

Volttron Foundation

Creating a Vibrant Open Source Ecosystem



U.S. DEPARTMENT OF
ENERGY

Energy Efficiency &
Renewable Energy

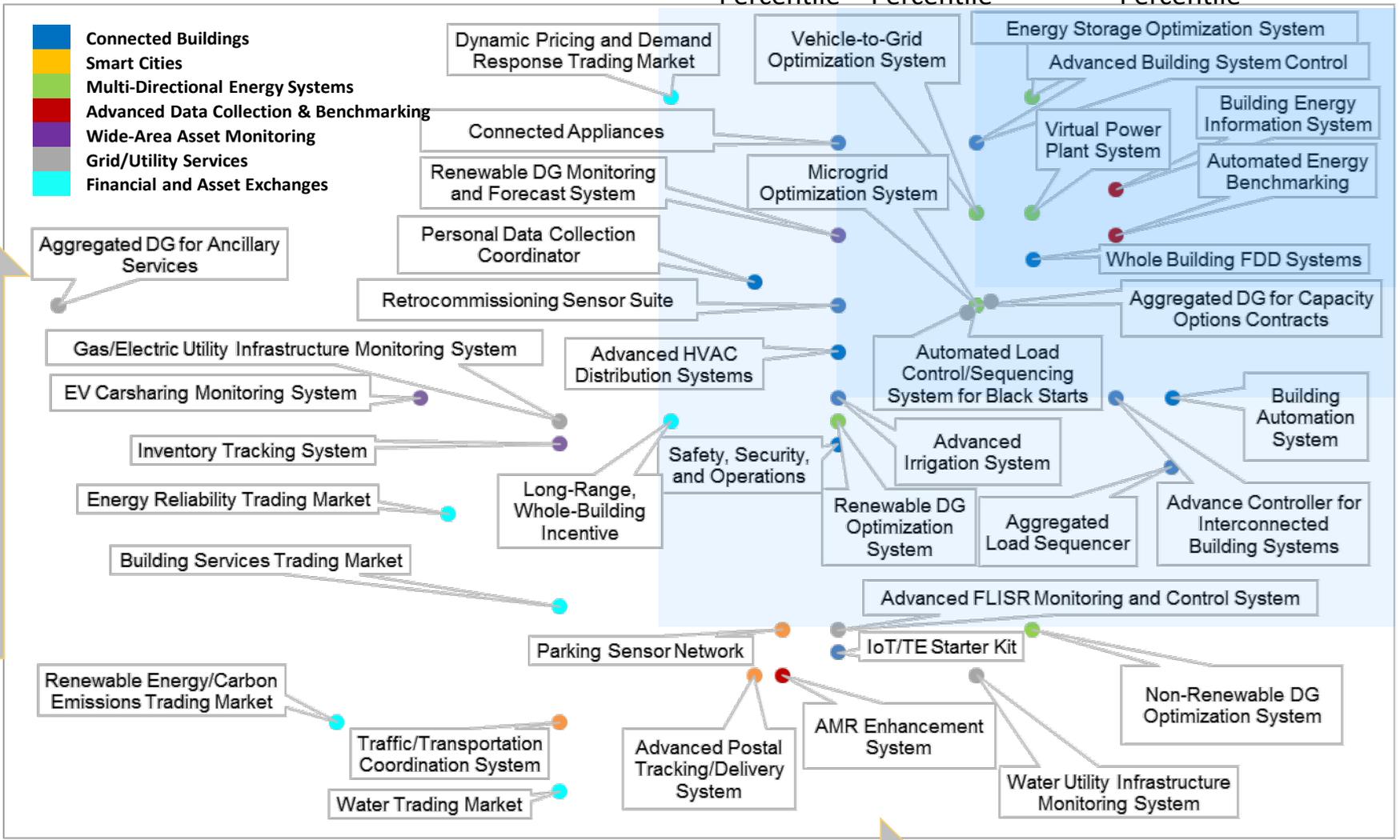
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Overall scores, segmented by percentile

25th Percentile 50th Percentile 75th Percentile

- Connected Buildings
- Smart Cities
- Multi-Directional Energy Systems
- Advanced Data Collection & Benchmarking
- Wide-Area Asset Monitoring
- Grid/Utility Services
- Financial and Asset Exchanges

Market Attractiveness Score



Technology Attractiveness Score

Interviewees believe DOE and PNNL should take a lead role in developing Transactive technologies and demonstrating their opportunities to utility, regulatory, and policy stakeholders.

Opportunities for DOE/PNNL Leadership

- » Many believe that a national organization, such as DOE, could create a *branded program or certification* to show that a Transactive product meets certain communication and connectivity criteria.
 - Eventually the market will encourage all actors to participate.
- » Interviewees believe that utilities, regulators, and other policy makers need demonstrations of the value and economics of Transactive capabilities, and this is a good role for DOE and PNNL.
 - These demonstrations could help develop the energy pricing markets necessary for some TNs.
- » In addition, several interviewees identified the need for more utility or regulator participation Volttron and Transactive development by DOE/PNNL .
 - This will help ensure that technologies operate within a utility's regulatory, security, communication, and compensation frameworks.



Our Starting Point: VOLTRON in the BMS

F1080 Assessment
2016-2017

Key Finding: There are dozens of companies investing billions into their own proprietary solutions and platforms.

Partial List

New and Emerging Companies and Standards Bodies



Mainstream Companies Expanding Their BMS, IoT, and MicroGrid Offerings



Our Perspective: The market is highly fragmented and saturated with dozens of competitors who are investing billions in capital. Some are already using and/or are considering VOLTRON.



Our Recommendation

Create or join an open-source foundation to manage VOLTTRON code

What it is

A non-profit, open-source organization that is responsible for managing the VOLTTRON code base and advocating and supporting greater market adoption.

How it Operates

Not-for-profit entity that is funded through financial contributions / membership fees and staffed with business and technical VOLTTRON experts

What it Focuses on

Strengthening and expanding the VOLTTRON code base so that companies can more effectively build commercial products on the platform.

Mission / Value Proposition

Ensuring the sustainment, growth and adoption of VOLTTRON as the platform for market spaces such as transactional energy, industrial IoT and BMS, among other possibilities.

Revenue Model

Membership fees, professional services, training, conferences, technical design, customer support

Transitioning Our **Vibrant** Open Source Volttron Eco-system...

- PNNL developed Volttron Core internally for Future Power Grid Initiative in 2010
 - BTO and PNNL agreement follows to continue with BTO support.
- DOE's committed to Volttron started in 2012 while investing in what you know it as today –
 - core development in foundational code (cybersecurity, messaging, etc.),
 - core development to build applications (cyber secure applications to deliver solutions to owners/operators leveraging building components), &
 - support for users, code, and open source distribution.
- DOE PNNL in discussions on migrating code and ownership to an Open Source Foundation.
 - DOE would continue to invest at PNNL/ORNL/Labs in core areas and contribute that code.
 - DOE would fund the initial care and feeding at the Open Source Foundation.
- **DOE-PNNL will be communicating that direction in Summer 2017.**

Maintaining and Supporting the Eco-system...

- We continue to need help...
 - Users to develop applications that become solutions,
 - Businesses – what can we do to help build and support small businesses, new, or existing businesses,
 - Your success = Our success = Volttron's success
 - ~~“Steal our available research”~~ → Actually, we will give it to you
 - Contributions in code and as members commits,
 - Contributions as members for direction, and
 - Support for students, academics to increase complex control sciences.

Thank you.

- Joseph Hagerman, Joseph.Hagerman@ee.doe.gov