e- Lab Summit

meeting recap

e- Lab® Electricity Innovation Lab AN INITIATIVE OF ROCKY MOUNTAIN INSTITUTE

thank you!

Thank you for being a part of e-Lab Summit 2017! Without your participation and perspectives, the collective work advanced at Summit would not have been possible. As you return to your work, we hope that the insights and connections that you made in New Mexico support you in meaningful and actionable ways. We wish you luck in all of your endeavors, and hope to see you at a future e-Lab event!

The e-Lab team

ground rules

you can say **who was there**
and **what was said**
but **not who said what***

Please remember these rules as you share the outputs of your work at Summit, including the contents of this document.

**without their permission*

follow-up

Offers of support from the e-Lab team

Don't hesitate to contact us with follow-up questions, comments, or requests related to e-Lab. For instance, we're happy to:

- make introductions to other Summit participants, e-Lab network members, or RMI staff
- share information on the collaboration frameworks we use (e.g., types of complexity, 4 ways of talking and listening)
- work with you to refine the Summit for 2018
- send copies of RMI reports or other analyses, briefs, etc.
- explore ways for you or your organization to get more involved with e-Lab, including as a full member

Please contact Mark Silberg (msilberg@rmi.org) with any follow-ups.

e-Lab Accelerator

What is e-Lab Accelerator?

e-Lab Accelerator is an invitation-only, four-day working meeting to accelerate high-impact and innovative projects at the electricity system's distribution edge.

Why attend e-Lab Accelerator?

We'll help you unlock opportunities to drive projects forward more effectively, and collaboratively. Specifically, Accelerator will give teams:

- **A structured working session** to make progress on their project or initiative
- **A rich learning experience** featuring experts on the latest thinking on new utility business models and distributed resources in the U.S. electricity sector
- **Tools and training** to conceptualize problems in collaborative and innovative ways
- **New alliances** to form a broader support network with other teams working on similar projects
- **A unique environment** conducive to creativity and breakthrough ideas

Is e-Lab Accelerator for you?

Accelerator teams comprise 5–8 people representing multiple project stakeholders. Successful teams bring together the right combination of vision, experience, knowledge, and commitment to a project that can accelerate change in the electricity system. Projects must be actively under development at varying levels of maturity.

