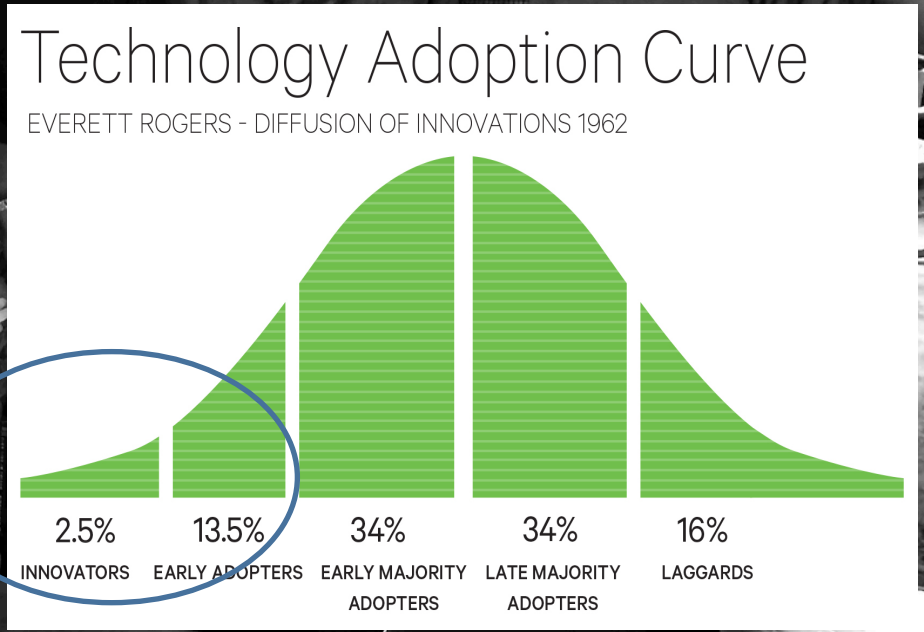
LO3 ENERGY

Distributed grid solutions that bring people, technology and energy together

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



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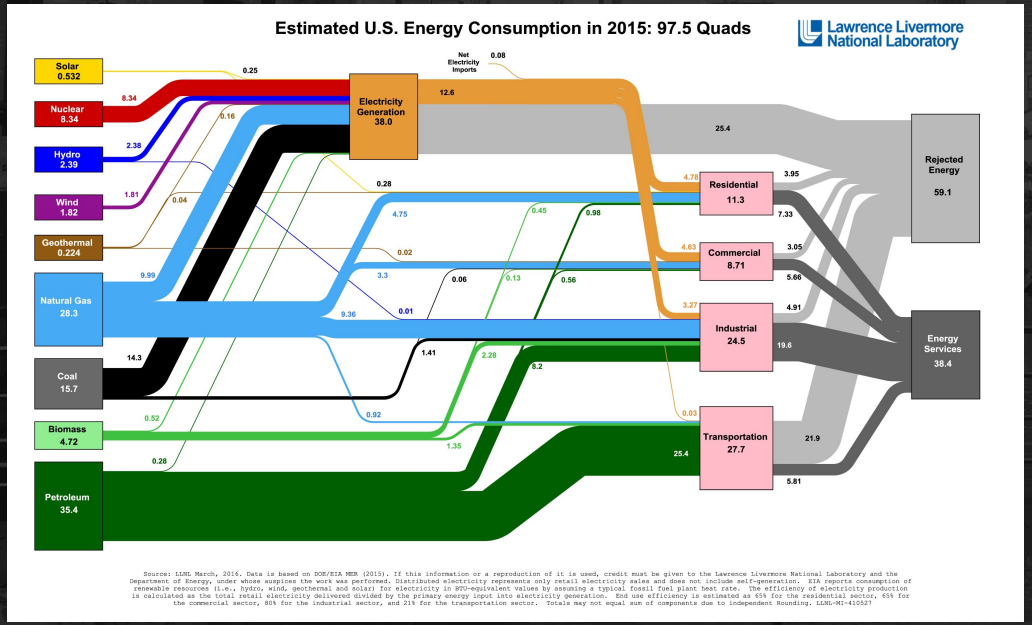
Market Background

