# Utility Business Model Reform and Distribution System Operation

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# Utility Business Model Reform
# and
# Optimal Distribution System Operation

## Why do these things matter?

## How does Community Energy fit in?

## What changes do we need to make?

# The whole story in 2 slides: (1) our situation

Given:

- The current status & trajectory of climate & ecosystem disruption
- The crucial role of energy as both a major cause of the disruptions and a basic necessity of life

We need to pursue two major goals, in parallel and with urgency:

1. Stop making things worse => adopt sustainable energy practices => decarbonize, electrify, reduce & displace fossil fuel use
2. Prepare for impacts of damage already done => resilience

Both goals require local action:

- We decarbonize society through local planning & initiatives:
  - Housing density, zoning & land use, building codes, mobility services, local economy, local food, urban forests & habitats, equity & care for disadvantaged & vulnerable people & communities …
- We enhance resilience through local electricity systems:
  - Disruptive impacts are always local
  - Community energy (solar + storage), microgrids on critical facilities

# The whole story in 2 slides: (2) what we need

California has adopted strong policies & targets for decarbonization & clean energy (SB 100)

**What's still missing?**

- State-level policy commitment to resilient communities everywhere
- Systematic statewide empowerment of local action on energy, decarbonization and resilience

What do we mean by "empowerment of local action"?

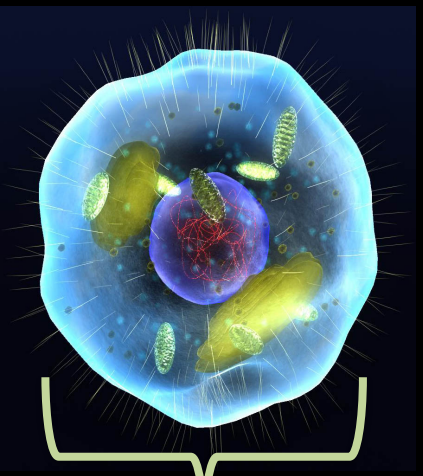
**=> Integrate urban/county planning with electric system planning**

1. Create a state-level structure to fund & support local governments to plan & implement Advanced Community Energy (ACE) systems
   - Advance state policy goals
   - Address local priorities
   - Support the electric power system

