

Agenda

- The Big Picture
- The role of BESS in the energy Transition
- California vs Texas
- Energy Storage Technologies
- BESS potential in Oman



Surah Jathiyah Ayat 13

وَسَخَّرَ لَكُم مَّا فِي السَّمٰوٰتِ وَمَا فِي الْاَرْضِ جَمِيعًا
مِّنْهُ اِنَّ فِيْ ذٰلِكَ لَاٰيٰتٍ لِّقَوْمٍ يَّتَفَكَّرُوْنَ

Wa sakhkhara lakum maa fis samaawaati wa maa fil ardi jamee'am minhu; inna feezaalika la Aayaatil liqawminy yatafakkaroon

And He has subjected to you whatever is in the heavens and whatever is on the earth - all from Him. Indeed in that are signs for a people who give thought.

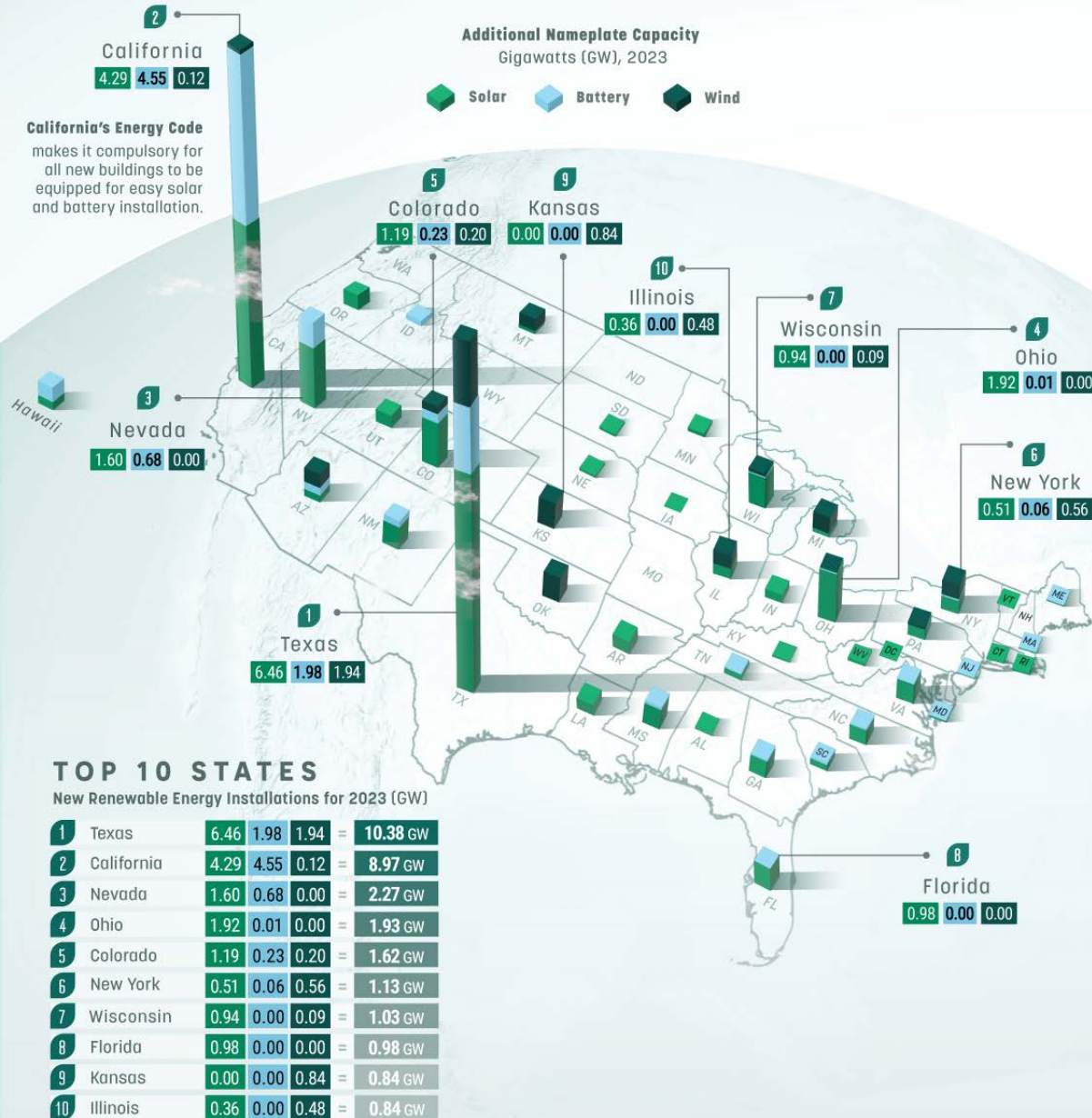


All sources are needed!



