



LO3 ENERGY

Distributed grid solutions that bring
people, technology and energy together

CONFIDENTIAL DO NOT DISTRIBUTE



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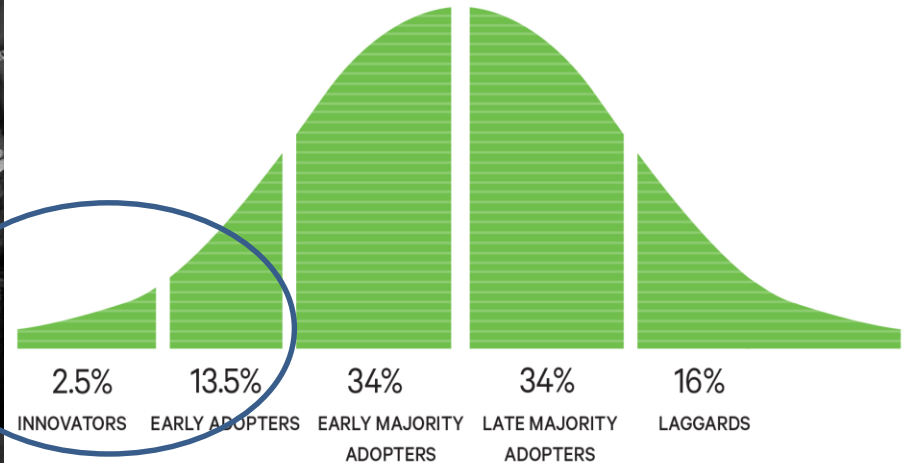
LO3 Energy Background

Utility Scale Programs

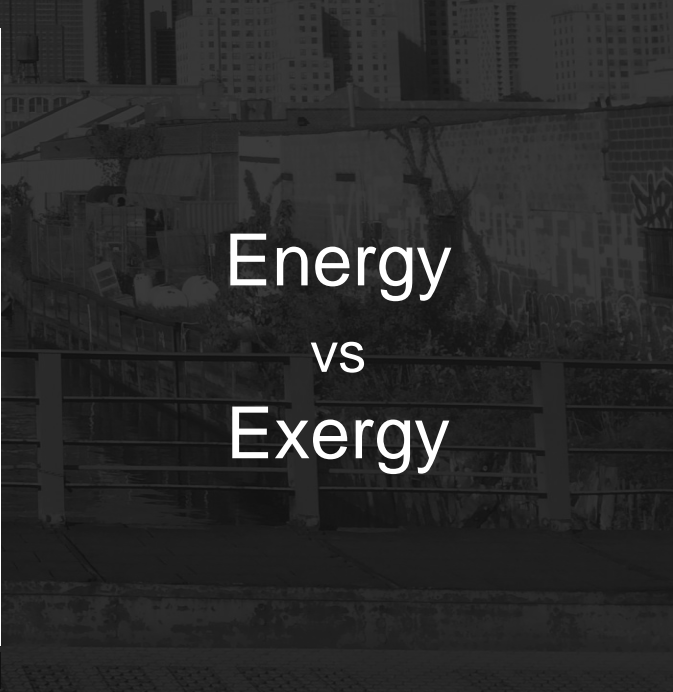
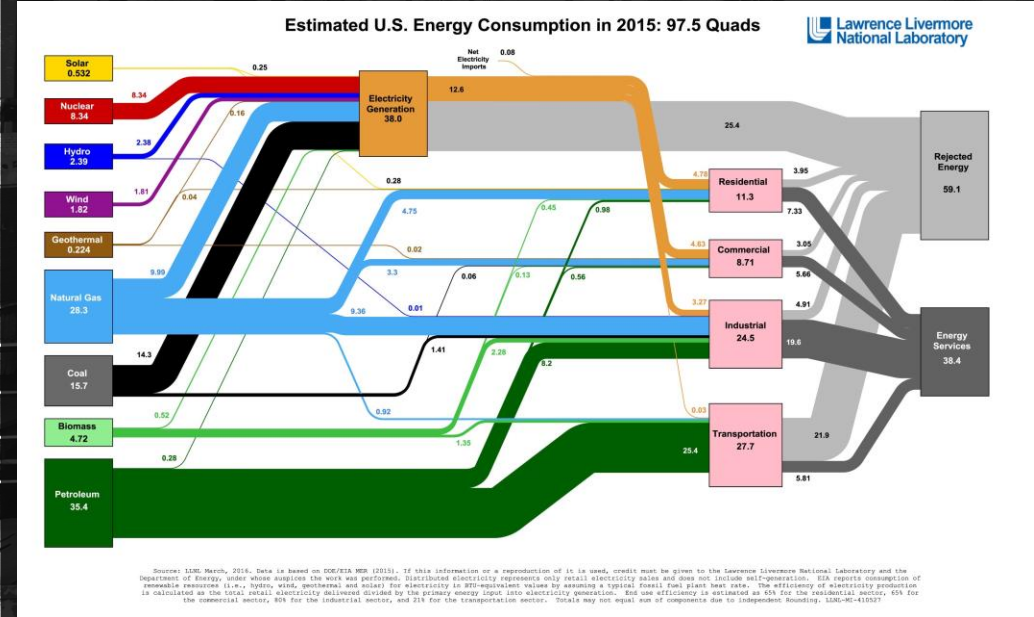
- Applying tested models for emerging tech adoption and market transformation
- Company background:
 - Energy Program Design
 - Community Engagement
 - Codes and Standards
 - REC Markets
 - Blockchain
 - Advanced Meters
 - System Architecture
 - Computation