Current Energy Resources – Inefficient and Centralized



Source: Lawrence Livermore National Lab

Energy
vs
Exergy

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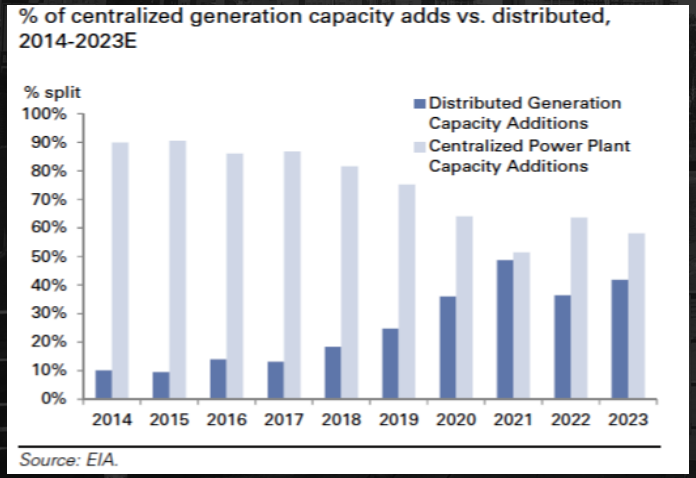
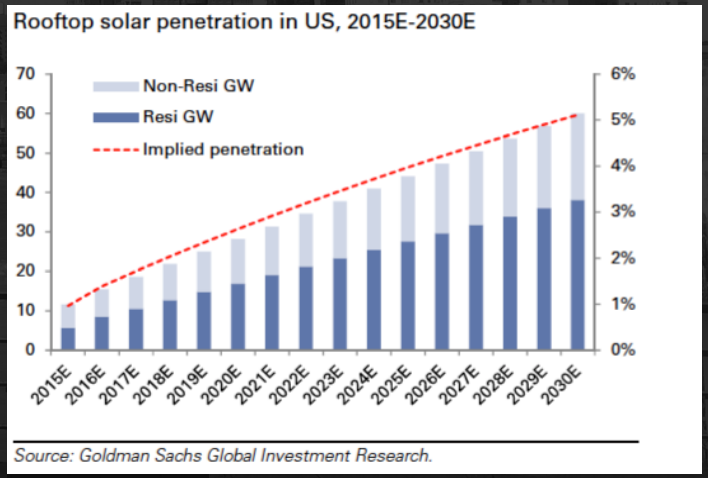
Market Background

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

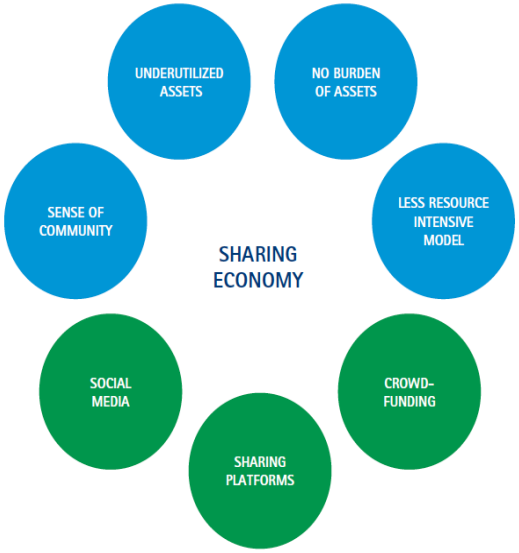
Consumers Demand New Choice and Services

69%

of consumers are interested in having an energy trading marketplace

33%

of consumers who say reading positive reviews on social media platforms/ networks would increase their interest in energy-related products or services



47%

of consumers plan to sign up for a community solar program managed by a third party and one that allows them to benefit from solar power even if they do not have solar panels on their property within the next five years