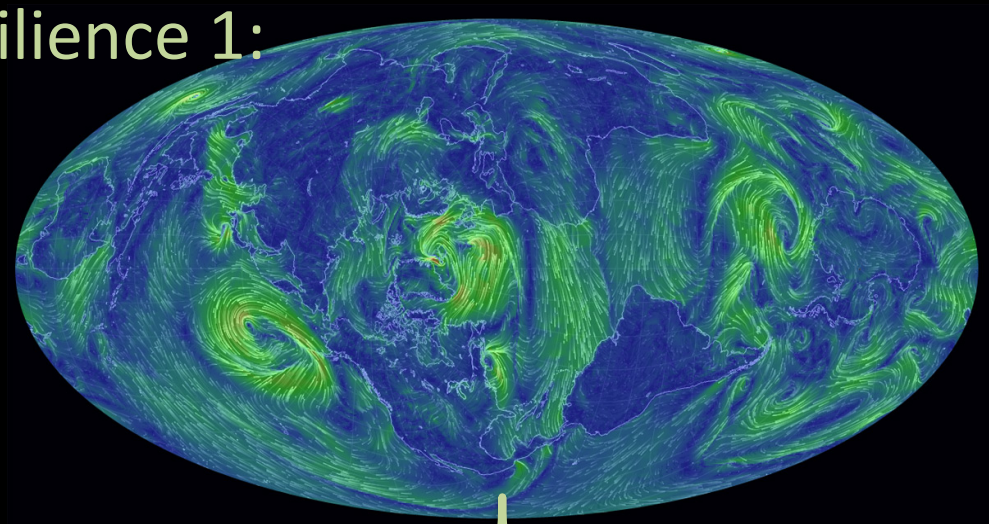
   } **Align 3 criteria**

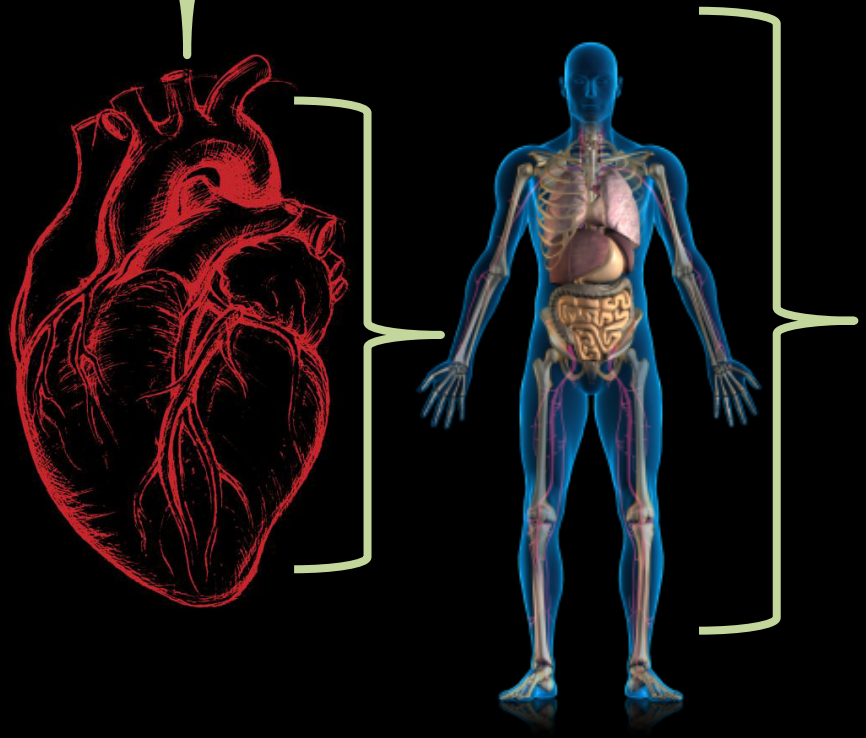
2. Reform IOU business model & incentives to focus on distribution system operation & to work as partners with local governments

# Layered Architecture of Resilience 1:



Nature's layered architecture of complex living systems





# Layered Architecture of Resilience 2: "Resilient Community" policies and strategies

**Household**
* Personal health
* Energy efficiency
* All electric
* Smart charging
* Minimal waste
* Grey water
* Low-water landscaping
* Micro-habitats

**Neighborhood**
* Food production
* Car shares
* Tool libraries
* Places to meet, gather & celebrate
* Community energy systems
* Rainwater capture
* Tree canopy & PV in healthy balance