May 1-4, 2018

Sundance Mountain Resort, Utah

pod topics

Smart Heating Electrification

Infrastructure Planning and New Mobility

Blockchain and Transactive Energy

Rate Design Pathways

Value Stacking for DERs

Distributed Grid Infrastructure

Utility Business Model Pathways

LMI-Focused Utility Business

your pod's recap is in the next section

value stacking for DERs

Pod Session Recap

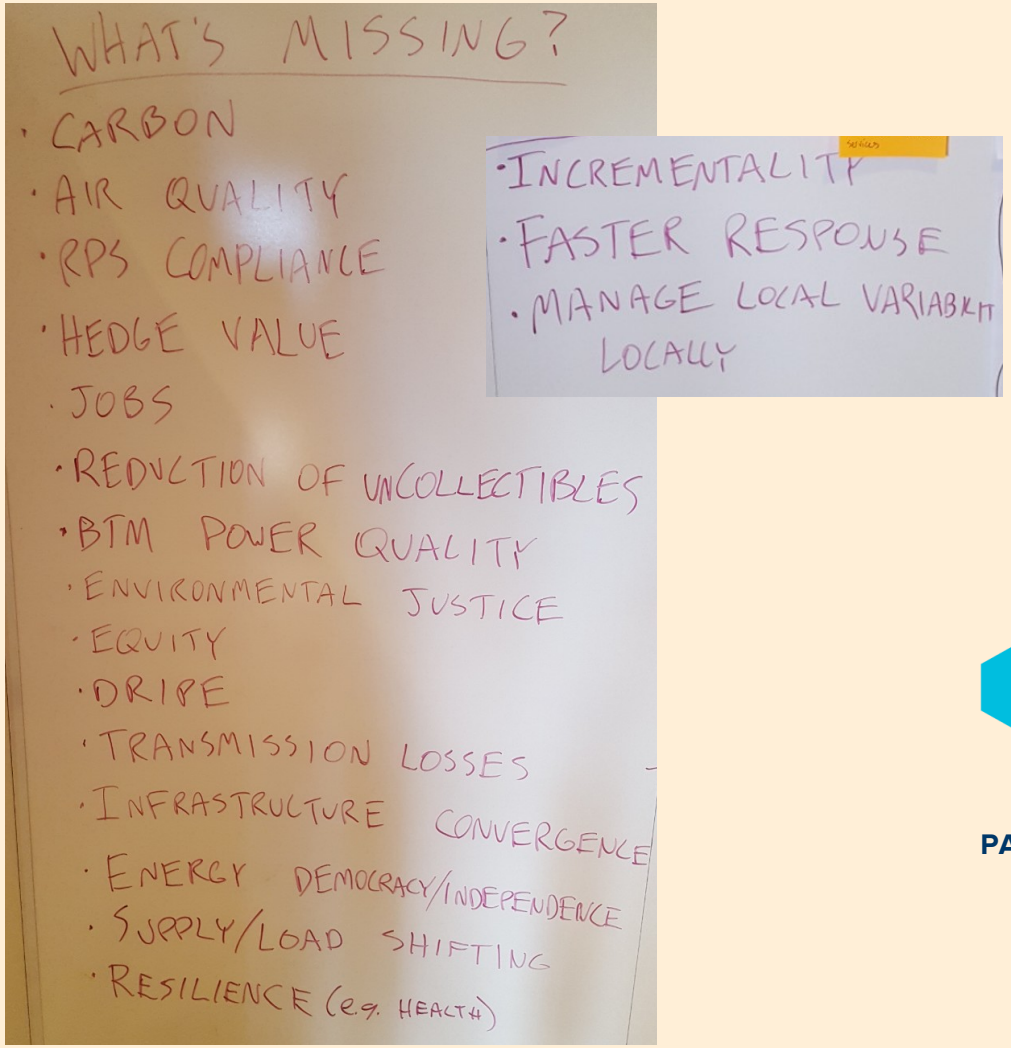
list of values

The discussion of value streams opened with a CPUC/CAISO list of grid services (right). The table is organized by service domain on the left. A DER is eligible to provide services in its own domain, and any domain below it. These are primarily grid services, and don't include a wider range of values.

Service Domain	*Service*
Customer	TOU bill management
	Demand charge management
	Increased PV self-consumption
	Back-up power
Distribution[1]	Distribution capacity/deferral
	Reliability (back-tie) services
	Voltage support
	Resiliency/microgrid/islanding
Transmission	Transmission deferral
	Black start
	Voltage Support
	Inertia
	Primary frequency response
Wholesale Market	Frequency regulation
	Imbalance energy
	Spinning Reserves
	Non-spinning reserves
Resource Adequacy	System RA capacity
	Local RA capacity
	Flexible RA capacity

list of values

To capture the broader range of values that DERs are capable of providing, the group had a brainstorming session to identify what was missing in the CPUC/CAISO framework. Many of these values are difficult to measure, but form a key component of the value proposition for DERs.