Technology Adoption Curve

EVERETT ROGERS - DIFFUSION OF INNOVATIONS 1962

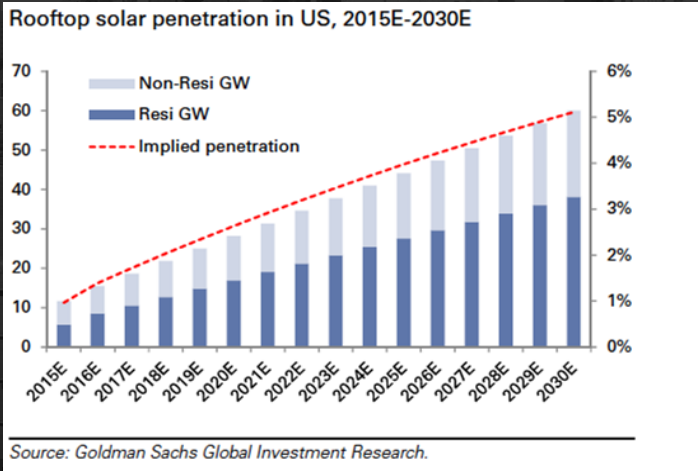
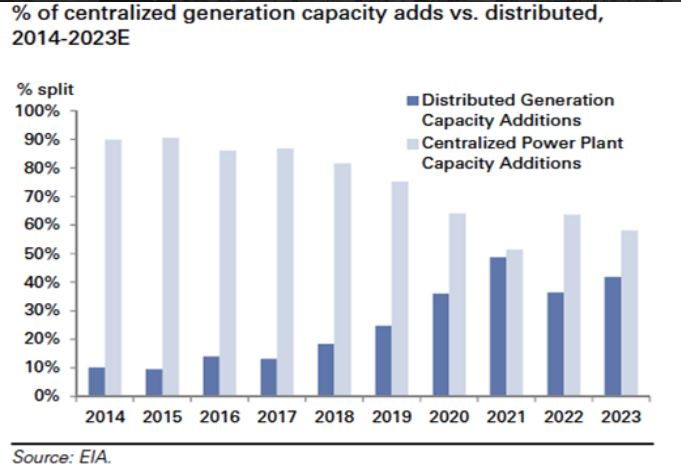


