

The Increasing Importance of Integrating System Planning

Breakthrough Energy/ESIG/GPST
Integrated Planning Workshop

Providence, Rhode Island

October 21, 2024



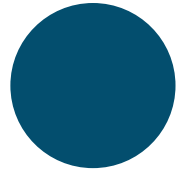
Energy+Environmental Economics

Arne Olson, Senior Partner

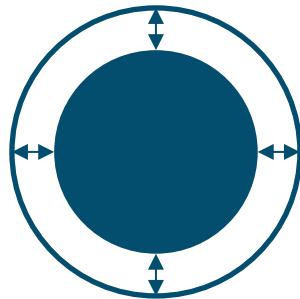
The energy transition will require massive investments in electricity systems

Decarbonization will require massive investments in the U.S. electric system

>\$2 trillion
2025-2035



\$3-6 trillion
2035-2045



Many forces are driving high investment needs over the coming decades

- Decarbonization of power system
- Electrification
- Industrial and data center load growth
- Aging infrastructure
- Wildfire risks

Source: Princeton Net-Zero Carbon America Study

This creates opportunities and challenges for meeting planning goals



Reliable



Affordable



Clean



Equitable



Need to ensure that planning identifies

- The right investments...
- in the right locations...
- at the right times

System planning should be customer-centric

+ Customer energy needs are growing rapidly

- Large industrial and data center loads
- Electrification

+ Customers are adopting technologies that can provide flexibility to the system

- Electric vehicles
- Smart thermostats
- Storage

+ Customers want choice!

- Manage bills
- Onsite and offsite renewable generation
- Programs and rate plans