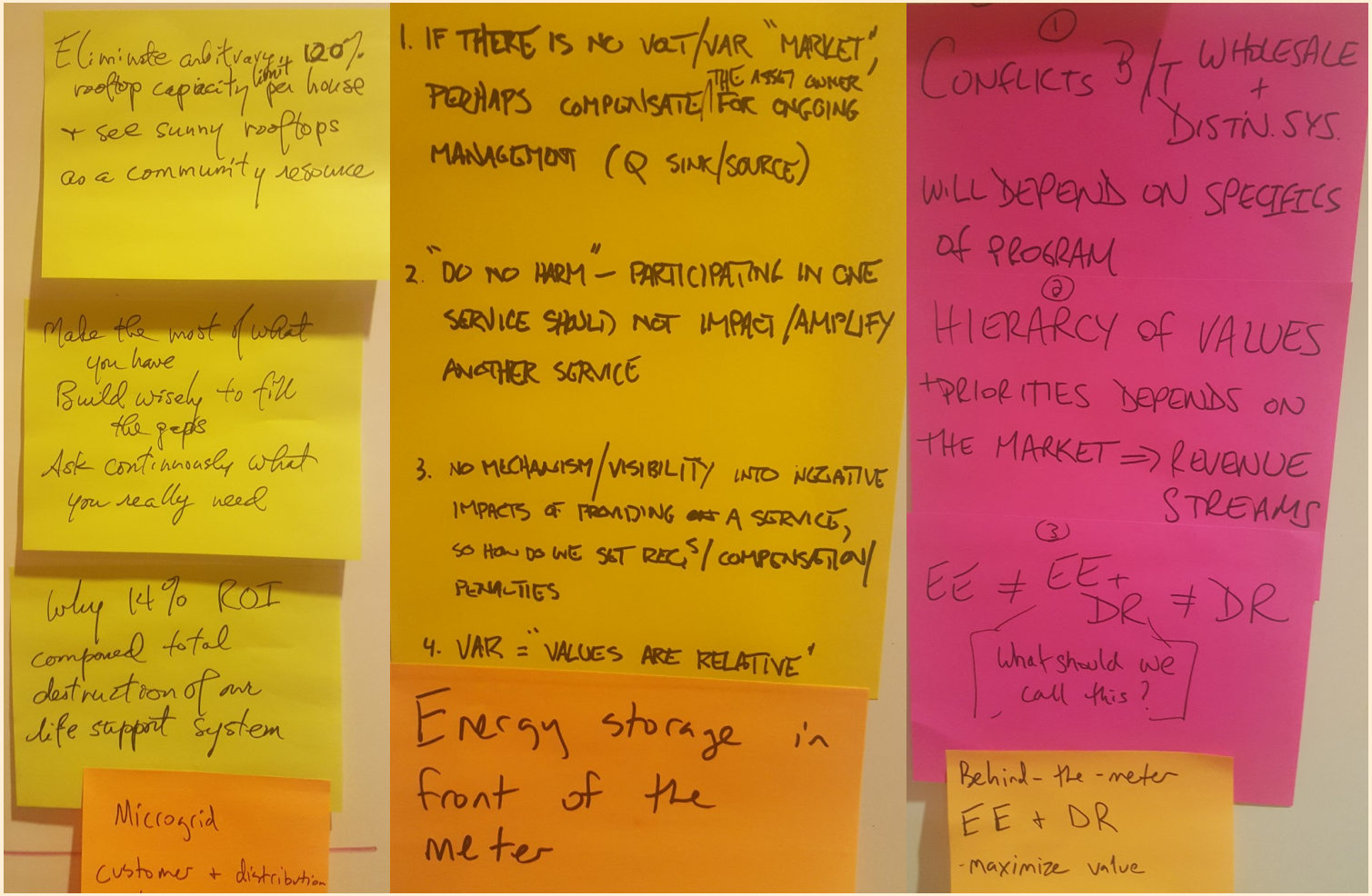
use cases

To ground the discussion with examples, the group brainstormed use cases for DERs. Several people agreed to combine, resulting in the following 7 use cases. The group self-organized to discuss 5 of the 7 cases.

DER	Domain	Values Provided
Microgrid / Aggregation	Customer	Customer & distribution values
Energy storage	Distribution	Distribution & transmission/wholesale values
Energy efficiency & demand response	Customer	Customer, distribution, & societal values
Solar PV & energy storage	Customer	Customer & distribution values
Solar PV	Customer or distribution	Distribution & transmission/wholesale values
Fast responding DER	Customer	Customer, distribution, & transmission/ wholesale values
QF Biogas Plant	Distribution	Distribution, transmission/wholesale, air quality, waste resources