Current Energy Resources – Inefficient and Centralized



Energy vs Exergy

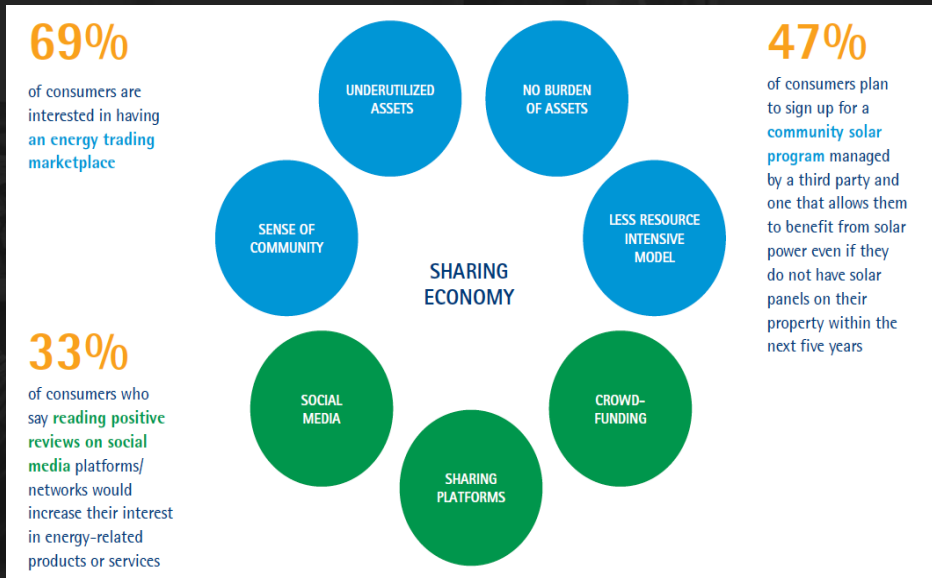
New Energy Resources - Renewable and Distributed



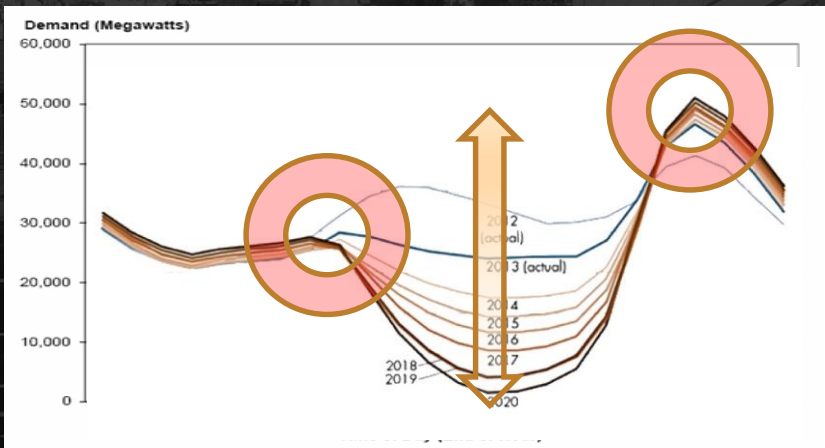
Source: EIA, Nov 2016

More than half of the estimated additional solar generation will be distributed, not utility scale

Consumers Demand New Choice and Services



Historic Load Profiles (CA 1999 - 2020)



Source: Lawrence Berkeley National Laboratory

Utility Grid Faces Structural Issues

- Grid unidirectional and brittle - future calls for fast-acting, resilient, adaptive platform
- Current utility business models do not encourage Distributed Energy Resources
- Regulatory barriers limit consumer participation in energy
- Major market changes underway, unprecedented shifts by utilities and market actors
- “Prosumer” movement creating pressure on existing business models
- Broad, coordinated control of small scale DERs is uneconomic

The Future of the Grid

- Significant market and grid architecture changes ramp exponentially in 3 – 5 years
- DERs, transportation of energy self-organize on economic efficiencies
- Market participants rewarded for maximizing grid efficiency, energy production, storage etc.
- Utility/TSO/DSO returns for increasing efficiency, resiliency or adaptive nature of the grid
- Power markets and utilities will adopt new ways of thinking, operating and competing

Smart Grid/Microgrid Pilots Deliver

Guarantee secure and efficient grid operation with high shares of renewables,
Tapping efficiency and flexibility potentials (in terms of markets and grids),
Ensuring efficient and secure cooperation of all players in the smart energy system,
Making more efficient use of the existing grid structure,
Reducing the need for grid expansion at the level of distribution grids.