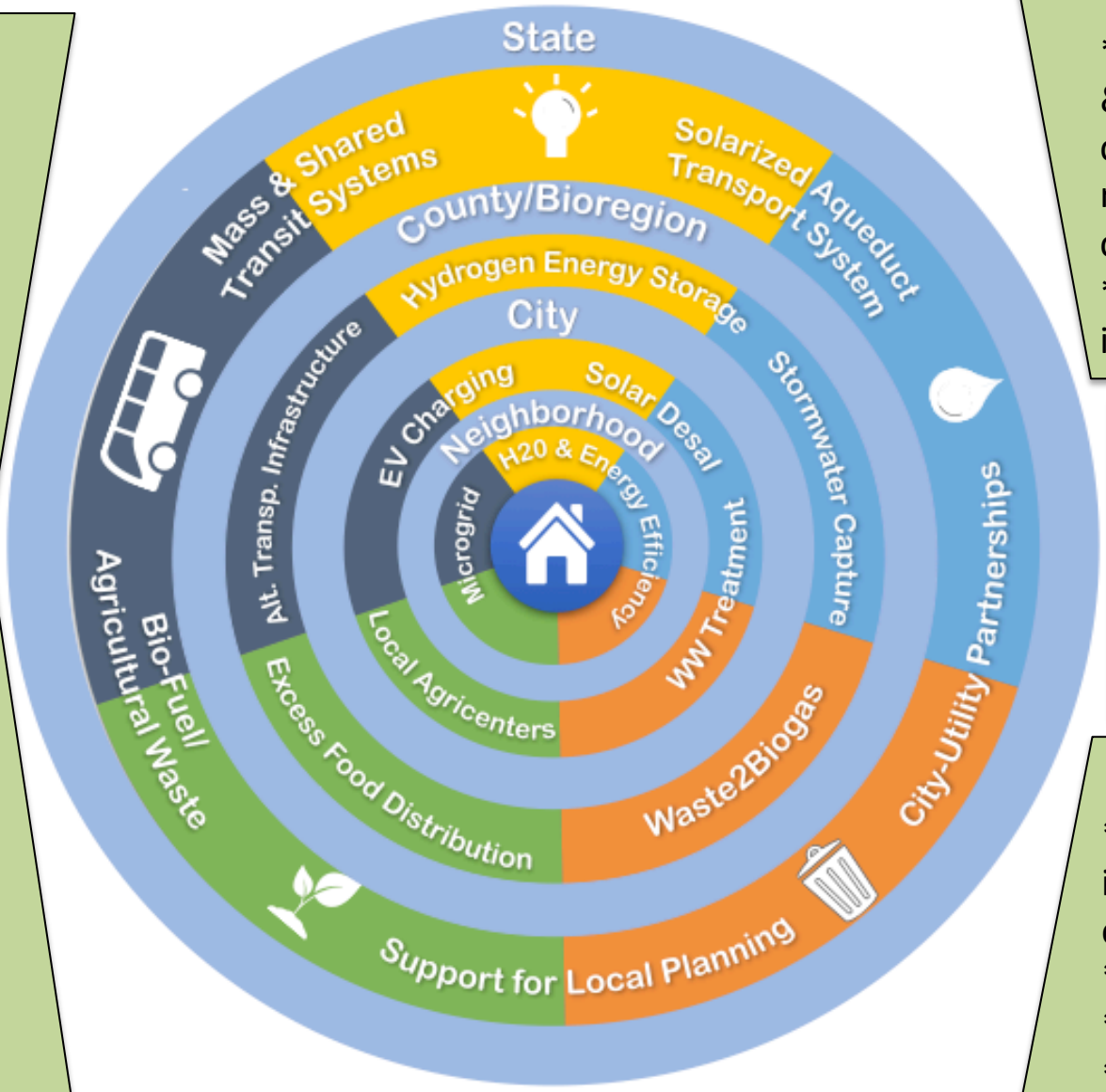



Image courtesy of World Business Academy
Santa Barbara, CA

**State**
* Policy, funding & structure for community resilience & local capacity building
* No community is left behind

**Bioregion**
* Local food
* Waste mgmt
* Water mgmt
* Ecosystem protection

**Municipality**
* Whole-system integration of critical services
* Public spaces
* Local business
* Vital, engaged neighborhoods

# Advanced Community Energy for all communities

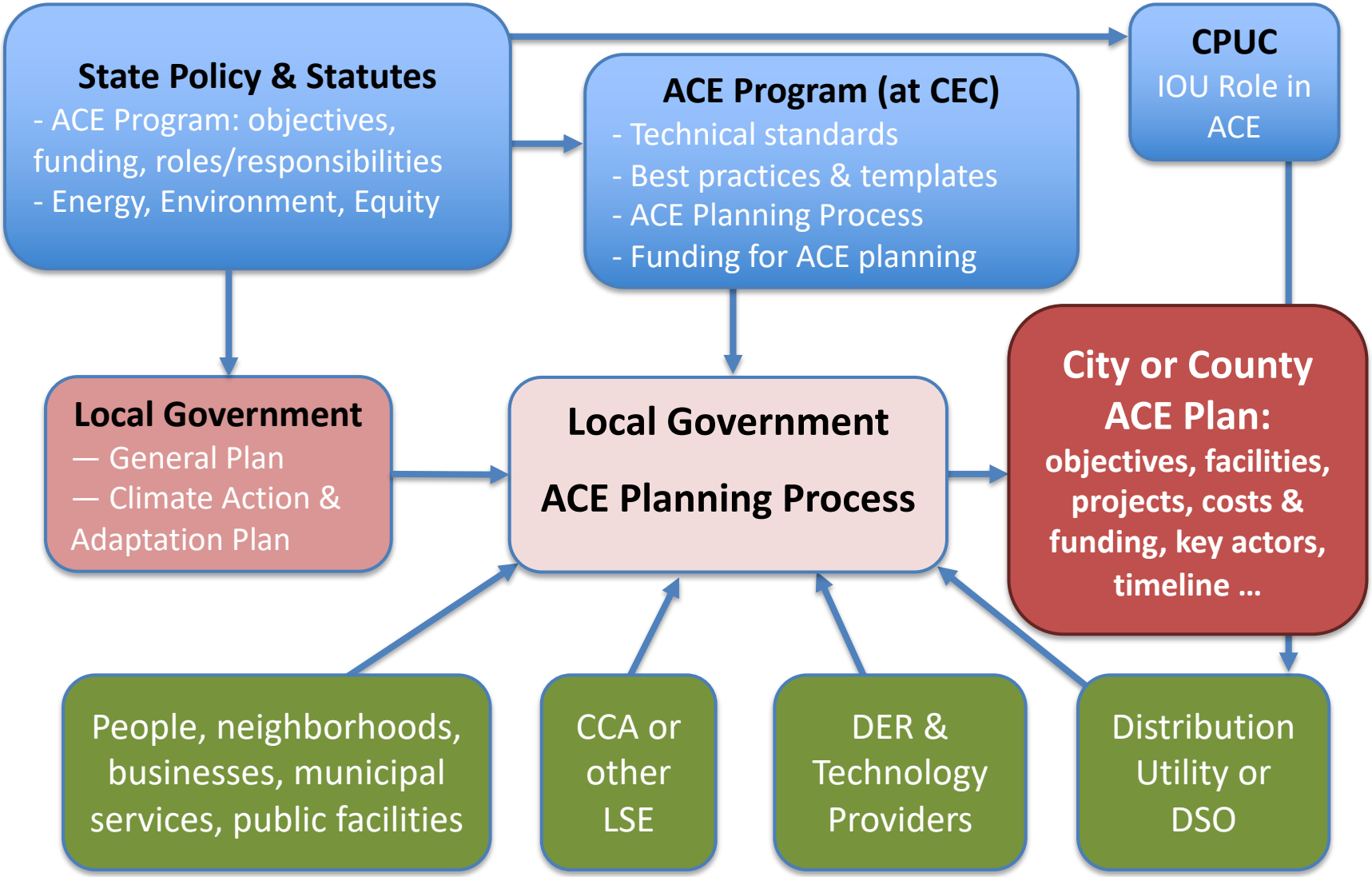
Definition: Advanced Community Energy (ACE)