Source: Accenture's New Energy Consumer research program 2016

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Problem

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

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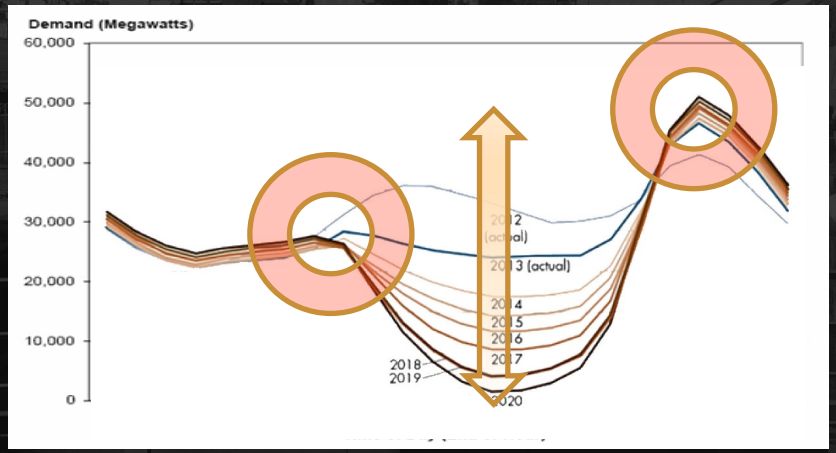
Market Background

Historic Load Profiles (CA 1999 - 2020)



Source: Lawrence Berkeley National Laboratory

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Transactive Energy

The Future of the Grid

- Significant market and grid architecture changes ramp exponentially in 5 – 7 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

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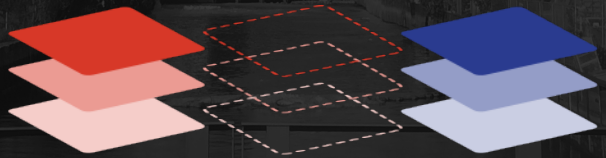

TRANSACTIVEGRID

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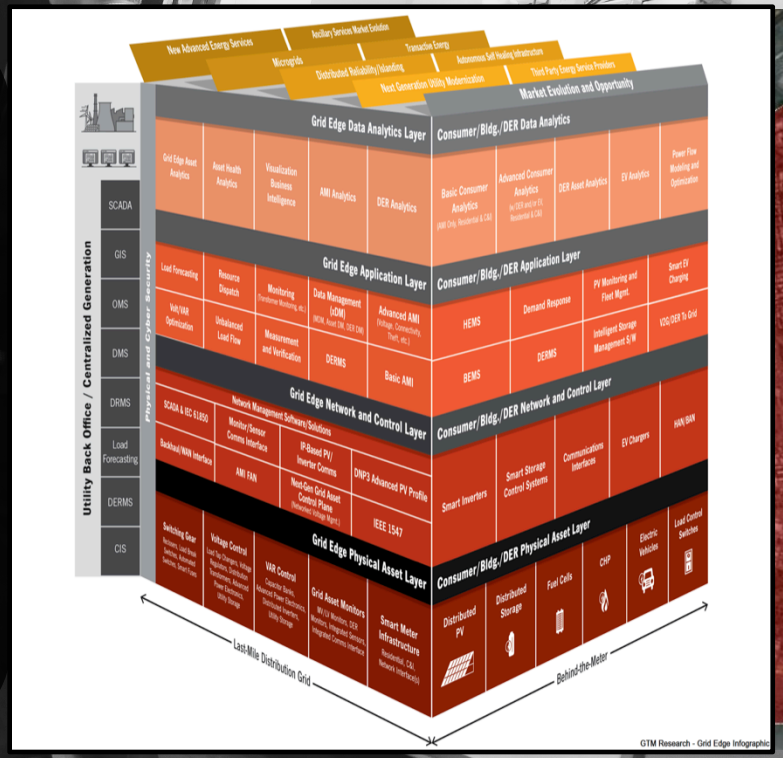
TransActive Grid