Community Energy – Sharing Economy

Blockchain-Enabled Energy Platform



Inverter
 Strings
 About Site
 Syncro
 Baldock Rest Area, I5
 Wilsonville, OR 97158
 Rated 1,749 kW / Net
 LOOK UP SMD
 Zone 1
 Amps Map
 Cellar Map
 Performance

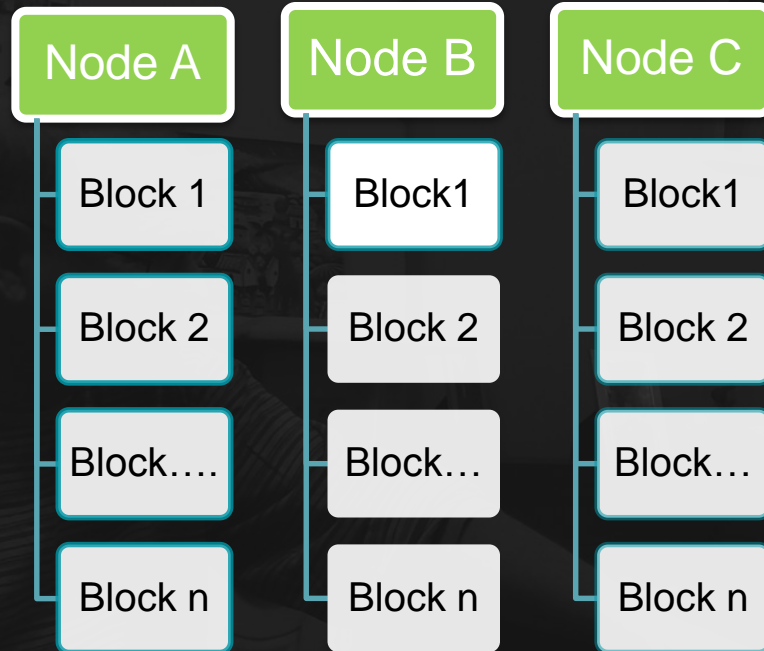
Inverter
 407
 47 % RH
 N 5.2mph
 AMBIENT 60.9°F
 CELL 63.3°F

AMPS MAP
 8.25A - 8.00A
 7.50A - 8.25A
 6.75A - 7.50A
 6.00A - 6.75A
 5.25A - 6.00A
 4.50A - 5.25A
 3.75A - 4.50A
 3.00A - 3.75A
 2.25A - 3.00A
 1.50A - 2.25A
 0.75A - 1.50A
 0.00A - 0.75A
 String Alarm
 If string is 3 or more stand dev away from average in the negative direction

Real Time KW
 Average KW
 Total Average Amps 2.62A
 SMD 83
 SMD 84
 SMD 85
 SMD 86
 SMD 87
 SMD 88
 SMD 89
 SMD 90



Blockchains Enable Transactions



Block Contains:

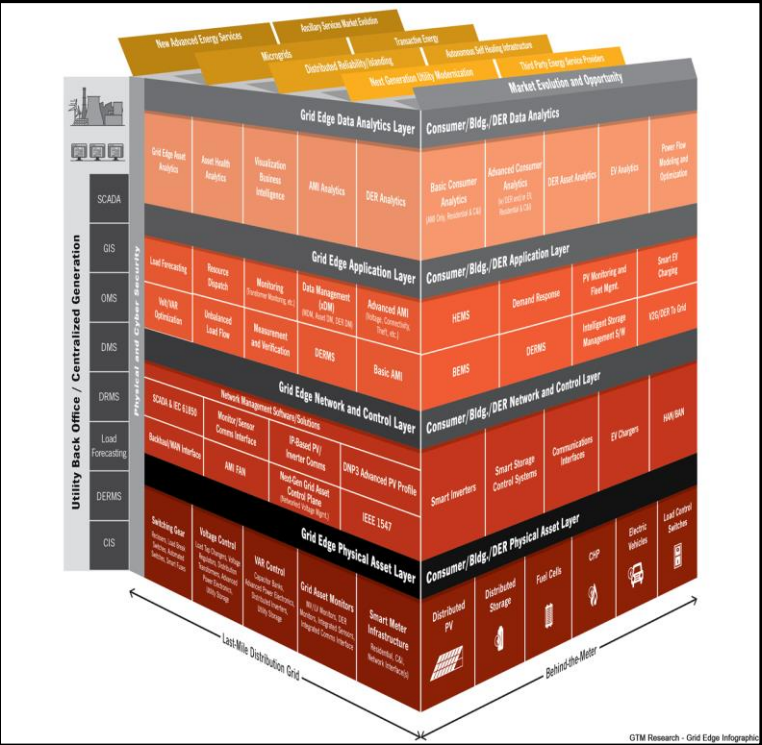
- Time stamp
- Ownership status
- Reference previous block
- List of transactions

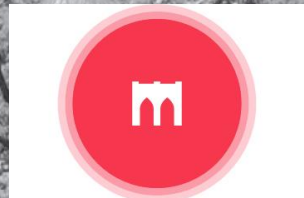
Blockchain Transactions:

- Blockchain platform establishes price
- transparency complies with retail sale regulations
- Auditable / Immutable

