Power2Peer

Blockchain Innovation for Energy Independence

White Paper

www.Power2Peer.com

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Executive Summary

Over the last five years, there have been major changes in energy. Superstorms have caused power outages that last for days. The proliferation of distributed generation has increased as renewables have become more affordable. Taken together with centralized generation, there is plenty of electric supply. Renewable resources are significantly underutilized. In periods of peak demand, power needs are met with carbon-producing centralized generation and oversized substations. Consumers are left with few choices and little control over their energy.

Energy independence comes to the community with Power2Peer's adaptive solar microgrid system with blockchain-enabled peer-to-peer power trading.

Power2Peer: Bringing local resilience to the grid.

At the same time, the rise of the "sharing economy" has ignited interest in the idea of "energy sharing," where friends, family, and neighbors can provide energy to each other. Using new technologies like blockchain, innovators are creating opportunities for consumers to take control. This is the market where Power2Peer plans to make a significant contribution.

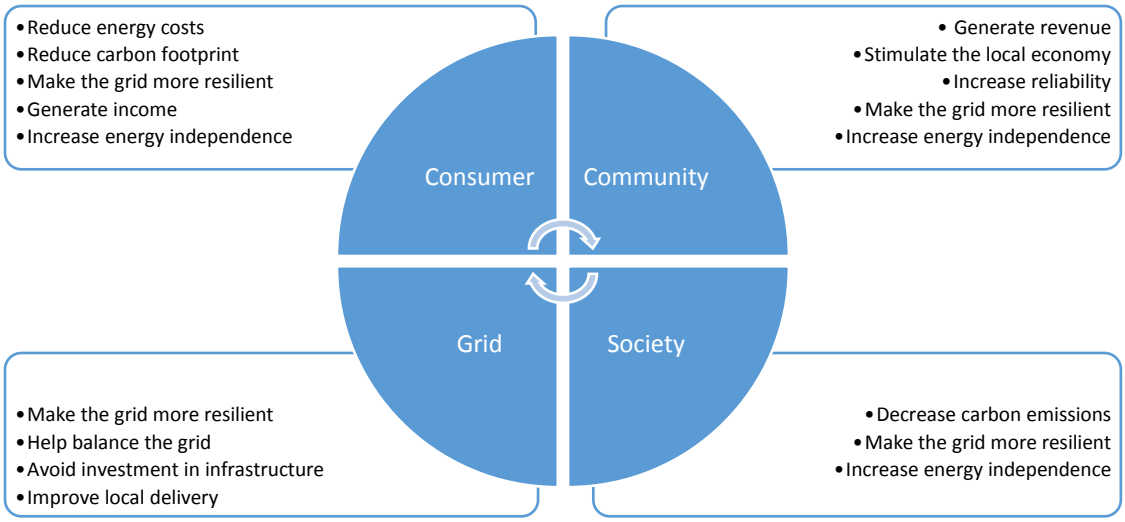
Power2Peer's Offer

Power2Peer's goal is to provide an alternative to the main electrical supply grid by enabling localized microgrids, powered by solar panels and supported with energy storage. No longer will people be completely dependent on a centralized grid operated by large corporations.

A blockchain is a shared, encrypted "distributed ledger" that is maintained by a network of computers with no central authority. The platform is transparent, immutable, traceable and secure.

By opting into Power2Peer's program – the *adaptive solar microgrid system with blockchain-enabled peer-to-peer trading* – people will be able to trade energy in local markets and get electricity through a network of microgrids. Power will be available when needed, even when the utility grid goes down. With solar power, people will contribute to a cleaner environment, minimizing their carbon footprint. Locally produced solar power has a low marginal cost – the sun is free – so consumers will pay less than they would for grid power. By adding storage, solar energy will not be wasted. The benefits to consumers, community, grid and society are numerous (see Figure 1):

Figure 1: The Benefits of Power2Peer, Source: Power2Peer, 2018



The Technology

Power2Peer uses a blockchain framework, with solar panels providing power data using micro-inverters and smart battery inverters as IoT sensors. Power generation data is sent to a cloud-based analytics engine. The analytics engine feeds into a software-defined adaptive controller connected to solar microgrids and storage. Based on information from the engine, the adaptive controller optimizes resilient power flow and enables peer-to-peer energy trading.

The Power2Peer Difference - Bringing Communities Together through the Latest and Greatest Technologies

- **Connecting Communities**: A physical network of microgrids and energy trading market energizes and connects communities with a shared purpose –> making better use of local resources.
- **Advanced Technology:** A unique combination of a fit-for-purpose adaptive controller, smart inverters, cloud and analytics paired with blockchain -> enabling trading and fail-safe operations.
- **Scalable Architecture**: Enabled from the beginning for Big Data and analytics, an architecture of the ASM –> "future-proofing" the platform.
- **Photonic Solar Conversion (PSC)**: Photonic solar conversion panels that generate 20+% more power from the garden variety panels -> reducing the cost of energy.

The Sustainable Business Model

Power2Peer expects revenues from blockchain fees, solar power sales and connecting microgrids. Near-term objectives are to connect multiple microgrids in several cities. Our financial estimations show that the business will be cash positive and generate up to 48% net profit at the end of the life cycle of the system. With more cities coming on board, significant revenue will be generated to create more microgrids across the United States.

For high efficiency solar microgrids using PSC, deployed in 28 cities initially, with each city generating 1 MW of electricity, there is an estimated payback period of 9 years and a cumulative profit of $76 million over five years. The long-term vision is to scale to support thousands of

distributed microgrids, including those not owned or operated by Power2Peer. More importantly, Power2Peer will deliver a cleaner, more efficient, and more resilient grid.