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



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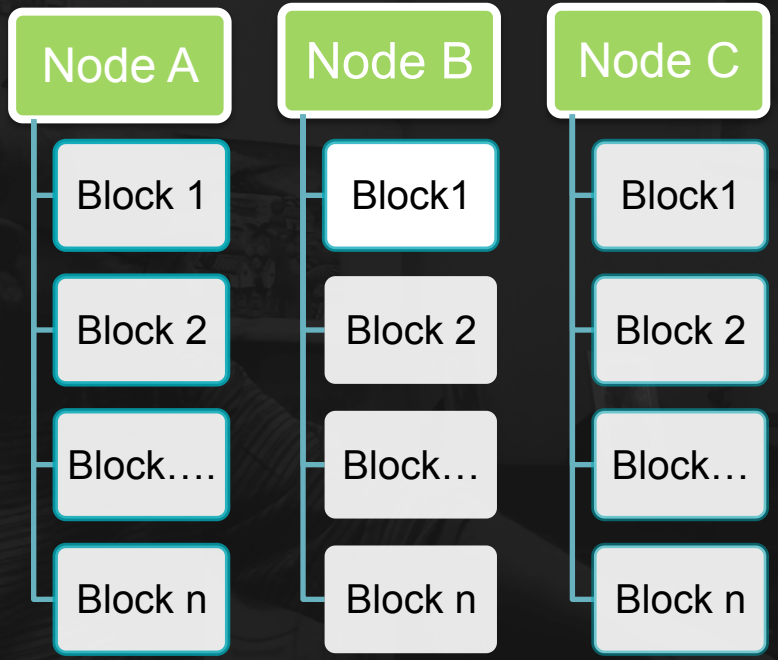
TransActive Grid

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

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Community Energy – Sharing Economy

Blockchain-Enabled Energy Platform


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BROOKLYN
MICROGRID

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Community Energy – Sharing Economy

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**

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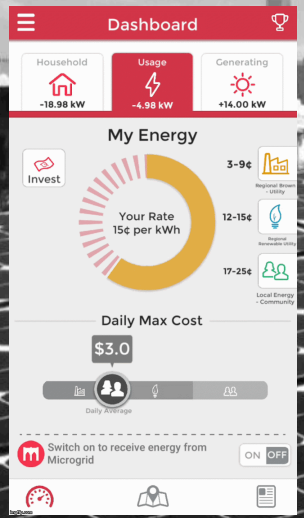
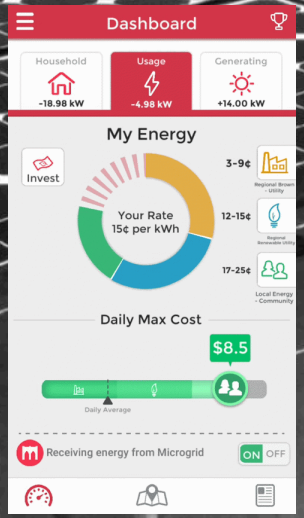
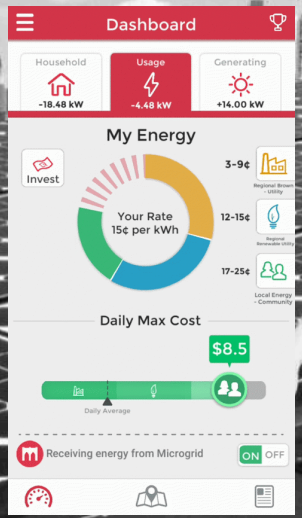
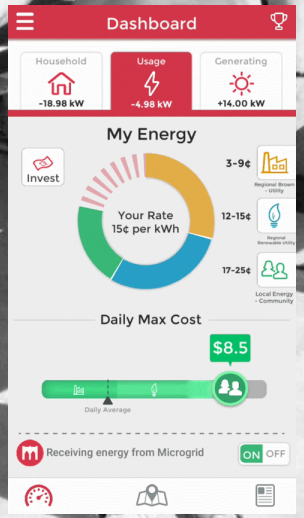
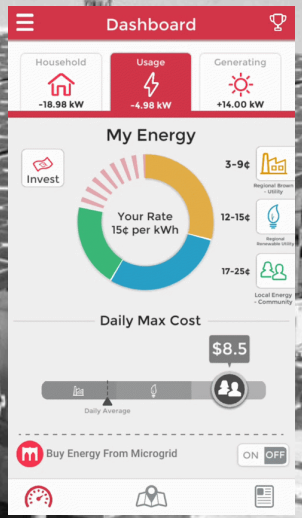
Consumer Choice