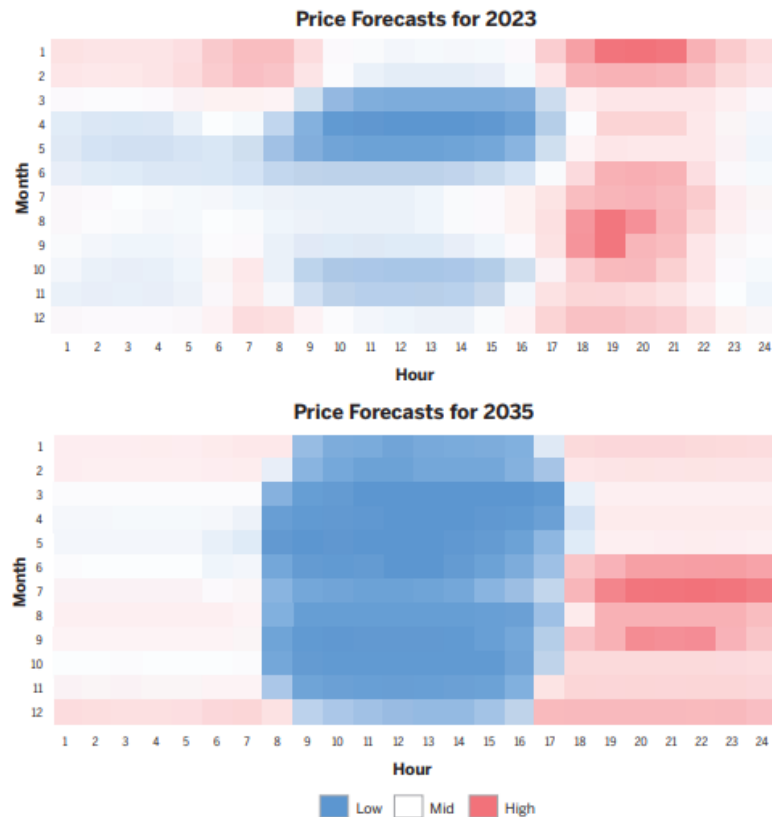
Customers & DERs



Generation and customer/DER planning should be integrated

Average prices in 2023 and forecast for 2035

CAISO SP15 zone



Generation

&



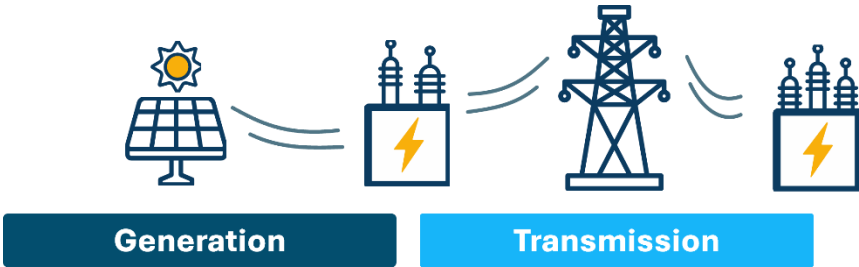
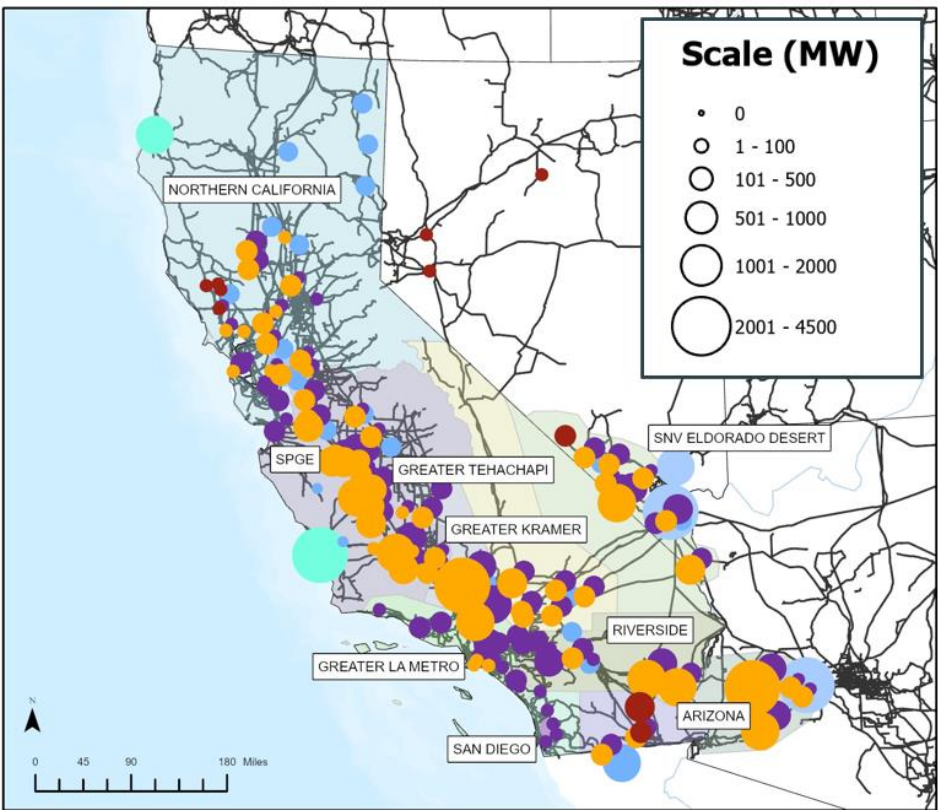
Customers & DERs

Utility-scale generation, customers, and DERs all have a role to play in the energy transition

- Customer actions and DERs can reduce the need for system investments
- The cost and availability of utility-scale generation (and transmission) impacts the value of customer actions

Generation and transmission planning should be integrated

CPUC IRP Resource Additions by Substation 2024-25 Transmission Planning Process, 2039 Snapshot