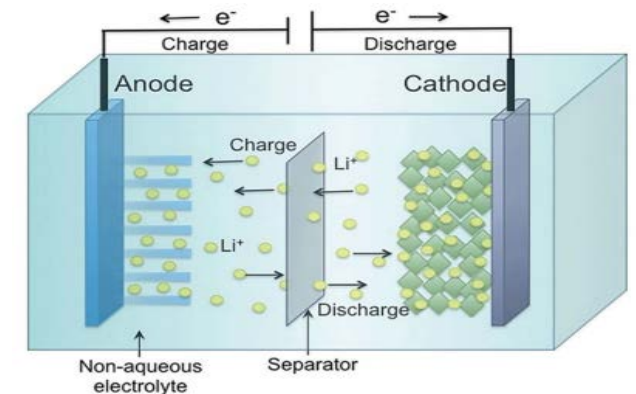
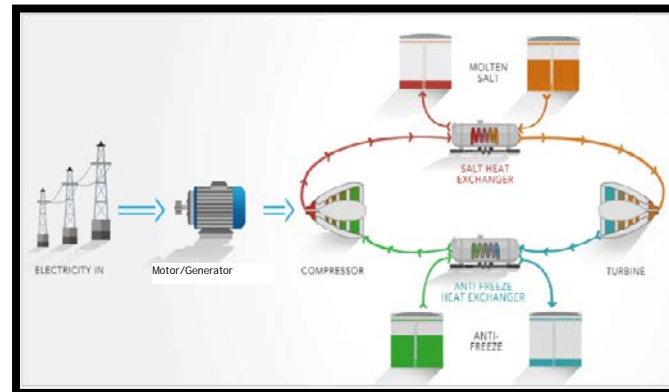
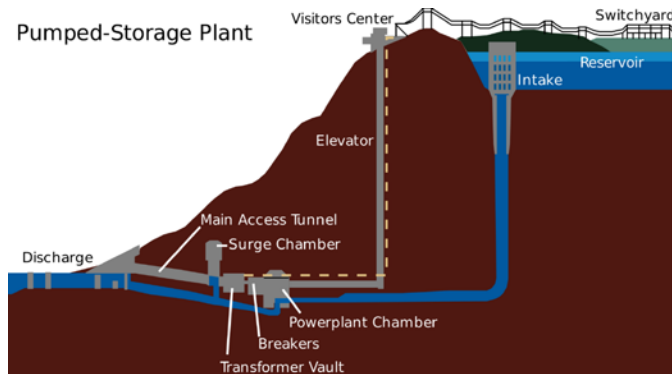
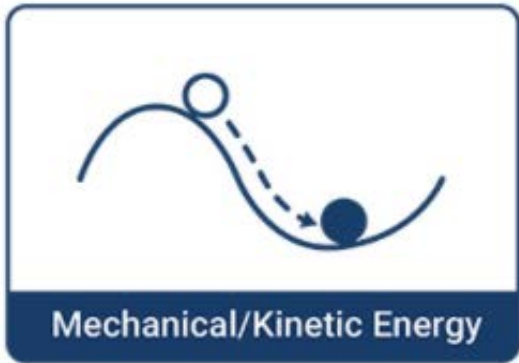
all new power installations in the U.S. being solar.

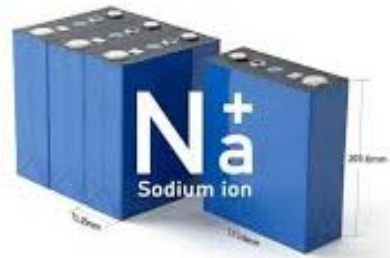
Three states make up over 50% of new renewable energy installations.