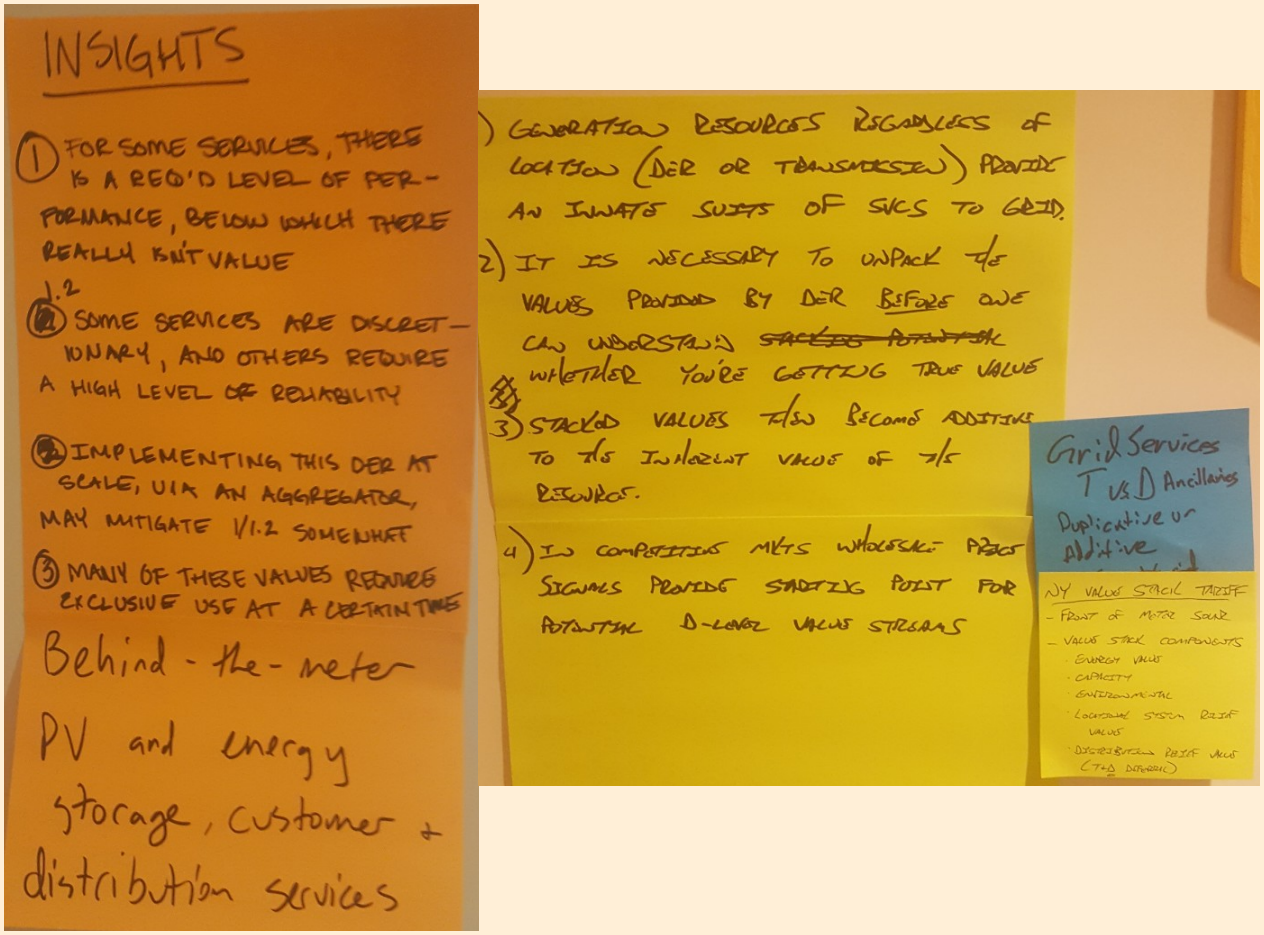
use case insights

The following insights were the result of our discussion on Day 2 (page 1/2):



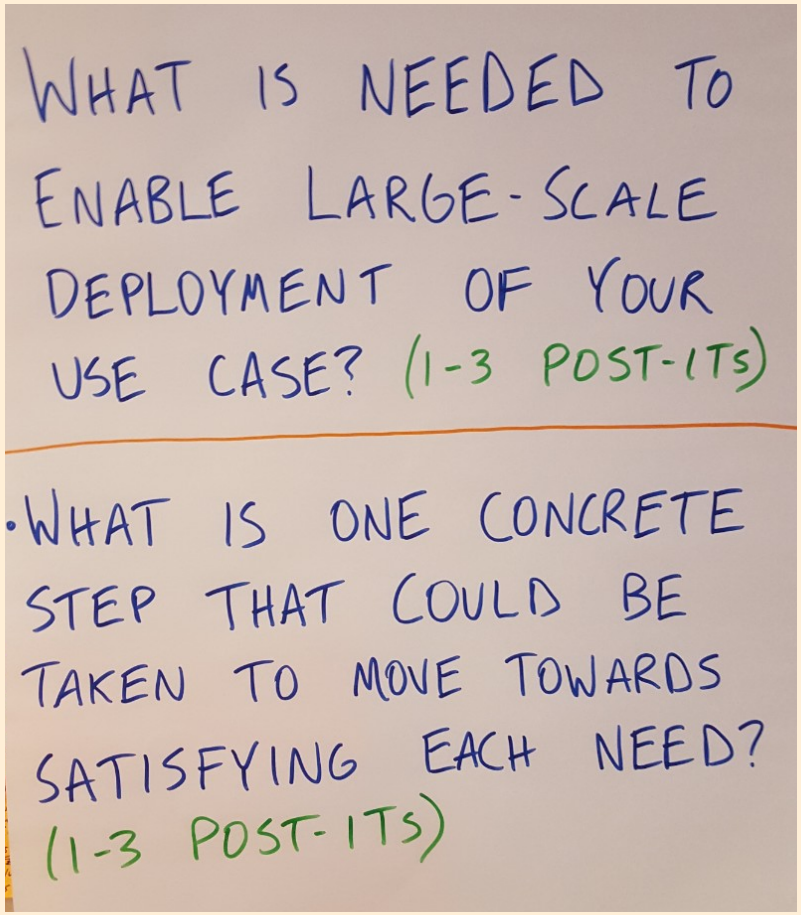
use case insights

The following insights were the result of our discussion on Day 2 (page 2/2):