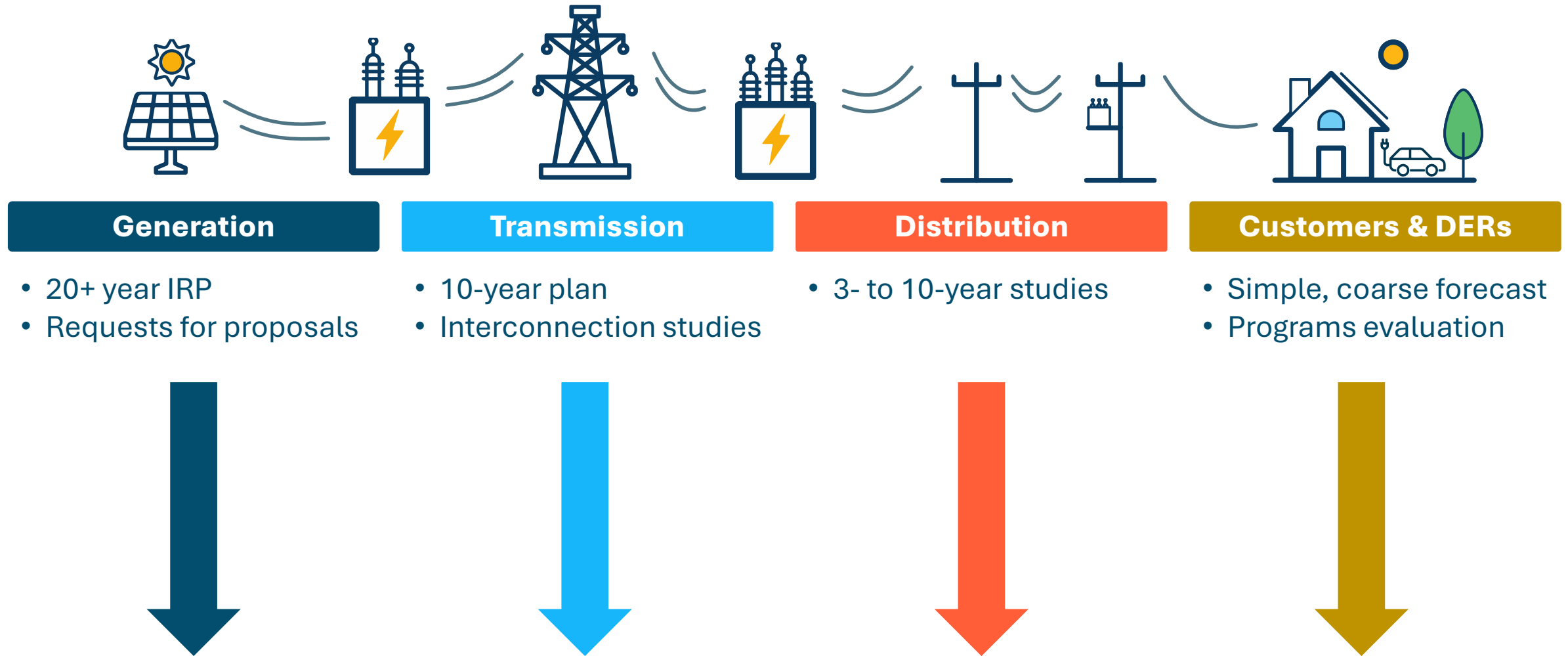


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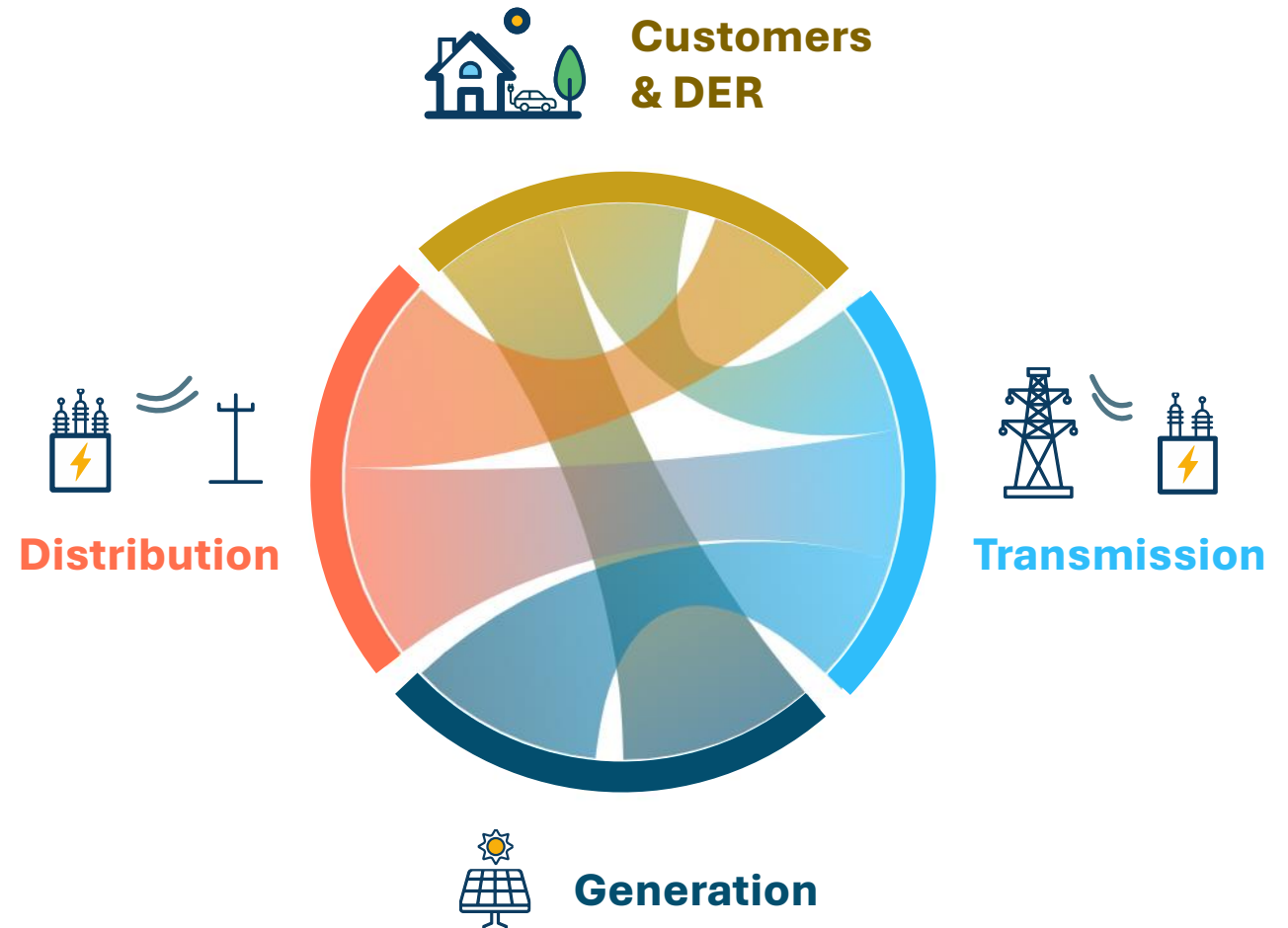
- Significant amounts of new resources need to be integrated onto the transmission system
- Existing transmission and future transmission options—including for remote renewable resources—should inform which generation resources are added and where
 - Resources, such as storage and local renewables, can be sited to reduce or mitigate transmission needs

System planning is largely siloed today



Integrated system planning considers the system as a whole

The goal of integrated system planning is to **harmonize planning processes** to ensure that investments are optimal from a **system-wide planning perspective**



Integrated system planning is not just about utilities



Utilities

Harmonize planning across all parts of the system



Regulators

Ensure system planning considers a holistic perspective



Developers

Anticipate system needs and favorable locations for projects



Stakeholders

Allows transparency + input on how the entire system is planned



ISOs/RTOs

Proactively plan transmission to get ahead of grid needs

Thank You!

Arne Olson, Senior Partner

arne@ethree.com



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