

MICROGRID KNOWLEDGE™

2023 CONFERENCE

LIGHTS ON!

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Transactive Energy Tariffs: A new path to market for microgrids



KAY AIKIN,
Co-founder,
Chief Product Officer,
Dynamic Grid

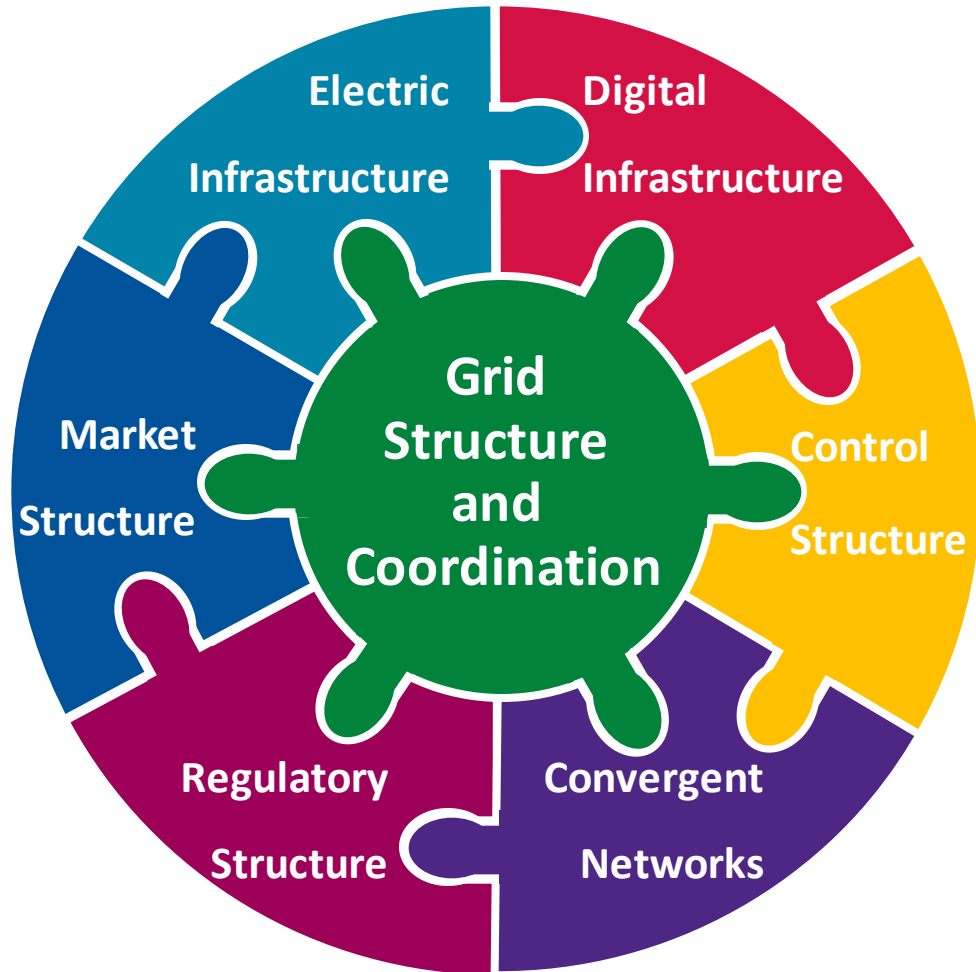
Dynamic Grid provider of advanced DERMS platform and energy storage for utilities, buildings and microgrids

Kay Aikin, Dynamic Grid
**Grid Infrastructure Challenges:
Microgrids and Transactive Energy
Tariffs as the solution**

Member of

- GridWise Architecture Council
- IREC Customer Grid Edge
- Energy Services Interface Task Force
- SEPA Transactive Energy Working Group
- SEPA Grid Architecture Working Group
- SEPA Microgrids Working Group
- Maine Climate Council
- Maine Utility Regulatory Reform and Decarbonization Initiative