1. ACE is a physical system of local electricity resources within a city or county, designed for the goals described below
2. ACE is a statewide program to plan and implement local ACE systems in all cities & counties in the state

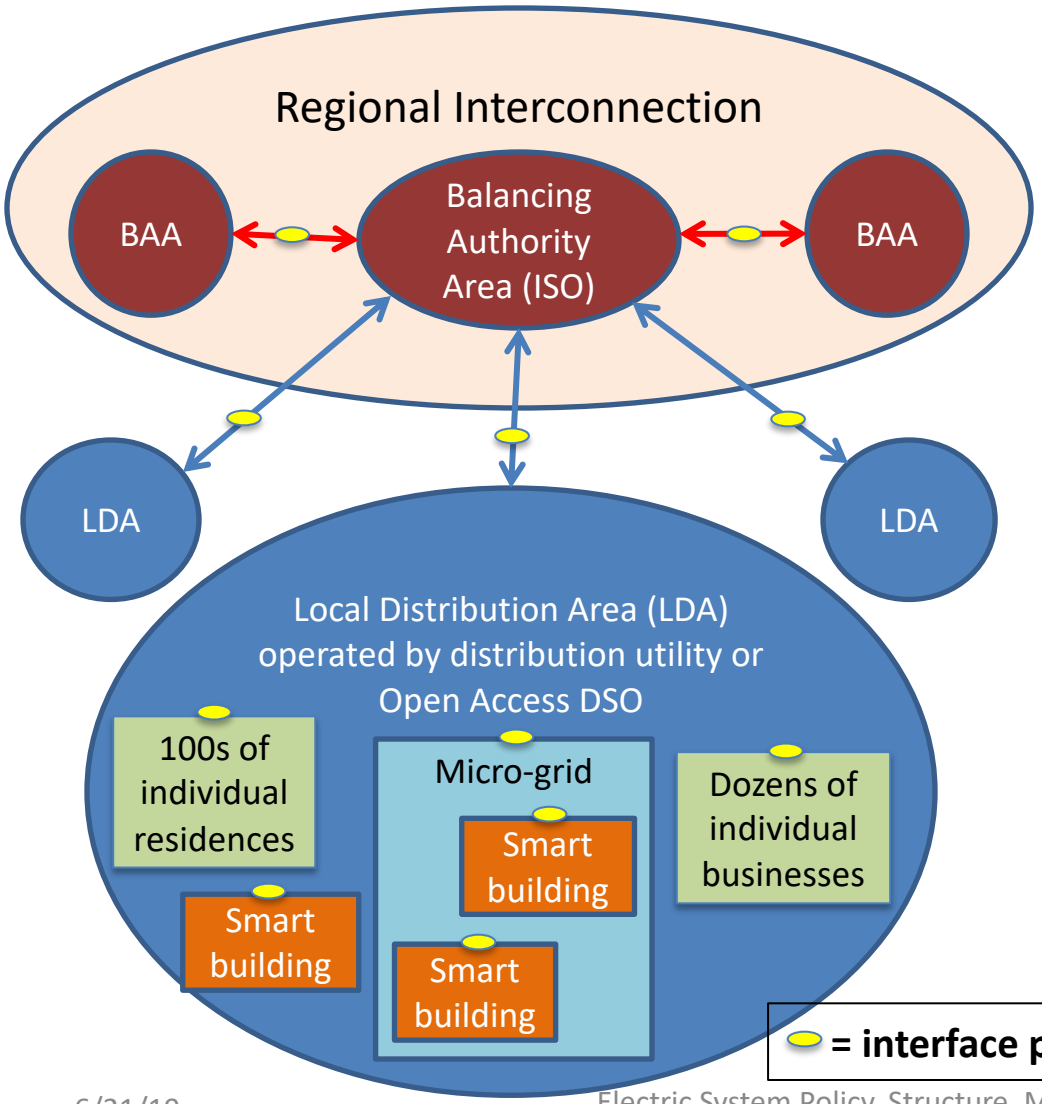
Legislative objective: Create a statewide program to empower, fund and work with all cities & counties to plan & implement ACE systems to achieve three goals:

A. Align with and contribute to state policy goals for clean energy, decarbonization, resilience, equity, and …
B. Address high-priority local benefits & local needs (such as jobs, resilience, needs of vulnerable communities)
C. Provide benefits to the electric power system; support reliable grid operation & reduce infrastructure costs

# ACE planning is a structured collaborative process, set in motion & funded by legislation



# Layered Architecture of Resilience 3:
# Define power system roles & responsibilities for high DER




Open Access Distribution System Operator is an essential new model for IOU distribution utilities

- Rooftop solar, storage, and controls on premises can make a prosumer or building microgrid – a participant in a network
- Bulk power system moves electricity from solar/wind-rich areas to load centers
- *Each layer only needs to manage its interfaces with next layer above & below*
- Each layer can "island" from layer above at the interface point
- Fractal structure mimics nature's design of complex organisms & ecosystems.

# Transitioning today's IOU distribution utility to a "wires-only" 21st century Open Access DSO

Guiding principles for an OA-DSO

- Create a market framework to facilitate growth of local energy resources (DER) of various scales & types, and third-party DER providers
- Collaborate with local governments & their energy procurement agencies (CCAs) on ACE planning & implementation
- Define boundary of DSO functions & assets based on "natural monopoly" (poles & wires; system operation; transparent grid services markets)
- DSO should not engage or invest in competitive, evolving technology innovation areas — privatize technology risks, don't rate-base them
- Ensure reliable, safe, affordable electric distribution service
- Focus on resilience for more volatile, extreme climate events => layered architecture
- Tie DSO financial incentives to performance of distribution services & community collaboration (performance-based regulation or PBR)

# Regulatory framework for an Open Access DSO:

1. Open-access, non-discriminatory service (analogous to ISO) involves planning, interconnection, real-time operation & markets
2. Create an open, participatory distribution planning process where 3rd parties can provide DER-based non-wires solutions
3. Define grid services that DER & "prosumers" can provide & be paid for; procure services through transparent market mechanisms
4. Streamline interconnection for elements of ACE plans
5. Adopt transparent operating procedures to curtail or modify DER activity to manage real-time distribution system conditions
6. Adopt a data access framework that protects privacy & security while enabling all the above activities
7. Unbundle utility distribution service ("wires-only") from retail load-serving function (LSE, procurement)
   - Update Provider-of-Last-Resort function
8. Coordinate planning, operations and markets with CAISO

# Summary for State Policy Makers

**Question:** How can California achieve the goals of SB 100, decarbonize the economy & society, & strengthen local resilience & equity … without empowered local governments & communities statewide?

**Answer: We can't!**

Therefore, Policy Makers, we request that you:

1. Formally adopt Resilient Communities as a statewide policy goal
2. Create & fund the ACE program as described
3. Require IOU structure change to separate electric distribution "wires" service under the Open Access DSO model
   a) Direct IOU DSO to partner with local governments on ACE systems
   b) Direct CPUC to develop OA-DSO regulations w/ performance incentives
4. Affirm the role of CCAs in implementing ACE systems & pass legislation to strengthen them (& don't pass legislation to strangle them)
5. Embrace and work with bottom-up-driven change. California's future depends on local initiatives for decarbonization & resilience.

