

Creating a Global Ecosystem for Smart Infrastructure



- *based on Open Standards and Open Source*
- *that is Green, Modular & Evolvable*
- *for On and Off Grid Applications*
- *Smart Grid ready*



EXECUTIVE OVERVIEW

The future of infrastructure is just-in time. Just-in-time delivery of structures, ready to support people and business, customizable to the site, long lasting, ready for smart energy and water. Just in time delivery of distributed energy, ready to support structures, the people who live and work in them, and the services they need, and ready for smart grids. Just in time delivery of pure water, ready to support people and agriculture, able to work alongside smart power and smart grids. Just in time delivery of fresh food from local sustainable agriculture, working hand in hand with smart energy and smart water.

Just in time delivery must work with the people already on site. Whether for disaster recovery or urban rejuvenation or a mountain retreat, the people on-site must be able to assemble the systems and get them to work together. Just as no two sites and the people who live there are identical, so no two installations will be identical. Different mixes of structure and energy, of water and agriculture, supporting different aesthetic and cultural expectations, will be assembled on-site by the labor force available.

We are assembling an ecosystem of systems and companies, together creating smart infrastructure. Smart Infrastructure is able to interact with smart grids and smart water using open internationally recognized standards. Smart infrastructure is modular, easy to assemble on-site with semi-skilled labor.

Our components include:

- **PanLbilt** Quick-assembly of Residential and Commercial structures from patented factory manufactured steel and concrete foam panels supporting custom floor plans, rated to withstand Richter 9 earthquakes, 140 MPH winds, energy efficiency to Net Zero levels, easy to stage for rapid deployment.
- **Modular Solar PV** for installation on and around the structures, ready to support transactive energy for power sharing across neighborhood or district.
- **Atmospheric Water Generating (AWG)** patented systems either portable or stationary limited only by the power available and whose product quality exceeds all international standards for drinking water.
- **Smart agriculture** employing patented hydroponic methodology that can be integrated with both the smart power and smart water systems in either wide area or land conserving configurations.

Field integration of the systems with semi-skilled labor is possible because of careful physical engineering, and because the systems negotiate balance among themselves using open source standards-based transactive resource management.

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BACKGROUND

Transactive energy systems are being developed at every level of the US power grid, bulk power market, distribution management, campus or neighborhood microgrid, and in-building microgrid. Transactive energy adapts as new systems and new technologies are introduced into a microgrid. Easy adaptation supports installation and modification of systems by local labor.

Some of its most interesting applications of transactive energy are in the off-grid or islanded environment. Islanded environments are typified by scarce and perhaps intermittent power supplies. The operation of individual systems in an islanded environment have proportionally large effects on the local power supply. Transactive energy dynamically balances supply and demand.

Transactive energy is one type of transactive resource market. Transactive resource markets allow integration of disparate systems without low-level process integration. New systems and new technologies can simply be introduced to and integrated with a transactive resource market. Transactive resource markets work whenever the value of a commodity is determined by the precise time and location that it is exchanged. Transactive water management names a transactive resource market in water.



CAD based production allows us to provide buildings tailored appropriate to local motifs and construction codes.