NATIONAL COUNCIL
ON ELECTRICITY POLICY

Annual Meeting 2019

Evolving Transmission, Distribution, and Customer System Coordination

Wednesday, September 11 –
Thursday, September 12

Austin, Texas

Physical System & Operating Essentials

Chris Villarreal, Moderator

Paul Duncan

Paul Alvarez

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The What and Why of C-D-T Communications

Panel on “Communications Across the Grid”

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Electric System Policy, Structure, Market Design

National Council on Electricity Policy, Annual Meeting 2019
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The electric power system is evolving from a commodity delivery system to an interactive network.

- End-users care about energy services, not kWh
- Scalable technologies create a new “behind-the-meter market”
  - End-users customize reliability, quality, resilience & cost-effectiveness
  - The grid & wholesale commodity market become the residual supply
  - Resisting the evolution & rising infrastructure costs may drive customers to defect (first movers will be larger C&I and affluent residential customers)
- Instead, we can enable every POI (end-users, DERs & aggregations) to become a grid & market participant
  - DERs offer cost-effective substitutes for grid infrastructure
  - Flexibility services from inverter-based DER, hybrid resources & microgrids can eventually eliminate need for conventional generation
  - DERs can smooth variability at the source rather than export to the TSO

An overlooked (until now) arena of energy transition activity is urban planning.

Cities across the country are taking initiatives to reduce GHG emissions and become more resilient to severe disruptions

- Decarbonization must address the factors that produce GHG:
  - The stuff of urban planning: housing density, zoning & land use, all-electric new building codes, electric mobility services, transit-oriented development
- Resilience is enhanced with local electricity systems:
  - Disruptive impacts are local => loss of critical services; threats to life
  - Community energy resources, microgrids on critical facilities
- Electrification of fossil fuel uses increases electricity demand, changes load shapes, & can challenge grid operations unless orchestrated

Yet today, urban planning and power system planning are separate siloes.

Key policies, following principles of grid architecture, can facilitate energy transition for greatest societal benefit.

- Enable customers to participate in the network rather than defect
  - Create a framework & implement necessary technologies for customers & DER providers to transact & be compensated for grid services
    - Customers/DERs need predictable revenue streams & clear rules
    - DSOs need the tools to operate their systems reliably with high DER
    - TSO needs confidence that dispatched DERs will deliver in real-time
- Integrate urban planning and power system planning
  - Structure & incentivize collaboration between distribution utilities (DSOs) & local governments to develop local energy systems to meet 3 goals:
    1) Address local priorities, such as resilience, local jobs, efficient buildings, etc.
    2) Advance broader decarbonization/electrification/equity goals
    3) Support grid operations and infrastructure investment deferral

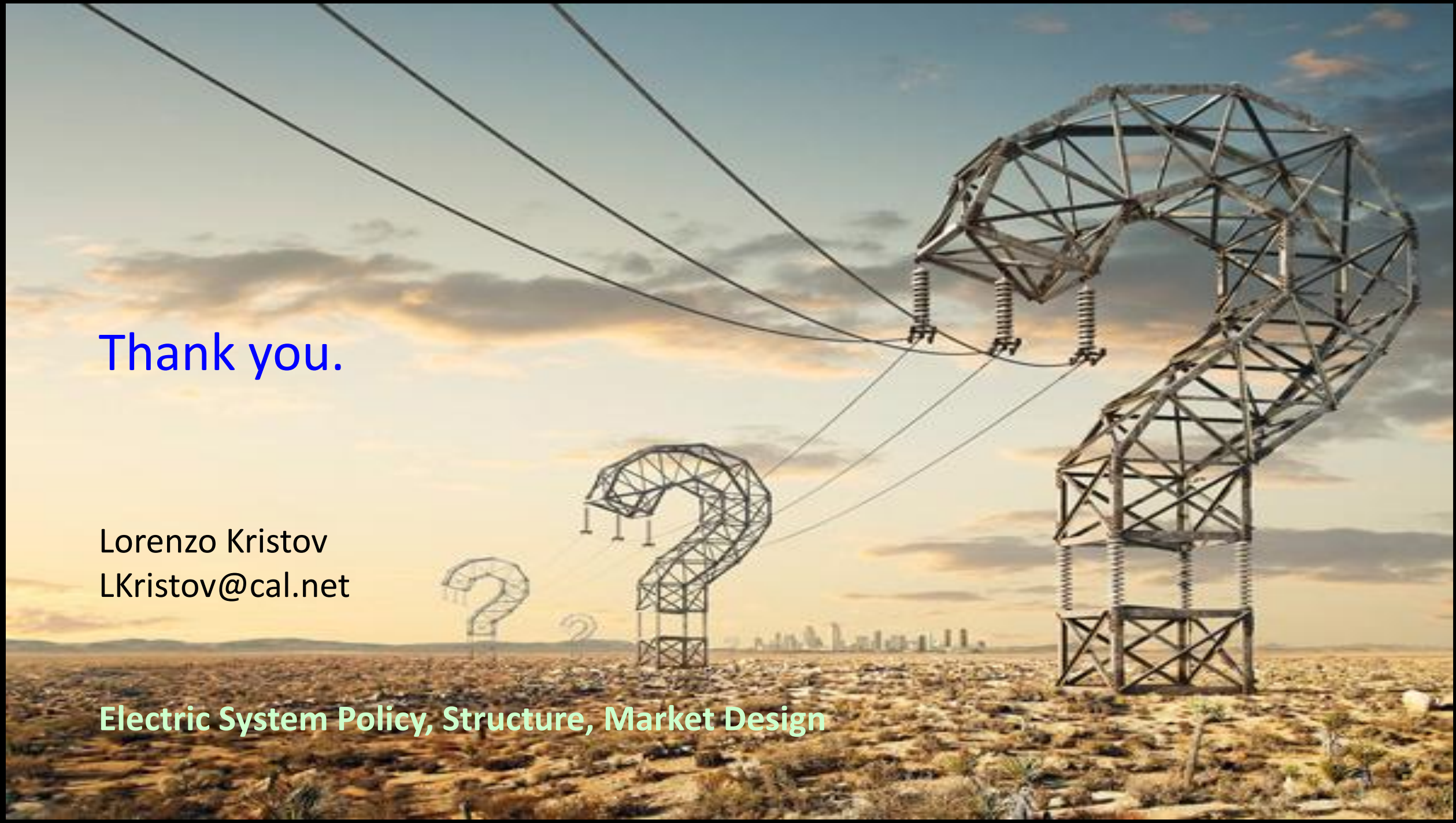
Clear policy objectives then drive the communication needs.

Operating time frame

- C/DERs need to know about current distribution conditions that will constrain their provision of services
- DSOs need to know about TSO dispatches of C/DERs, and which C/DERs are available to support distribution operations
- TSO needs to know when participating C/DERs are distribution constrained
- TSO & DSOs need accurate short-term forecasts of net load at T-D interfaces & at key distribution circuits/substations
- TSO & DSOs need to know how dispatch response of a DER aggregation will be distributed

Planning time frame

- C/DERs need T&D planning data to develop NWA & grid-friendly resources
- TSO & DSO need methods to estimate DER growth scenarios & forecast DER impacts on net load


Thank you.
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