

APPA Business & Financial Conference

California's Quest to Decarbonize and the Impact on the World... And YOU!

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In Conclusion...

- Watch California
- Learn from our mistakes
 - Gift that keeps on giving
- Be financially aware
 - Don't say “no” to everything
 - Do analyze for your community
 - Do pilot & test regularly
- Do what works for you



Question



Good News

- We're not *all* crazy
- Utility people are *surprisingly* similar to those everywhere
 - Reliability
 - Affordability
 - Sustainability



Bad News

- We're surrounded by a lot of crazy people!
- Actually, not “crazy” – we could *all* say that about our hometown
- Majority of California:
 - Highly motivated to decarbonize the planet
 - Driver: Can see the climate changing year to year
 - Our leaders are in charge of statewide policy and taking action
 - Generally... Environmental issues prioritized over affordability



You Benefit

- **Pioneer mentality**
 - **Go West!**
- **State of ideas**
 - **If it doesn't exist, California is eager to create it**



California is a Nation-State

- **\$2.5 trillion economy (#5 in world)**
 - 14% of the United States GDP
- **Net migration 103,500 per year**
- **Housing 50-100% above national average**
- **Largest farm-state**
 - Central Valley is U.S. bread basket
- **Forbes: Cost of doing business 12% above national average**
 - #43 in business costs
 - #4 in economic climate

Energy Policy is Jobs Policy

- Clean energy jobs drive the California Renewable Portfolio Standard (RPS)
 - 500,000 jobs in clean energy
 - 300,000 energy efficiency
 - 153,000 solar industry
 - 4,600 wind energy
 - *Source: Advanced Energy Economy Institute: California Jobs Report, 2016*
 - **Strong unions** fight for these jobs, and to expand them with higher RPS goals
- Coal jobs nationwide = 51,000



Price Problems Are Growing

- **CA has higher rates, but milder weather – in many areas**
 - **Central Valley very hot**
 - **Bills high – Affordability concerns growing**



Activist Government

CMUA is the voice of California public power and water
150 energy bills ✦ 150 water bills ✦ multiple rulemakings



**CALIFORNIA
ENERGY
COMMISSION**

**California
Public Utilities
Commission**



California State Legislature



CalEPA
California Environmental
Protection Agency



https://en.wikipedia.org/wiki/File:Seal_of_California.svg



CMUA
CALIFORNIA MUNICIPAL UTILITIES
ASSOCIATION

Activist Government

Regulation fails when...

...it is not ambitious enough.

**Martha Guzman Aceves
CPUC Commissioner**

Did You Notice?





SB 100 – 100% Clean Energy by 2045

- **60% Renewable Portfolio Standard by 2030**
 - No large hydro power
- **40% Carbon-Free power by 2030-2045**
 - Large Hydro – bill silent, but probably
 - New nuclear – unlikely for CA, but perhaps small modular reactors if waste can be addressed
- **Prediction: You will see this concept expand nationwide**
 - Maybe not up to 100% but interest will grow
 - Balance with reliability & role of natural gas



SB 100 – 100% Clean Energy by 2045

Opponents of change have always said higher levels of clean energy would be too expensive or a threat to reliability, and have always been wrong.

They will be wrong again.