System Transformation

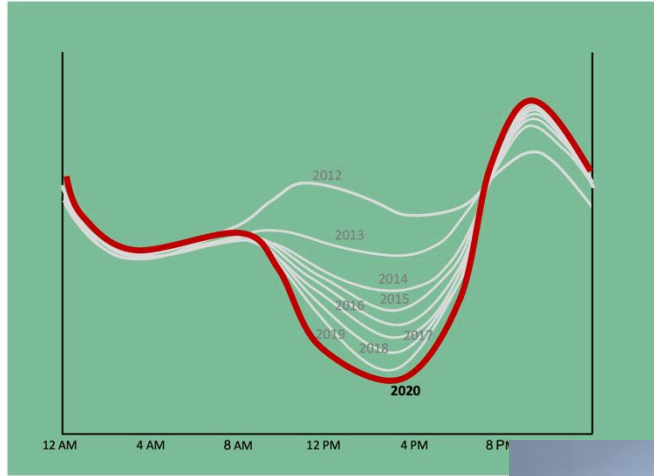


How do we navigate the energy transition?

We must strive to implement:

- Whole system/complex systems approaches
- Simpler structures to tame system complexity
- Scalability
- Adaptability and,
- Incremental change is no longer enough

Dynamics of Change



**Not just the
duck curve . .**



but a brood of duckling curves

Managing dynamic change?

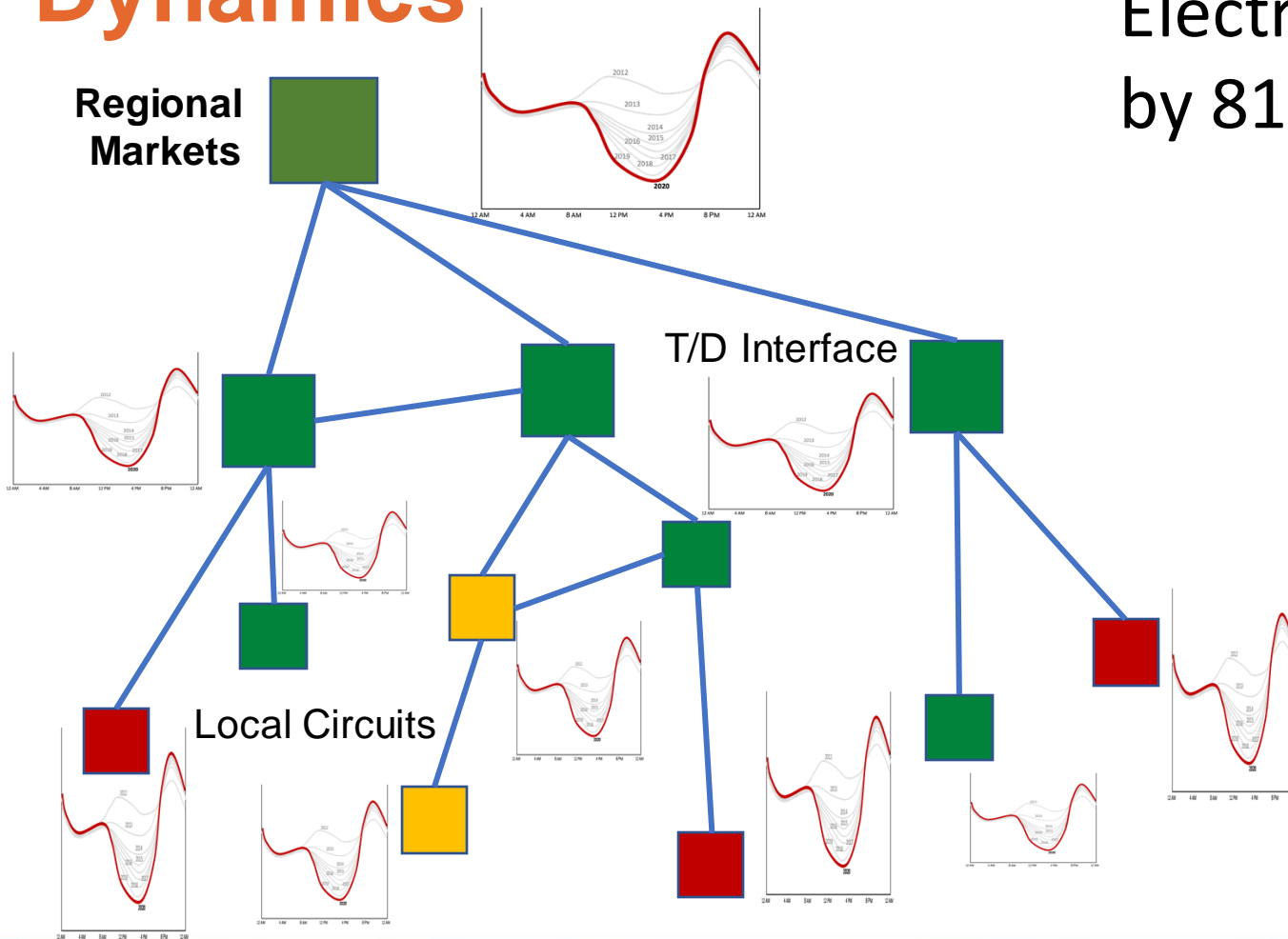
New system dynamics in multiple domains:

- Increased temporal dynamics
- Increased locational dynamics
- Accelerating evolutionary dynamics and,
- Accelerating technology and business dynamics

Temporal/Locational Dynamics

The Dynamics of Electrification

Electrification will increase system load by 81% and peaks increase 2 to 3X:

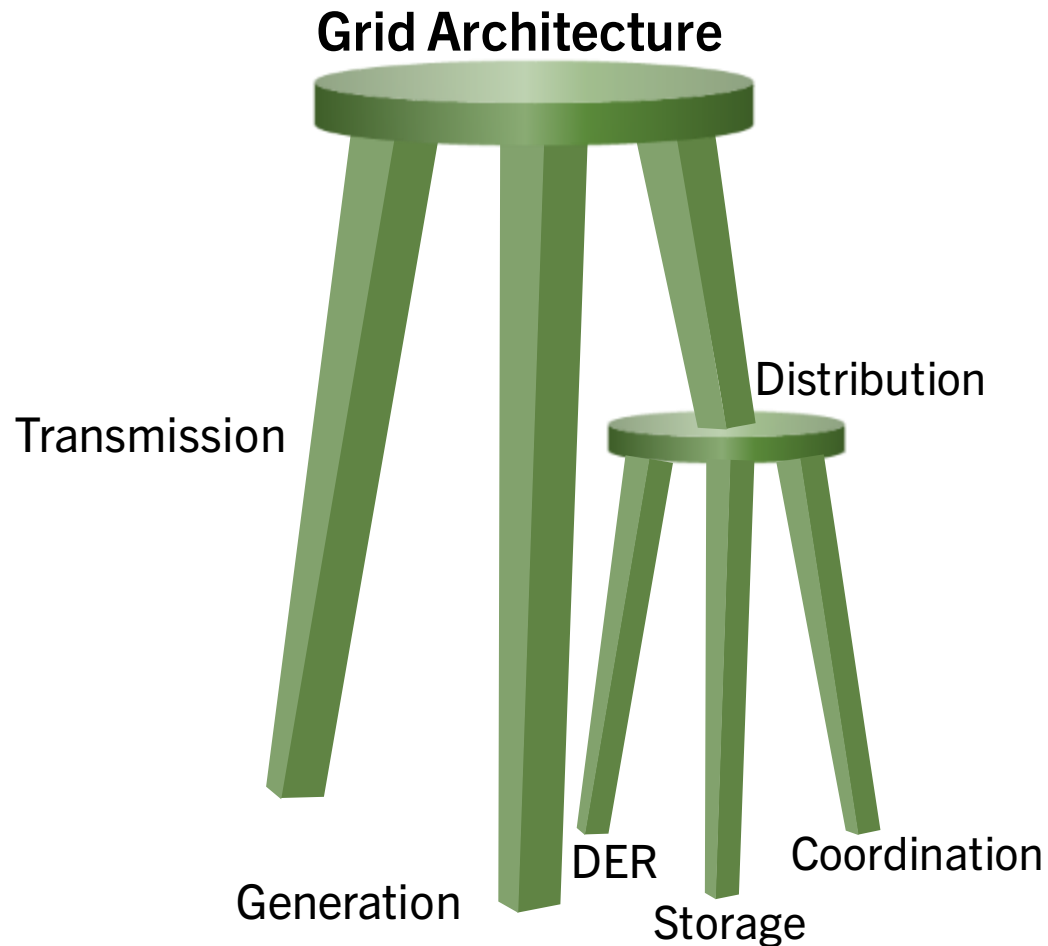


Local constraints and local grid services will become increasingly important to system stability

