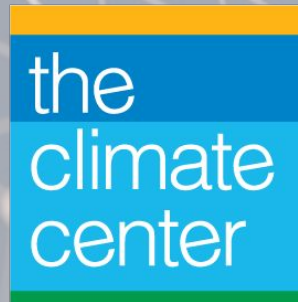


Leveraging Industry Trends to Build Climate Resilient Communities

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The societal context: A need for urgent action

- Climate & ecosystem disruptions are already severe & rapidly getting worse
- Impacts fall most heavily on vulnerable & disadvantaged communities
- Energy systems are a major cause of disruption, and yet, we can't do anything without energy

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

1. **Sustainability** => Stop making things worse => convert to sustainable energy practices => decarbonize, electrify, reduce & displace fossil fuel use
2. **Resilience** => Prepare for impacts of damage already done
3. **Equity** => Prioritize environmental and social justice; create a just energy transition

All three goals require local action

- Decarbonize society through local planning & initiatives:
 - Housing density, zoning & land use, building codes, mobility services, etc.
- Enhance resilience through local electricity systems & microgrids
- Ensure the resilience, health and economic benefits of local clean energy reach all people, communities and neighborhoods

The industry context: The power system is evolving from a centralized kWh delivery system to an interactive network

- End-use customers care about electricity services, not kWh
- It's no longer true that "All electricity must come from the grid"
- Scalable distributed technologies are in **direct competition with grid kWh** and create a new "**behind-the-meter market**" so that
 - Any customer can generate & store electricity & manage load with on-site devices
 - The grid & wholesale commodity market are becoming the residual supply
 - End-users can customize reliability, power quality, resilience, environmental attributes & cost-effectiveness, and can become **grid participants, not just consumers**
 - Local power systems can be optimized for a neighborhood, town or city
 - BUT ... institutional inertia & incumbent political power, combined with rising grid infrastructure costs & declining DER costs, incentivize **grid/load defection**
 - First movers will be financially capable C&I and affluent residential customers

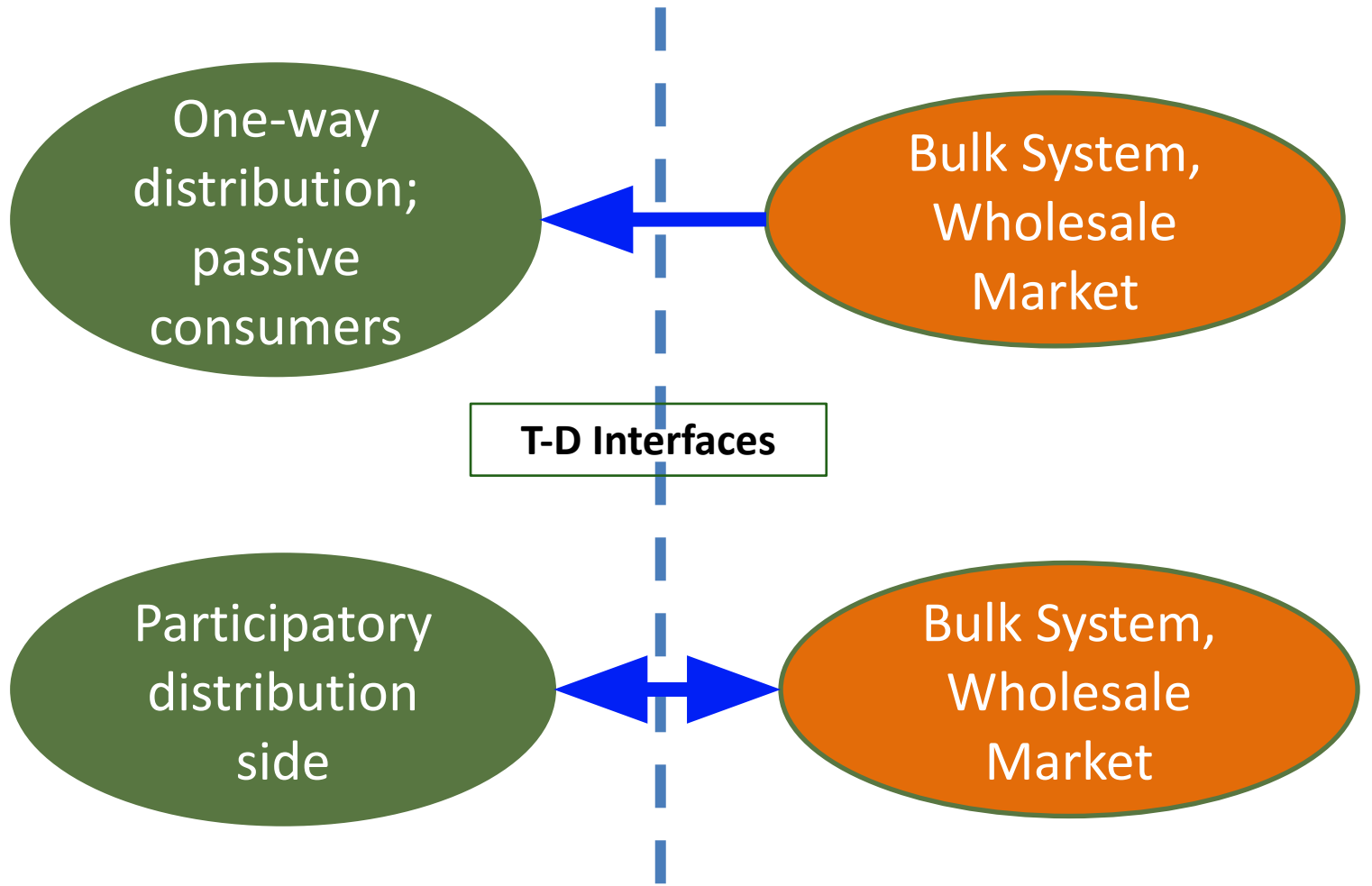
The electricity system is evolving to a “bimodal” structure with a vibrant, participatory distribution side

Legacy 20th Century Electric System:

- All supply is from the bulk system
- Distribution service is one-way
- Consumers only consume

Bimodal 21st Century System:

- Local resources supply a major share of new electrification demand
- Distribution network connects diverse customers & community resources
- Customers are grid participants, not just consumers
- Distribution operator manages local grid to reduce bulk system impacts



Policy vision: Statewide deployment of clean resilient DERs, microgrids, energy efficiency retrofits, demand management

Realizing the vision will provide diverse multiple benefits

- Resilience for future climate extremes
- More rapid decarbonization of power grid, building and transport sectors
- Well-paying jobs for economic recovery from Covid
- Community financial benefits from local resource ownership
- Attractive environment for private investment in the clean energy future
- Load profiles shaped to minimize adverse grid impacts

Three major legislative actions are needed

1. State support for local energy resilience **planning** => shovel-ready projects
2. Funding for **implementing** energy projects, prioritizing disadvantaged communities
3. Form **Open Access Distribution System Operators** from existing IOU distribution utilities, to provide the network platform for participating customers & DERs



Thank you.

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