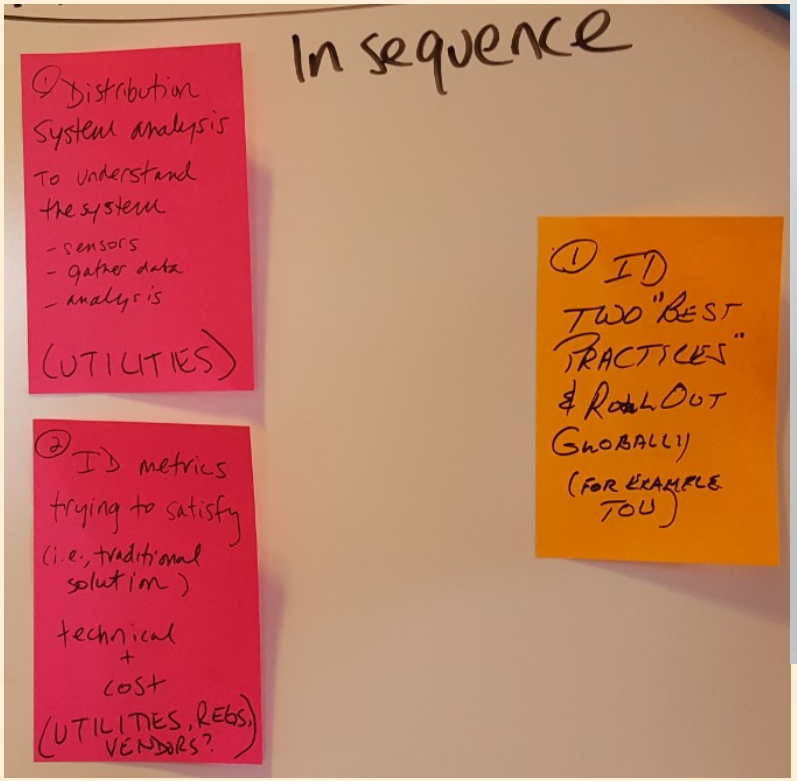
needs & next steps

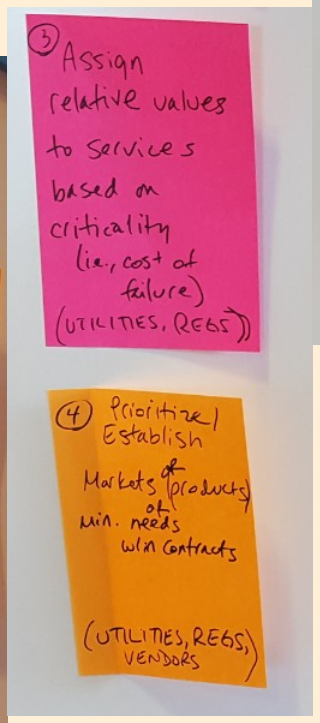
On Day 3, the use case discussion groups transitioned towards identifying needs, and the actions that could be taken to address those needs.

