

# State of Play on Renewable Energy

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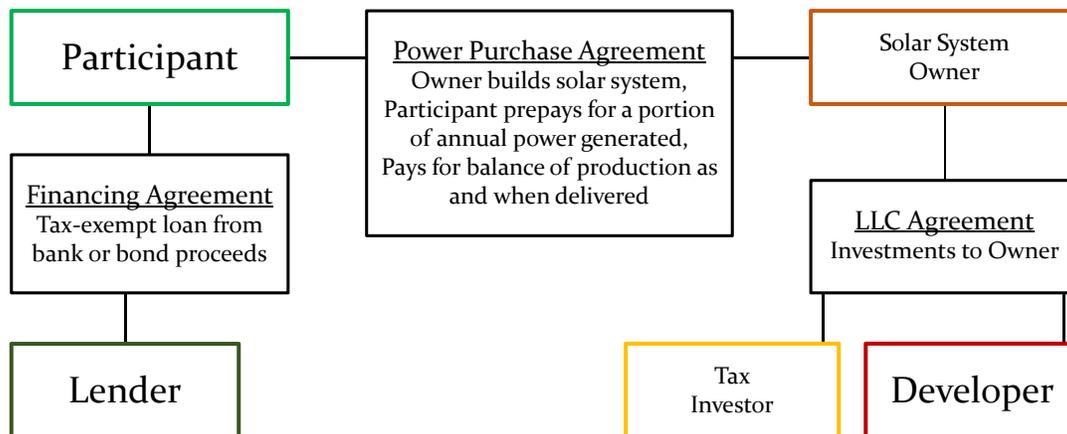
## Renewables Finance in the MUSH Sector

**PennSEF** is a partnership of the Treasury Department and the Foundation for Renewable Energy and the Environment to develop prudent, market-based investment vehicles that promote energy and water efficiency, clean energy generation, and environmental protection.

PennSEF accomplishes this by providing:

- low-cost financing for energy efficiency and alternative energy projects that offer conservation savings guaranteed to equal or exceed their related installation costs
- technical assistance and expertise to support project participants through selection of qualified contractors, adopting fair contracts, and implementation and monitoring of conservation measures.

## PennSEF Solar Program



## The Microgrid

A microgrid is a local electric system (**a local control area**) or combined electric and thermal system:

- that includes retail load and the ability to provide energy and energy management services needed to meet a significant proportion of the included load on a non-emergency basis
- that is capable of operating either in parallel or in isolation from the electrical grid
- that, when operating in parallel, is capable of providing energy, capacity or related services to the grid

Microgrid Resources Coalition

## Why Microgrids?

- Resilience
  - All resilience is local
  - Compare to FERC/DOE
- Internal efficiencies and arbitrage
- Reduced carbon footprint
- External sales
- Incorporation of renewables

## Excess Renewables and Nuclear Subsidy

- Net metering and feed in tariffs
  - Cancelled wherever successful
  - The “duck curve” in California
  - Grid acts as a battery – no time value
- RECs and ZECs
  - HB 11 in PA
  - Pushback from FERC
  - PJM capacity market

## The Grid of the Future

- A self-healing grid in emergencies
  - The grid can separate into self-supporting microgrid islands
  - Each island is its own semiautonomous control area
  - Each supplied by Distributed Energy Resources (DER)
  - The islands can support one another (DERMS)
- Microgrids provide grid support services when not in emergency mode
- DER are mostly clean energy resources
- The grid operators conduct the concert

## Questions?

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"The economy is a subset of the ecology."