Infrastructure Costs

The 10 Trillion-dollar Challenge

Distribution Grid upgrades are estimated at over 10 to 30 Trillion over the next 20 years in wires, poles and transformers have been suggested.



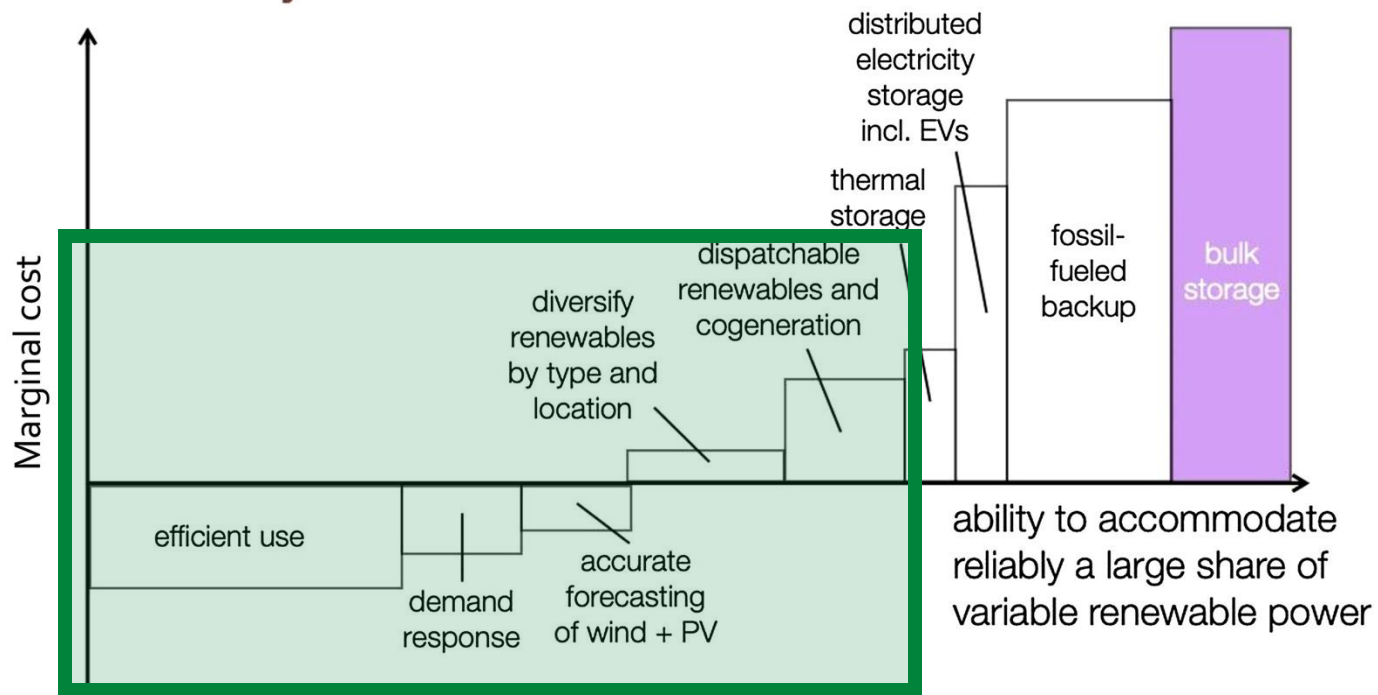
Local Resources

Local Grid Flexibility

Local grid flexibility is the most affordable alternative to the temporal and locational dynamics on the distribution grid