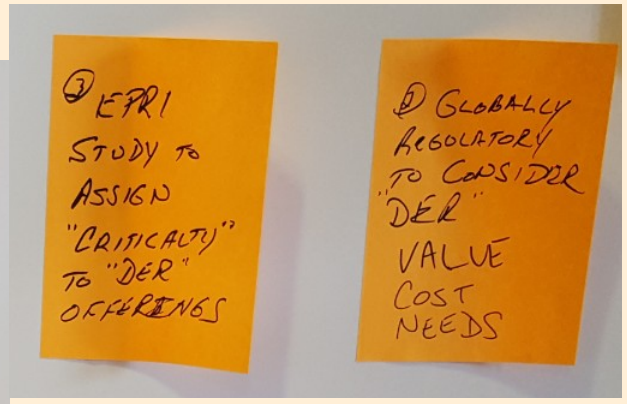


needs & next steps

Needed actions



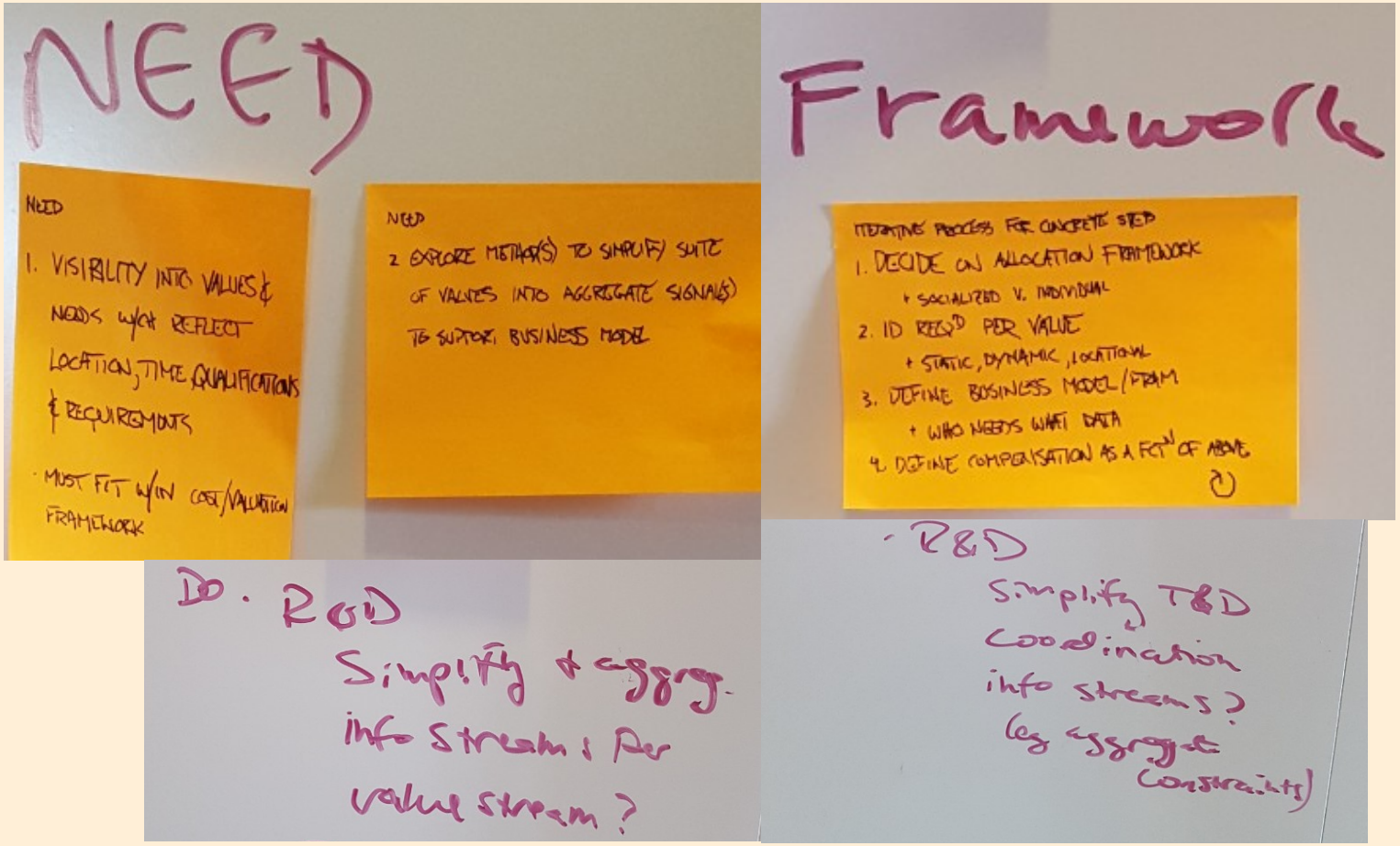




EE and DR Behind-the-Meter Maximizing Total Value

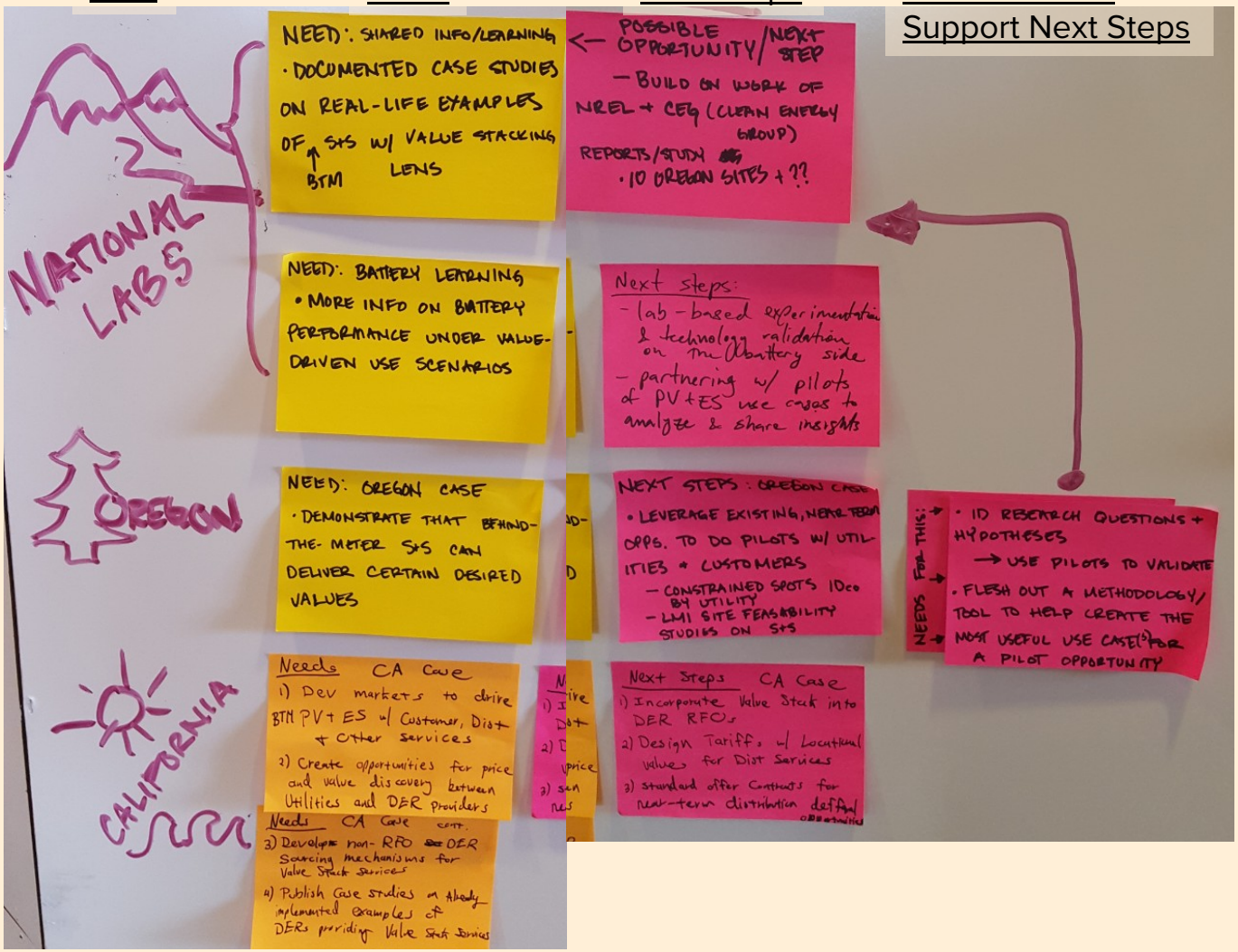
needs & next steps

Storage on Distribution System Providing Distribution & Transmission Services



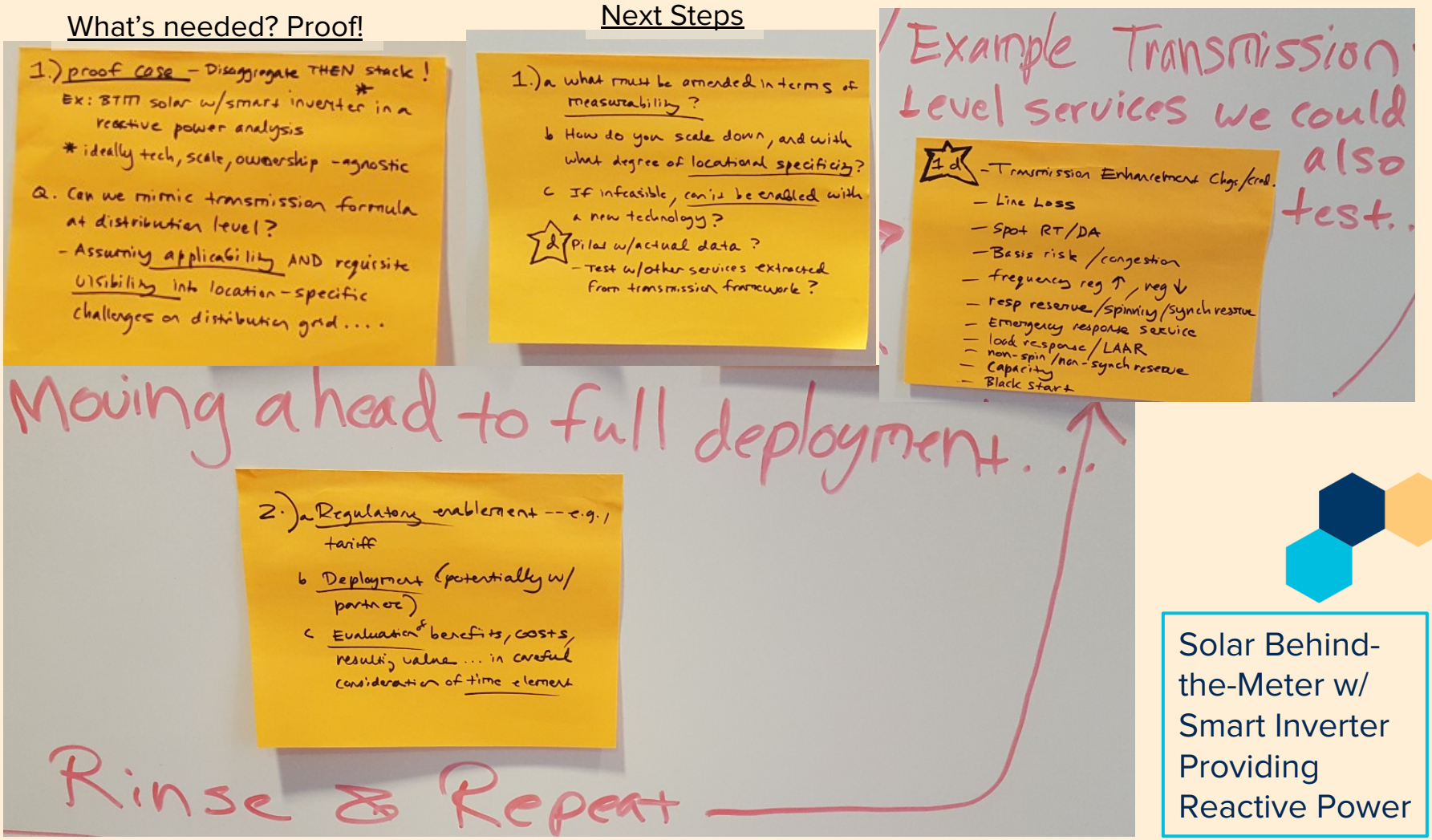
needs & next steps

Who | Need | Next Steps | Addl Needs to Support Next Steps



Solar + Storage Behind-the-Meter Providing Customer & Distribution Value

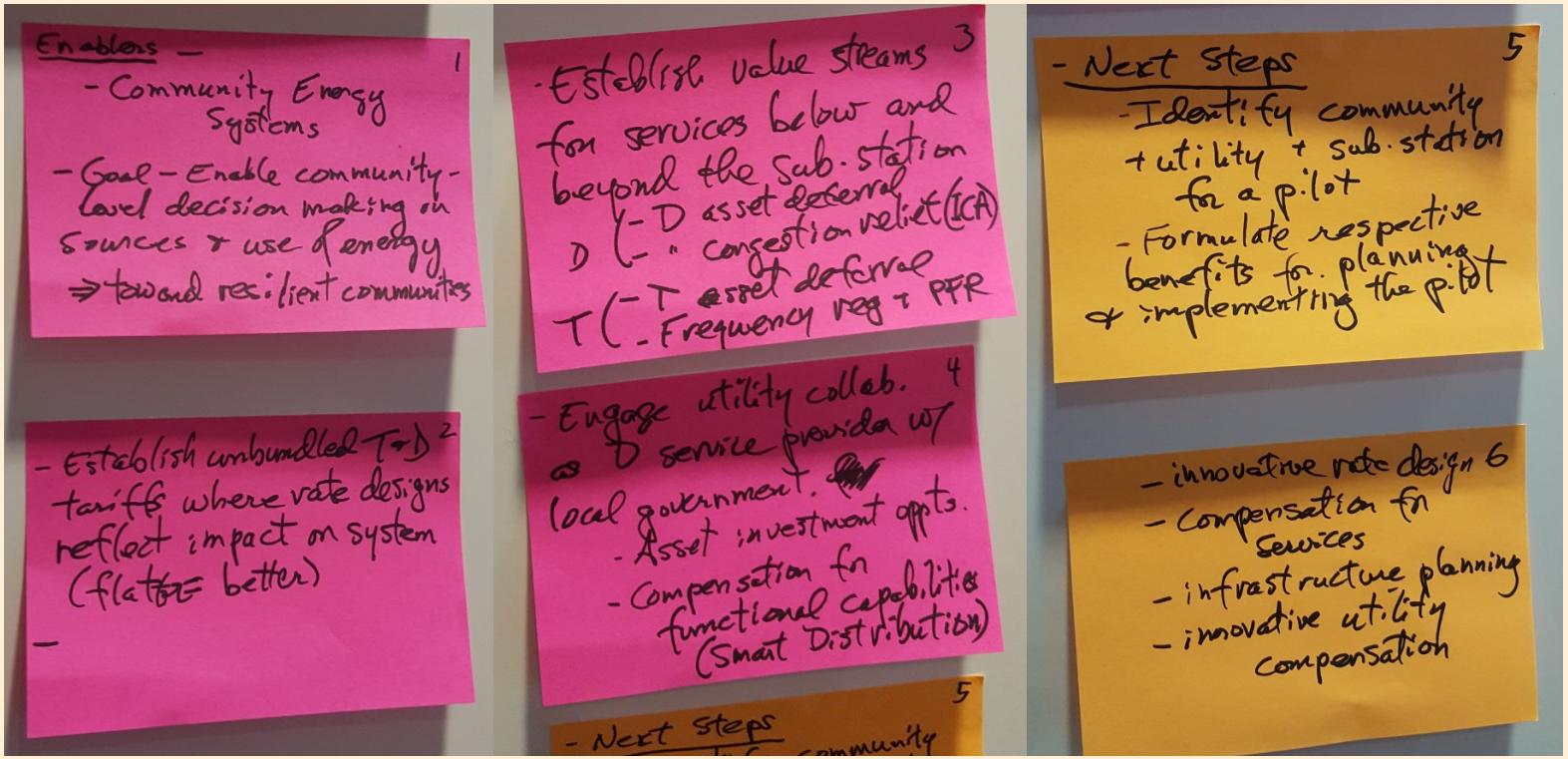
needs & next steps



Solar Behind-the-Meter w/ Smart Inverter Providing Reactive Power

needs & next steps

Aggregation/Microgrid on Distribution System
Providing Distribution & Transmission Services



key themes for enabling value stacking

Defined vs. Undefined	While some value streams are currently well-defined and compensated, many others are yet-to-be compensated or may never be compensated.
Hierarchy of Values	Some values/services are critical to reliable grid operations and will take precedent over others. Compensation structures must account for this.
T&D Coordination	Coordination between transmission and distribution system operators will need to be improved so that services don't conflict, or cause unintended side effects.
Researching Needs & Value Streams	Some research and analysis will need to be done to establish system needs and the relative value that DERs can provide, across the dimensions of time and location.
Testing Use Cases	Values provided by DERs must be validated in real-world applications through demonstration projects. Results should be disseminated as case studies.
Defining Compensation Structures	New compensation structures (e.g., tariffs, market services, etc.) will need to be established for many of the value streams identified.

thank you!

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