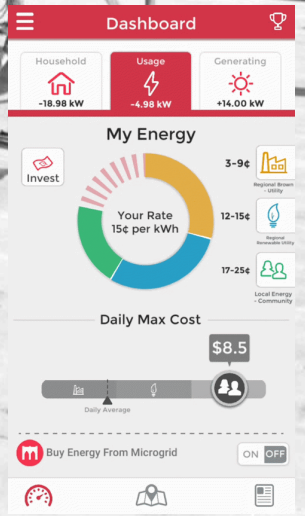












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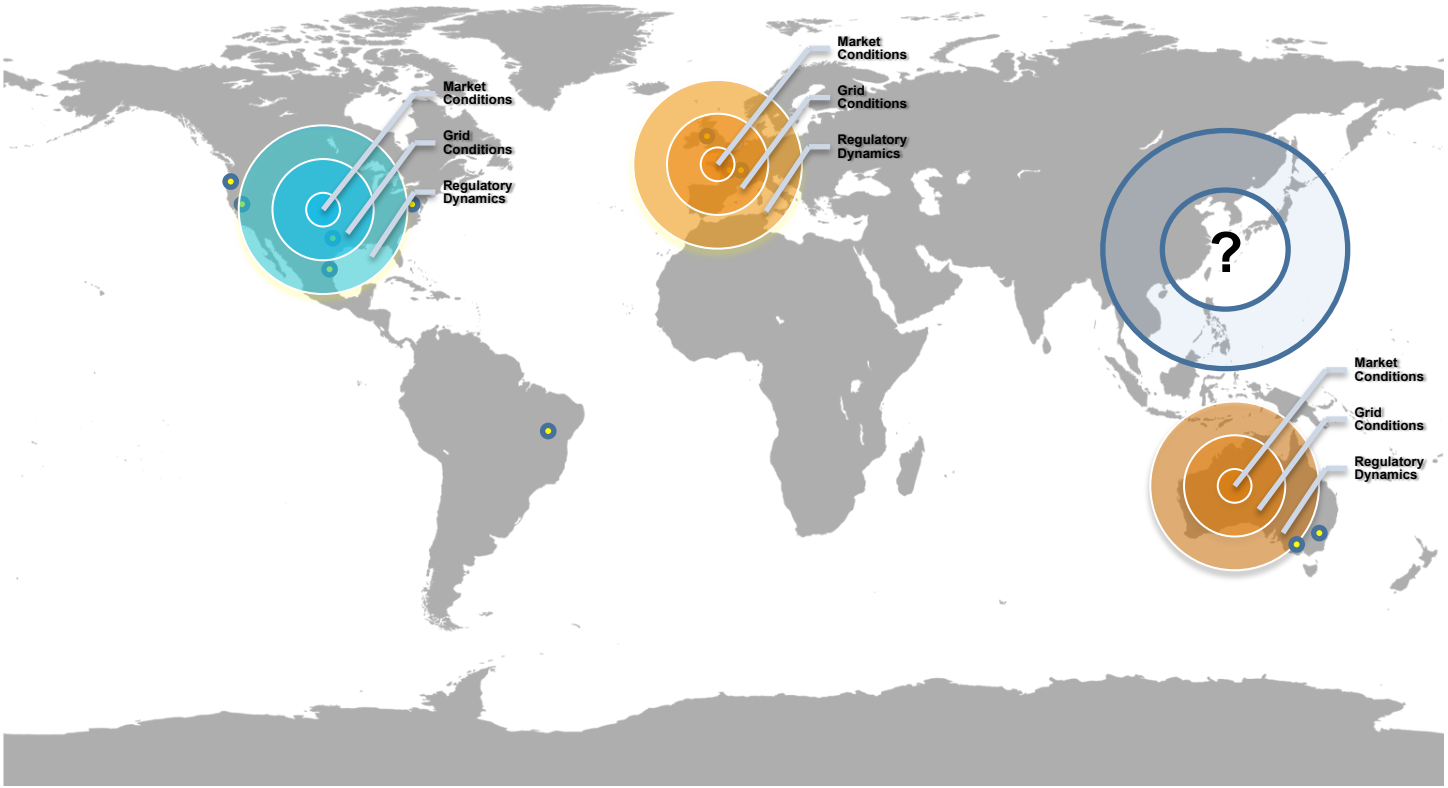
Current Status & Next Steps

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New Technology – New Choices – New Deal
They are your electrons, right?
Don’t forget that.

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