Grid flexibility resources

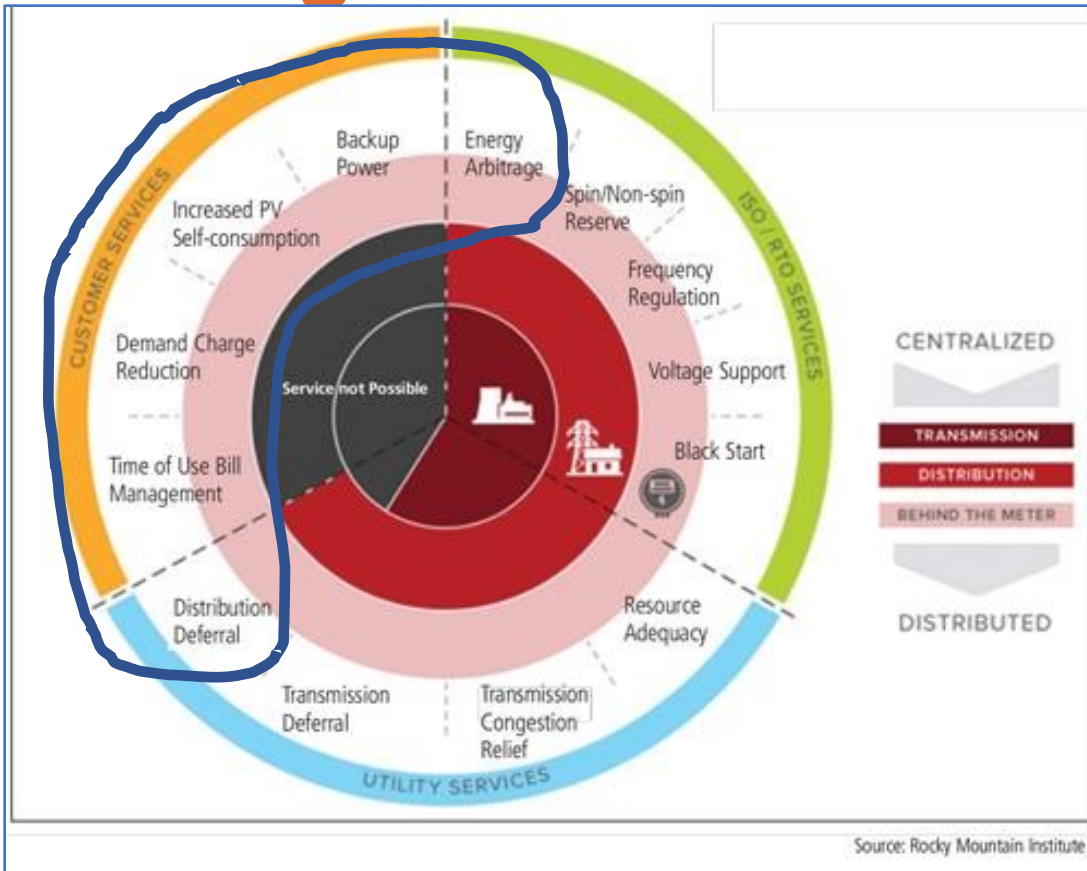
(all values shown are conceptual and illustrative)



(hydrogen storage not shown because its quantity is indeterminate)

Source Amory Lovins as attributed by Faruqi, 2020

The Business Case for Microgrids



- Provide a range of services
- Evolve with time and technology
- Are local
- Are scalable
- Are secure and private

Microgrids providing local grid services become increasingly important to system stability

