

Subject: Transource Power Line

Consider the history of the last 30 years (1990 to 2019)

In the 1960s and 70s the utility industry was experiencing growth in demand and was building transmission facilities and new power plants including nuclear plants to meet the anticipated demand. This period capped a span of almost 80 years of steady growth in grid demand.

Thirty years later, in 1992, the Energy Star standards were introduced. Based on those standards manufacturers quickly began building much more energy efficient appliances of all kinds. By 2000 the Energy Star standards began reducing the demand for grid power from the residential sector of the economy. Every time a homeowner replaces an appliance their home becomes more energy efficient.

Rooftop Solar power was introduced in the early 2000s. The Federal Energy credit of 30% was introduced and is still in effect. Many states also began offering rebates and credits to homeowners for Rooftop Solar installations. These rebates and credits raised Pennsylvania to be the 3rd fastest growing state for Rooftop Solar Installation in 2011 and 2012.

Research and Development combined with a surge in demand for solar panels has resulted in panels increasing in output from 230 watts in 2010 to more than 350 watts in 2018, an increase of 52%, while panel prices have dropped from \$7.15 per watt to less than \$3.50 per watt, a reduction of 51%. Rooftop Arrays introduce energy into the grid at an efficiency of better than 98%, making the overall grid more efficient. Rooftop arrays also further reduce the demand for grid power.

In the 2010 decade we are seeing a further reduction of the demand for grid power because of changes in lighting technology. Incandescent bulbs are being replaced by CFLs and LEDs. LED lighting is almost 10x more efficient than incandescent lighting.

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Most of the energy dissipated in an incandescent bulb is in the form of heat (It is too hot to touch). In the LED the energy dissipated is in the form of light. Our homes are requiring less energy for lighting now as well as for appliances. Setback thermostats and other energy control devices reduce our need for energy even further.

In construction we have gone from 2x4 framed walls to 2x6 framing. That resulted in an upgrade in the wall insulation from R-11 to R-19 if you use batt insulation. The change meant that a wall that was once an equivalent R-8 insulated wall is now an R-13 insulated wall. But foam insulated walls are now available and much better. A Structural Insulated Panel wall has no wood at all and so can become an R-32 wall using urethane foam. Heating and Cooling bills for the home decrease dramatically resulting in even less demand for grid power.

But there is more in the Pipeline.

Research at MIT shows efficiencies in solar cells improving from the high teens currently to the mid 20% range and with further improvements possible beyond that using other materials.

Battery technology as a result of the developments in the EV automobile industry can be expected to offer backup battery arrays for rooftop solar that will easily store the power needed for night time home power demands of 2 or 3 days. Night time power demands are already low because of setback thermostats, LED lighting, and the Energy Star standards.

There are current housing developments in several states of NZE (Net Zero Energy) homes that incorporate many of these ideas in every home in a community. We are talking about a community that might propose to be "Off the grid entirely".

The technology transformations that occurred in the early 1900s in automobiles, that occurred with the REA (Rural Electrification administration) under FDR, the development of the Apple I by the two Steves in 1977 that transformed the computer industry, the introduction of the iPhone, and then the iPad; all of these have

transformed our lives. And Energy Efficiency is now transforming our energy lives and dramatically disrupting the business model of the utility industry.

The reduction in energy demand plus the addition of Rooftop Solar means we no longer have a need for any additional long distance transmission except for large utility generation scale facilities such as wind farms or utility scale solar arrays. Power plants are now being retired including large nuclear plants.

Is it fair to disrupt the operations of farms that will lose some of their land for planting and will result in farming inefficiencies because they can no longer plant and cultivate efficiently if a utility transmission line is run down the middle of the farmer's land? This disruption will be for ever, for eternity. Is it fair to reduce the value of a residential property by 20 to 40% because a transmission line suddenly appears in the homeowner's backyard? If the bank asks for additional collateral because the mortgage is underwater will Transource or PJM advance the funds to the homeowner?

There are currently more than 22,500 Rooftop Solar arrays in Pennsylvania comprising 399.6 MW of power, and that power is more than 98% efficient, better than the efficiency the grid can supply. There are currently more than 63,100 Rooftop Solar arrays in Maryland comprising 1006.9 MW of power, and that power is also more than 98% efficient, better than the efficiency the grid can supply.

The Transource Transmission Line will be obsolete before it is ever completed and ready for service. All the current technology trends in the energy industry argue for no more additional high voltage transmission. It is past the time that this project should have been cancelled. Cancel it.

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