California Vs Texas

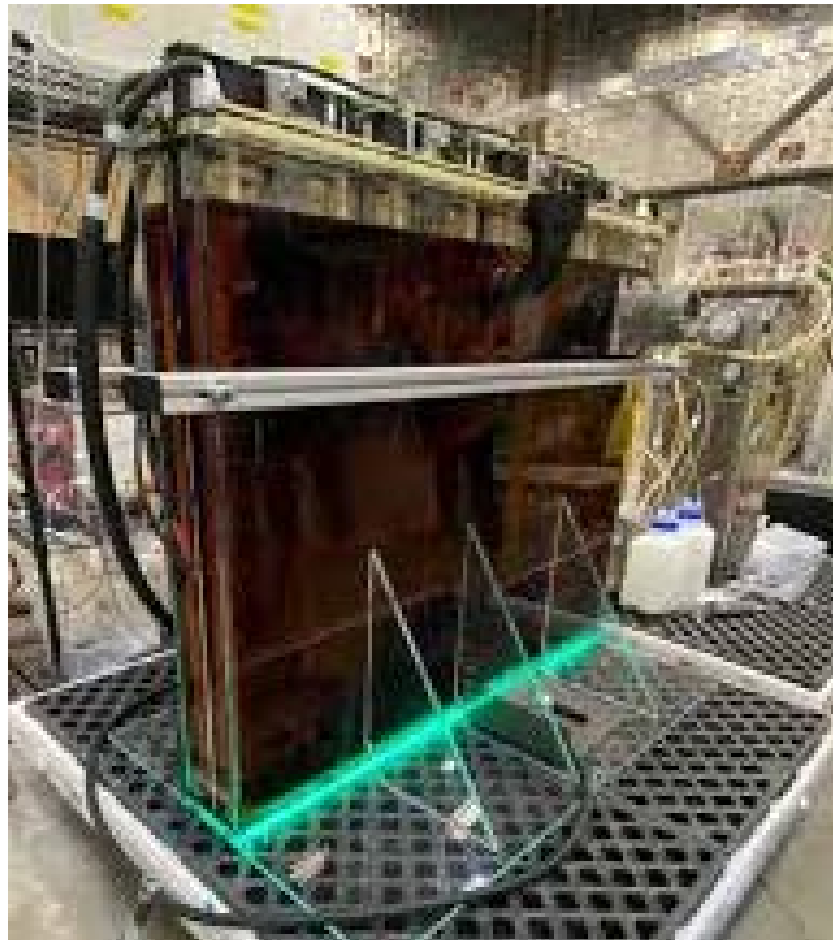
ESS Technologies





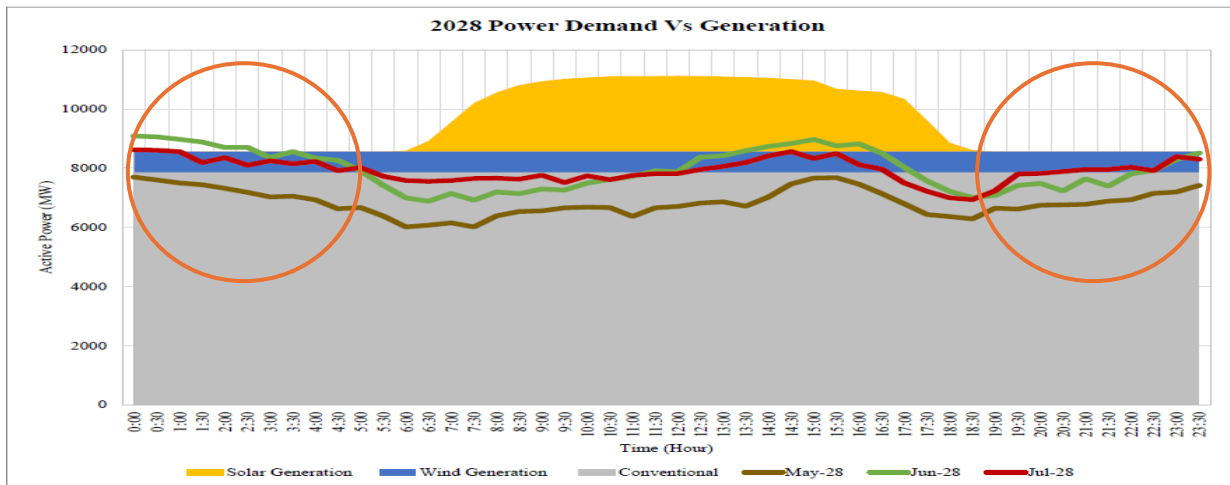
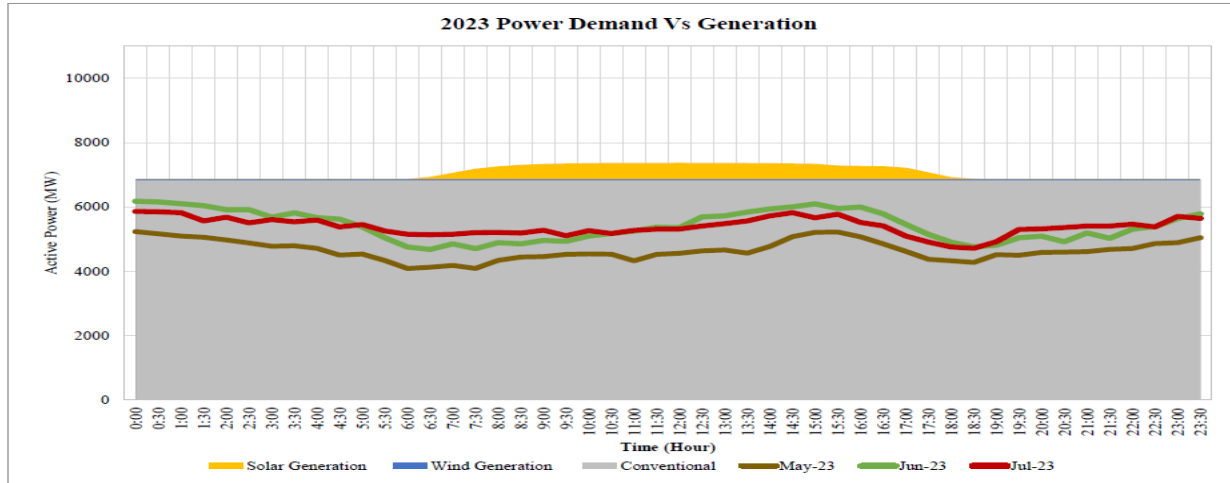
Electrochemical Technologies

- Li-ion
- Sodium-ion
- Solid-State
- Flow (iron, vanadium, zinc, etc.)
- Iron-air
- Nickel hydrogen
- others