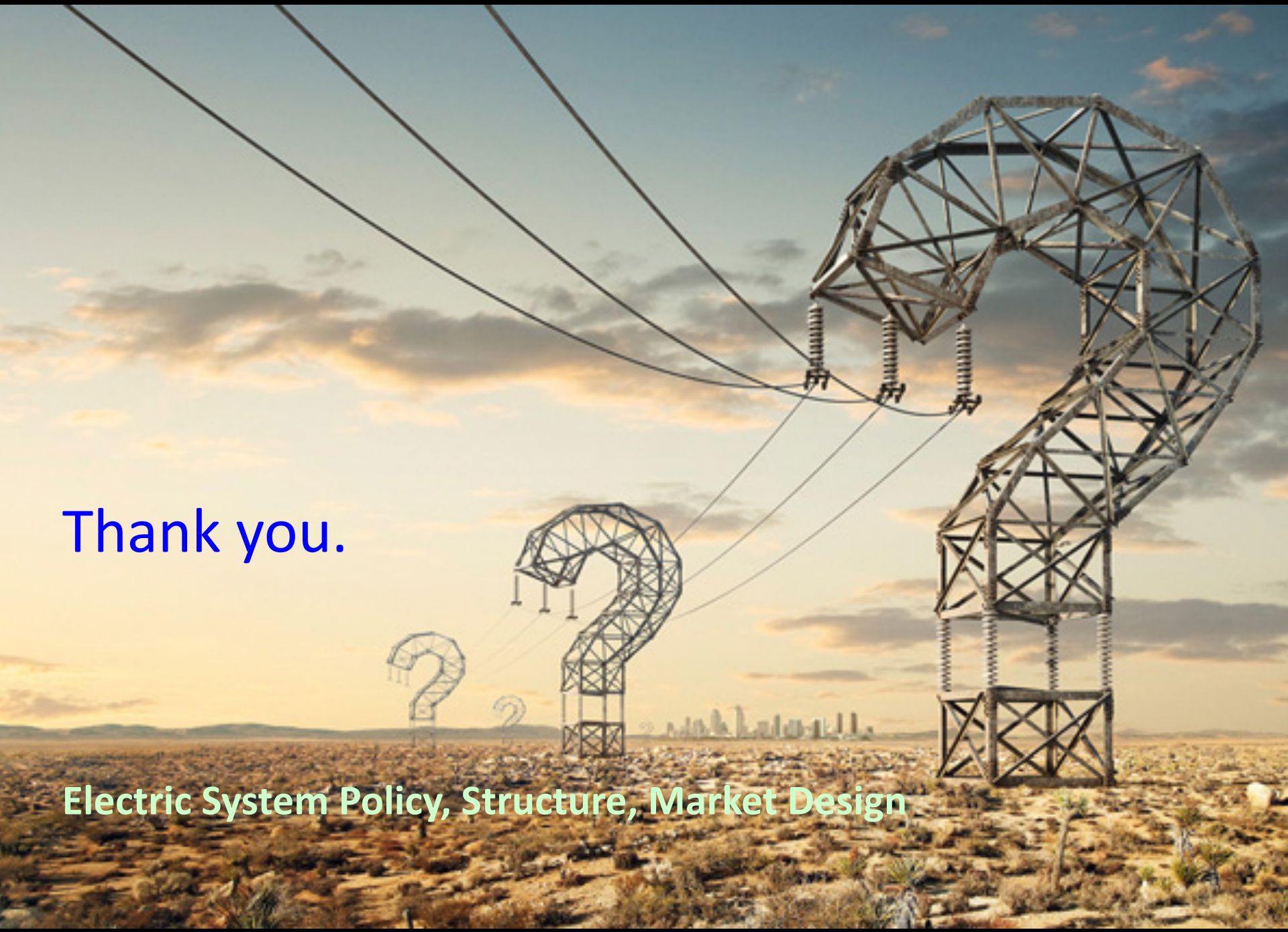
# What's next …

- "Resilient Communities" as a 21st century strategy for maintaining quality of life in a more volatile future and healing damaged ecosystems
  - Get more involved where we live
- A groundswell of support — coming from local governments — for a statewide program to develop advanced community energy systems
- Imagine & articulate non-polarized visions of the path forward

"If you want to make sure nothing gets done, convince people they're on one side or the other of a false duality." — attrib. to J. M. Greer

- *"In order to change an existing paradigm you do not struggle to try and change the problematic model. You create a new model and make the old one obsolete." R. Buckminster Fuller*

"We need a mental shift from predicting the future to creating the future." — W. Blake


Thank you.
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