Policy Brief
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# A POLICY AND SYSTEM DESIGN BLUEPRINT FOR LOCAL POWER NETWORKS: LOCAL SOLAR FOR RELIABLE, ACCESSIBLE, AFFORDABLE ELECTRICITY

## by June SEKERA

**Reasons to Launch Local Power Networks:**

Local Power Networks are a structure for harnessing technology change to the advantage of households and communities. Municipal utilities and electric co-ops can use this structure and embed it in a local "solar saturation strategy", taking a "wholesale" approach to achieve economies of scale and lower costs.

Reasons for **public policymakers**.....***to finance*** **and support LPNs**

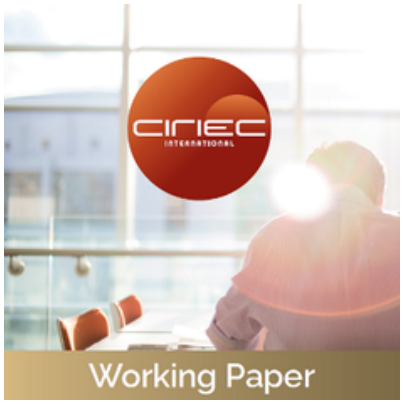
- Expand the population who can participate in zero carbon electricity and benefit from affordable electricity.
- Avoid building new transmission lines.
- Eliminate conflicts over utility-scale solar and wind farms and transmission lines.
- Decarbonize more rapidly than with centralized generation and transmission.
- Provide more secure electricity for public services.

(Additional) Reasons for **publicly-owned utilities and co-ops**.....***to set up*** **LPNs**

- Reduce reliance on volatile markets and high peak prices; less expensive source of electricity.
- Decarbonize more effectively and more efficiently (generation & storage are close to load).
- Supply power for public services during grid outages, e.g., cooling centers (summer) or warming centers (winter).

Reasons for **people, communities and small businesses**...***to be*** **in LPNs**

- Energy security - no loss of power during lengthy grid outages.
- Lower cost (relative to most private utility billing).
- Choice and control: decisions are made locally, by user-owners, not by remote corporations.




### US Context

Early in the era of electric power generation, local self-generation and municipal utilities predominated. It was only after corporate conglomerates displaced local generation and we entered the era of centralized, commercial electricity supply that the industry was deemed a "natural monopoly" that required government regulation to attend to consumer interests. When fossil fuels are the energy source, centralized generation can be justified on thermodynamic efficiency grounds. But when solar is the energy source, centralized generation, with its requirement for long-distance transmission, is no longer justifiable thermodynamically or economically.

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The current generation and supply system from which most Americans get their electricity is market-based and optimized for profit generation for corporate electricity suppliers, energy traders and other large players in the energy sector. Under this system, electricity is expensive and getting more so. 27% of U.S. households experience energy insecurity, sometimes foregoing food and medical care to keep the power on. All electricity customers are at risk for outages, which are becoming more frequent and longer, whether caused by severe weather, wildfires or the aging and decaying infrastructure of centralized generation and transmission,

It is time for a return to local generation for self-consumption – an approach that makes sense thermodynamically and that can supply non-carbon, affordable, accessible and reliable electricity to the smaller players, whether individual households, small businesses, or local or remote communities. This approach is especially well-fitted to publicly-owned and cooperative electric utilities.

This Policy Brief presents an overview of the contents of the Blueprint for Local Power Networks (LPNs).

The LPN project studies the feasibility of decentralized, locally-owned networks of solar photovoltaic (PV) electricity generation to increase energy access, lower costs and expand the supply of clean, renewable energy. The project is housed at the Global Development Policy Center at Boston University. Local Power Networks are mini-grids, locally-owned and operated, with a network-level power-pooling capability that enables self-sufficiency and increases energy security.

The Blueprint lays out the system design and policy framework to create these solar-powered networks in communities across the country. These locally-owned and -operated mini-grids have generation and storage at both the individual building level and at a shared "Reservoir". Through this design, entire neighborhoods can operate in "island" mode most of the time, with the grid serving as a backup power source – a reversal of existing practices in which microgrids are standby systems to be used in emergencies. The Technology Design section of the Blueprint explains the components and operation of the network, and the means by which non-commercial power pooing takes place. The Institutional Design section presents options for non-profit and public ownership and operation of LPNs within existing regulatory structures. The Financial Design section draws on the experience of other countries to lay out an approach to significantly reduce the cost of solar self-generation for self-consumption. Local governments and publicly-owned utilities are particularly well-positioned to use their authorities and powers to implement a local solar saturation strategy.

**Specific issues: "Distributed energy resources" (DER) or distributed denial of access (DDA)?**

The term "distributed energy resources" (DER) has become the catchphrase among promoters of a new business model for electricity commodification and the expansion of profit-taking by the technology sector.

Prior to DER, the emerging concept in the sustainable energy community was DRE – distributed renewable energy -- which referred primarily to local solar (or wind) generation and battery storage. But corporate energy interests, large tech companies and commercial distributed energy promoters soon awakened to the possibility that distributed "resources" could go beyond local generation and storage, and, in addition, allow actors in the energy supply system to manipulate energy consumption and generation, presenting new opportunities for price arbitrage and new avenues for profit generation.

Thus, DRE was replaced by DER, a term that now refers to a variety of electronic devices which enable third parties to manipulate residential consumption (e.g., heating or cooling systems, EV charging times) and allows utilities to drain home batteries at times of their discretion.

In internet use there is a situation called DDS – "distributed denial of service"—in which a malicious attack on a server crashes a website so it cannot be accessed. The technology giants' vision of commercial DER might more accurately be called DDA – distributed denial of access.

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