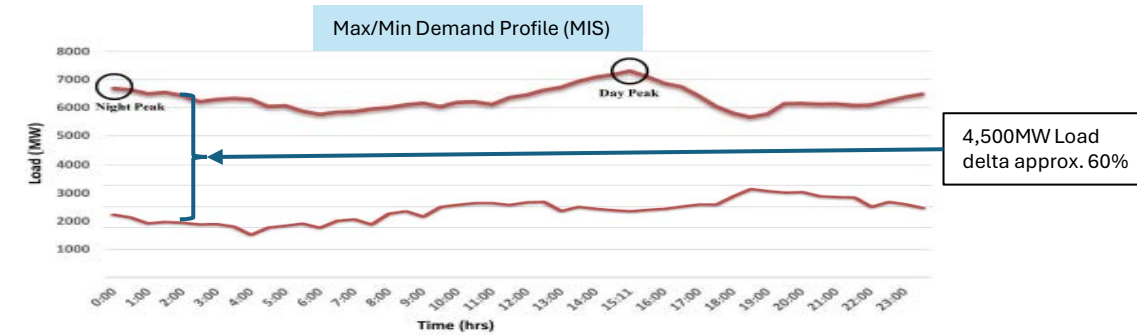


BESS Potential in Oman

- Energy Shifting



- Seasonal Storage



- Ancillary Service

- Typical need with higher renewable penetration
- Regional generation swing
 - Wind concentration in the South
 - Solar concentration in the North
- Load-Generation geographical mismatch