Blockchain-based Microgrid Intelligence System

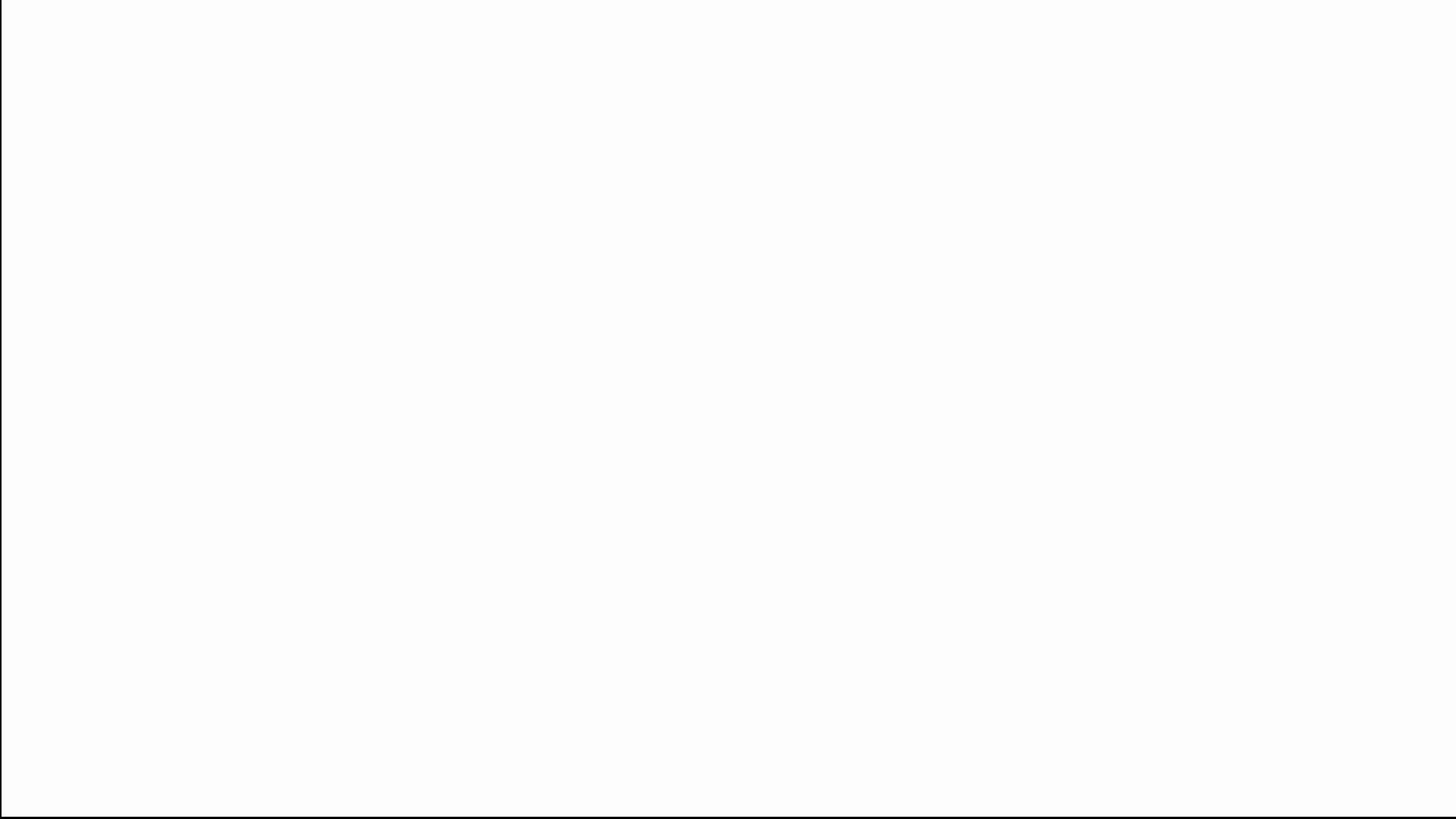
- Transactive, distributed intelligence system to control microgrids
- Based on open-source, cryptographically-secure protocol layer delivering military-grade cybersecurity and real-time data
- Auditable, immutable, secure device control