California Senator Kevin de León
Strong belief in new technology



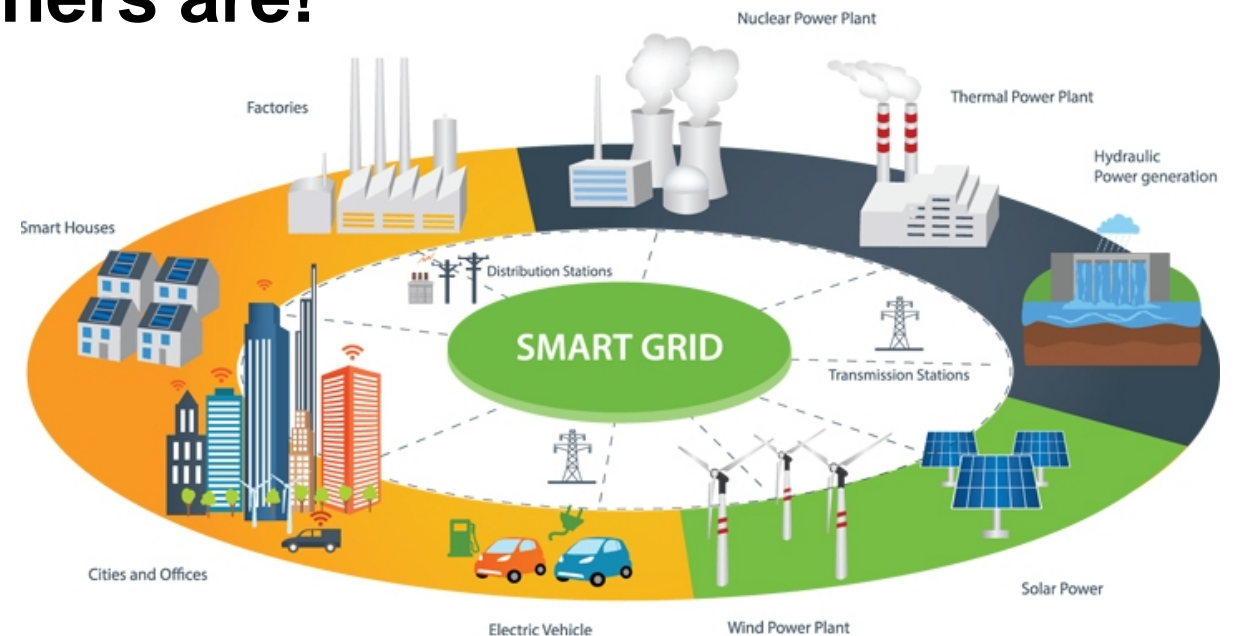
Electric Vehicles

- If you are NOT investigating EVs, it's opportunity lost
- Electric vehicles will grow from 3 million to 125 million by 2030, International Energy Agency forecasts
 - Top way to decarbonize
 - Load growth
- Greatest hurdle
 - Charging Infrastructure
 - Chicken *before* egg



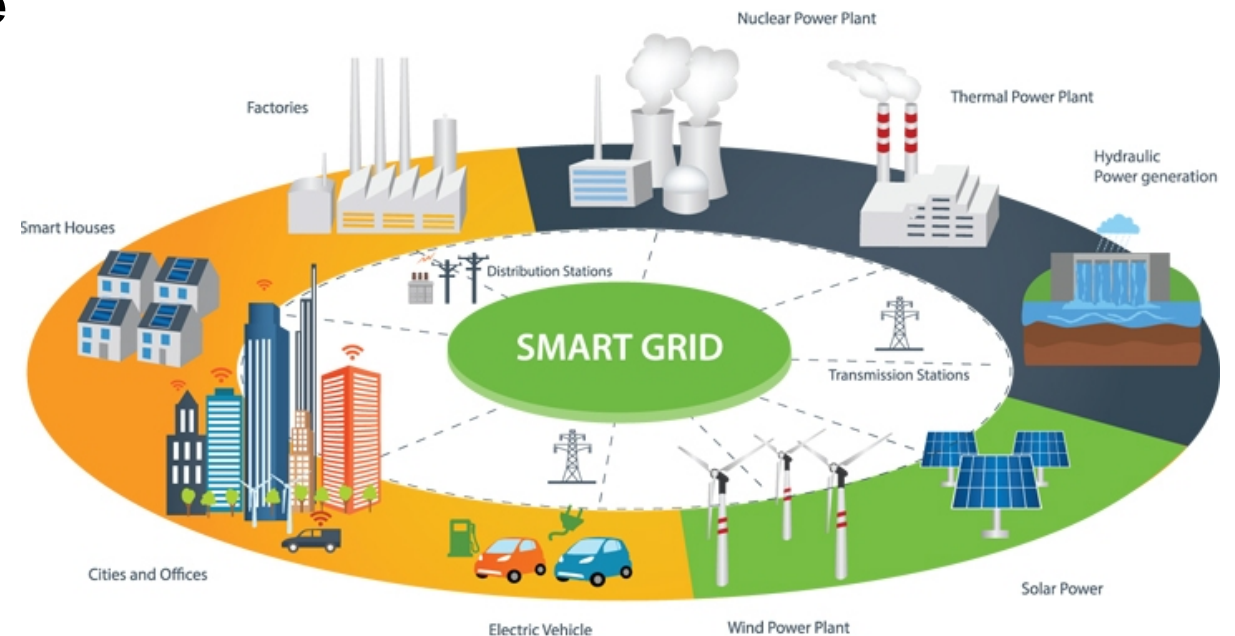
Distributed Energy Resources

- Options growing for customers
 - (CA – solar on every new house starting in 2020)
 - Community solar option
- Engage with customers – Others are!
- “*Your*” customers?



Distributed Energy Resources

- **Reliability is still King**
 - Differentiates DERs from being grid-connected
 - **Batteries, Batteries, Batteries**
 - In CA, only 80% of the way there
 - Need spinning mass
- **With variable renewables, already moving toward capacity-based rates**
 - Already there on water



Talk About Price & Affordability

- **Public Power is Consumer-Owned**
 - Balance price with investment, value & affordability
- **Be the laboratory of innovation**
 - We cannot stand still
 - If you're utility is not trying new things, question it
 - At least, join DEED, APPA's research program



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- **Learn, Learn, Learn**
 - **APPA Conferences**
 - **Bring Policymakers to National Conference**



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Network & Grow Together