BESS Potential in Oman

- Resiliency:

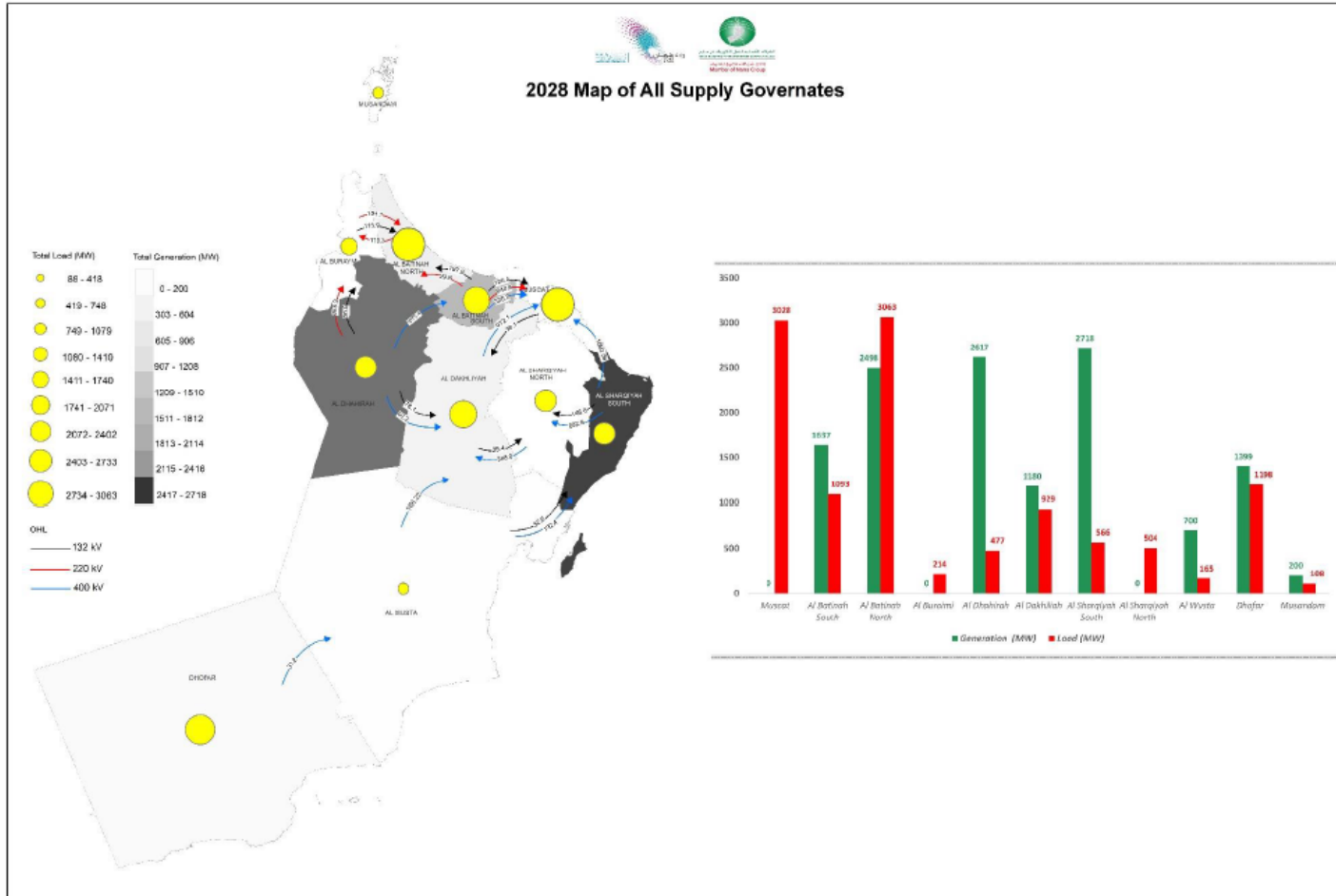


Figure 38: Map of All Supply Governates

- In addition to the load-generation geographical mis-match. The concentration of generation sources to few large CCGT plants is another major resiliency risk.
- Storage can bring the energy closer to the load and provide resiliency to the system by adding buffer points throughout the grid.