencies solar still produces more jobs per

unit of electricity than any other source of generation—by a wide margin. Solar jobs are good paying jobs including electricians, surveyors, design and civil engineering, real estate, geotechnical, material procurement, distribution, construction, operation and maintenance. Ramping up to 10% solar in Pennsylvania produces 75,000 new jobs and brings \$10 billion in new investment to the state.

Solar is unique in offering generation technology that produces power from roof-top installations on homes and businesses all the way up to grid-scale power systems delivering hundreds of megawatts of wholesale power to the utility grid. As a result, solar jobs are distributed across every county of the state. [Slide 3] This map shows locations of potential solar installations from a study by PJM (the regional electric grid operator) evaluating integration of 30% renewable generation onto the electric grid. Solar works throughout the state with no county left out.

Impact on Electricity Prices Solar electricity is not yet the lowest cost generator in the fleet and will require a solar renewable energy credit to finance build out of PA solar generation in the near term. But solar is now also not the most expensive. After the upfront investment to build solar the incremental cost of each kilowatt hour is minimal, which brings some interesting cost saving to energy prices overall. Here is how. [Slide 4] The economic dispatch chart for the generation fleet in the PJM grid serving Pennsylvania and surrounding states shows that as demand rises on a given day wholesale energy prices need to rise to bring the higher-cost fossil-fuel and peaking generation units on line. This is basic supply and demand and as you would expect paying for these more expensive units during times of high energy demand drives up the market clearing price for every megawatt used during those peak demand hours. Solar has the opposite effect on market price. By producing more power during hot sunny days when demand is highest, with no additional fuel or

operating cost, solar generation suppresses higher energy prices during times of peak demand reducing the cost of electricity during those key hours. Sometimes called “peak shaving” or “price suppression,” this is not a new phenomenon and has been seen routinely in markets with higher percentages of renewables. It is new for Pennsylvania because we haven’t had that level of solar to impact the market. But 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. We recently commissioned that model run and confirmed that adding PA 10% solar to the grid will reduce overall wholesale energy costs for PA customers, all other things held constant, by about \$620 million annually. In other words, the upfront investment in building out PA 10% solar pays off in wholesale energy savings that more than cover the costs.

To keep the upfront cost of building out PA solar as low as possible the most important legislative provision is one that authorizes and directs utilities to purchase their solar requirements through competitive procurements of long-term supply contracts. The reason is simple. Solar generation is all capital, with no fuel cost, so the lower the cost of project capital, the lower the price of solar electricity. Without long-term supply agreements PA solar project revenue comes from short-term sales of energy and renewable energy credits, which are volatile and have traded as high as 30 cents per kwh and as low as a 1/2 cent per kwh. Project capital forced to accept that risk of not getting paid back, is costly with high interest rates to compensate for the risk. Just as 15 and 30-year home mortgages are necessary to repay the upfront cost of a home, 15 and 20-year utility contracts are necessary to assure repayment of the upfront cost of a solar project. Competitive procurement of solar under long-term purchase agreements assures the lowest cost capital for solar projects and cuts

the required solar renewable energy credit cost in half, all of which savings flow directly through to electric customers.

Land Use Probably the biggest misunderstanding on solar is that it will use up farmland. In fact, solar is the best farmland preservation tool available. Here are the numbers. To get to 10% PA solar, 1/4 of the solar will come from customer sites – homes and businesses – and 3/4 will come from larger-scale grid-connected solar projects delivering power into the transmission grid. Those projects will lease about 50 to 60,000 acres of land by 2030 to produce electricity. That is less than 1% of the 7 million of acres of farmland in the state. By comparison there is about four times that amount, 200,000 acres in abandoned mine land in PA.

[Slide 5] Pictured is a solar project we developed off Lancaster pike south of Lancaster, shown from aerial and street view. In the family for generations this farm was under the same economic pressure that has taken many farms in Pennsylvania. A solar project pays rent at 4 to 5 times the annual income from farming, guaranteed for twenty-five years, and the land stays in the family. We install the posts and racking without grading or removing topsoil and without concrete foundations. Cover crops like deep-rooted fescue grass or more recently pollinator friendly cover crops improve the organic content and richness of the soil year by year as the farmland lies fallow and the solar panels deliver power to the transmission grid. At the end of the 25-year lease, backed by a decommissioning bond, this farm family can count on removal of the solar equipment, right down to pulling the posts out of the ground, and return of improved farmland to the next generation.

A quick look at other farmland preservation tools shows the advantages of solar leasing. We have spent about \$1.4 billion in

federal, state and local tax dollars to preserve about 600,000 acres of farmland in the state. The USDA under the conservation reserve program pays farmers annual market rent recently set at \$82 per acre to take about 200,000 acres of farmland out of production in PA, part of 25 million acres nationally. Our PA clean-and-green program abates local taxes for farmland to improve the economics of farmland ownership. [Slide 6] A Morning Call article recently estimated the loss of tax revenues for two counties in that part of the state to be \$30.2 million annually.

[Slide 7] PA 10% Solar turns those numbers completely around. It uses private sector dollars to pay farmers 10 times the taxpayer-funded USDA rental to take farmland out of production. Solar generation will pay a total \$1.7 billion to farmers, and rather than abating local tax revenues, will increase local tax revenues by \$481 million.

In summary, PA 10% solar is economically a PA jobs and farm bill and environmentally a PA climate change bill, hedging both energy costs and environmental risks.

Thank you for the opportunity to present some of the facts on solar electric generation.