Principals of a Good "Microgrid" Tariff

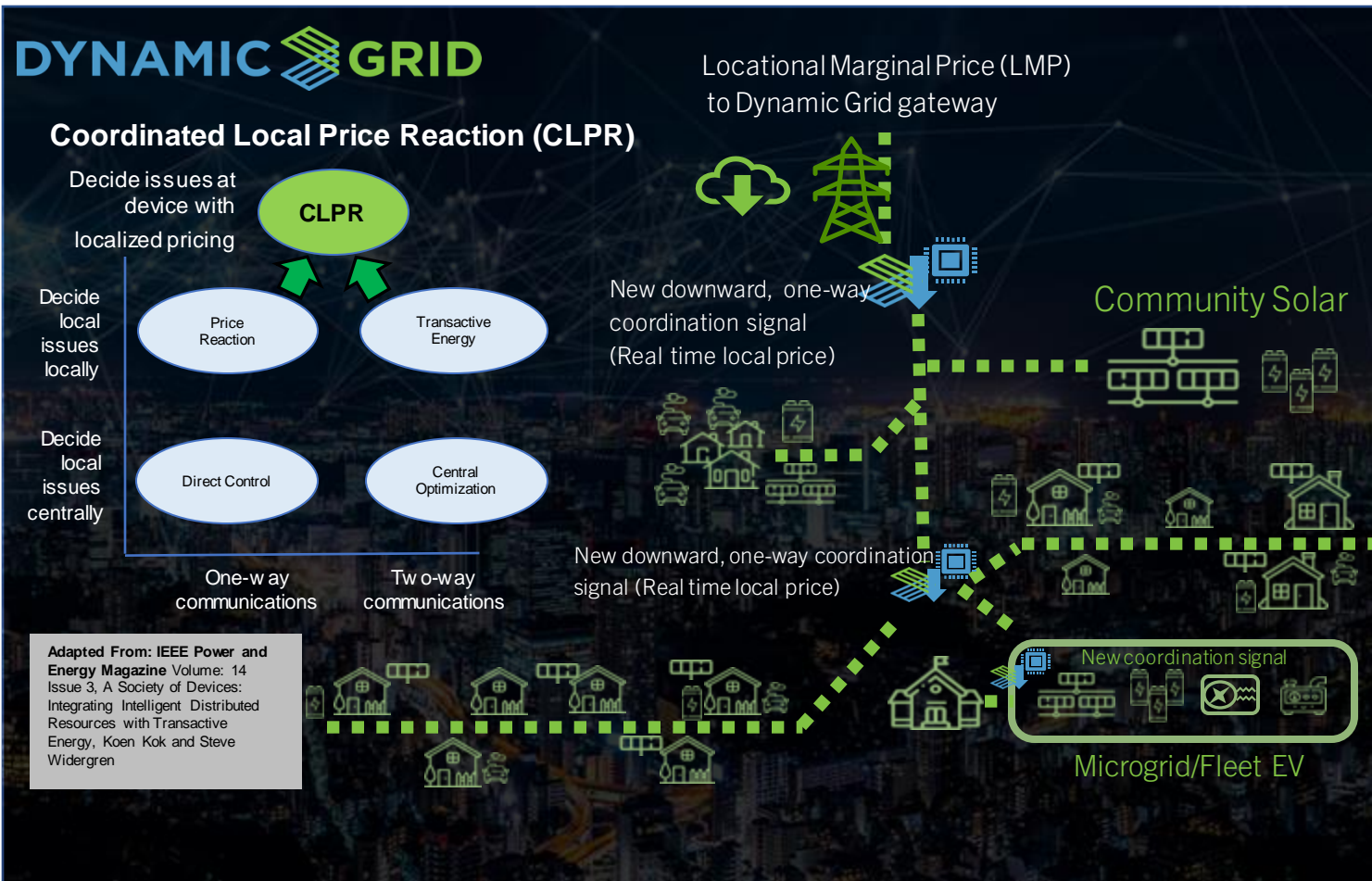
Operational whole system coordination is needed that is scalable, secure, private and affordable

- All assets are treated equally
- Open access
- Temporal and locational performance valued
- Consumers treated fairly
- Local system benefit compensated for locally
- Tariff is transparent

One Transactive Energy Solution

Coordinated Local Price Reaction (CLPR)

A grid of loosely coupled layers with local distribution prices and responding to multiple local value streams



Questions (hold for the panel discussion)