BROOKLYN
MICROGRID







Tokenization

Tokenization of energy production, storage and consumption creates efficient **local markets**



P2P Markets

Efficient Local Markets attract investment, increase impacts and create **local value** for energy, environment and community



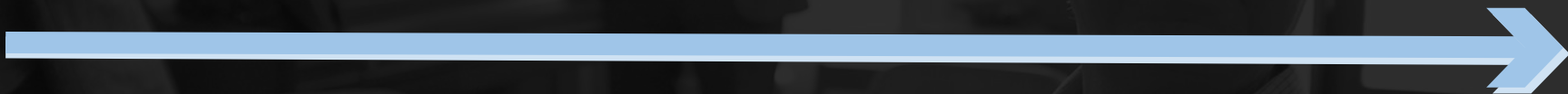
Prosumers

Rise of the **Prosumers** neighbor-to-neighbor, neighbor-to-business community transactions reward **local markets and return community value**



Community Microgrids

Reward efficiency and resiliency allowing participants to optimize **existing energy spend** according to individual **values, priorities and outcomes**



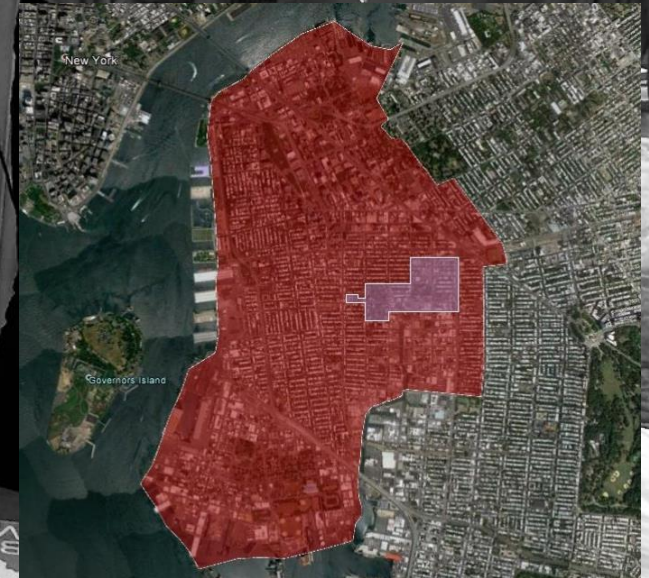




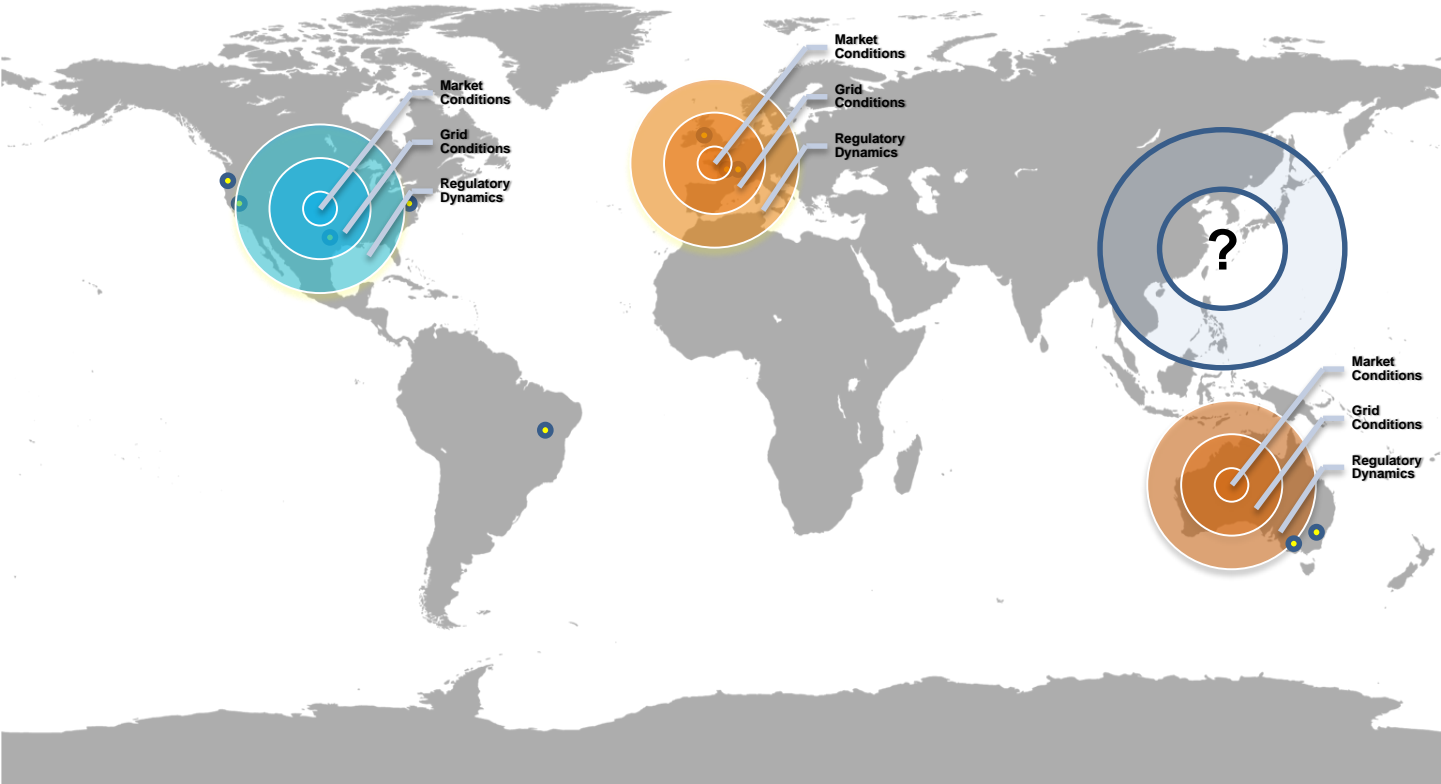
LOB ENERGY

Current Status & Next Steps

- First peer-to-peer energy transactions executed
- Demonstration projects underway
- Testing business models
- Brooklyn Microgrid in development
 - Over 50 sites metered more than 300 participants
- Partners
 - Strategic Partners - Siemens, KIT, AEMO, DB&R



Current Status & Next Steps





New Technology – New
Choices – New Deal

**They are your electrons, right?
Don't forget that.**



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