

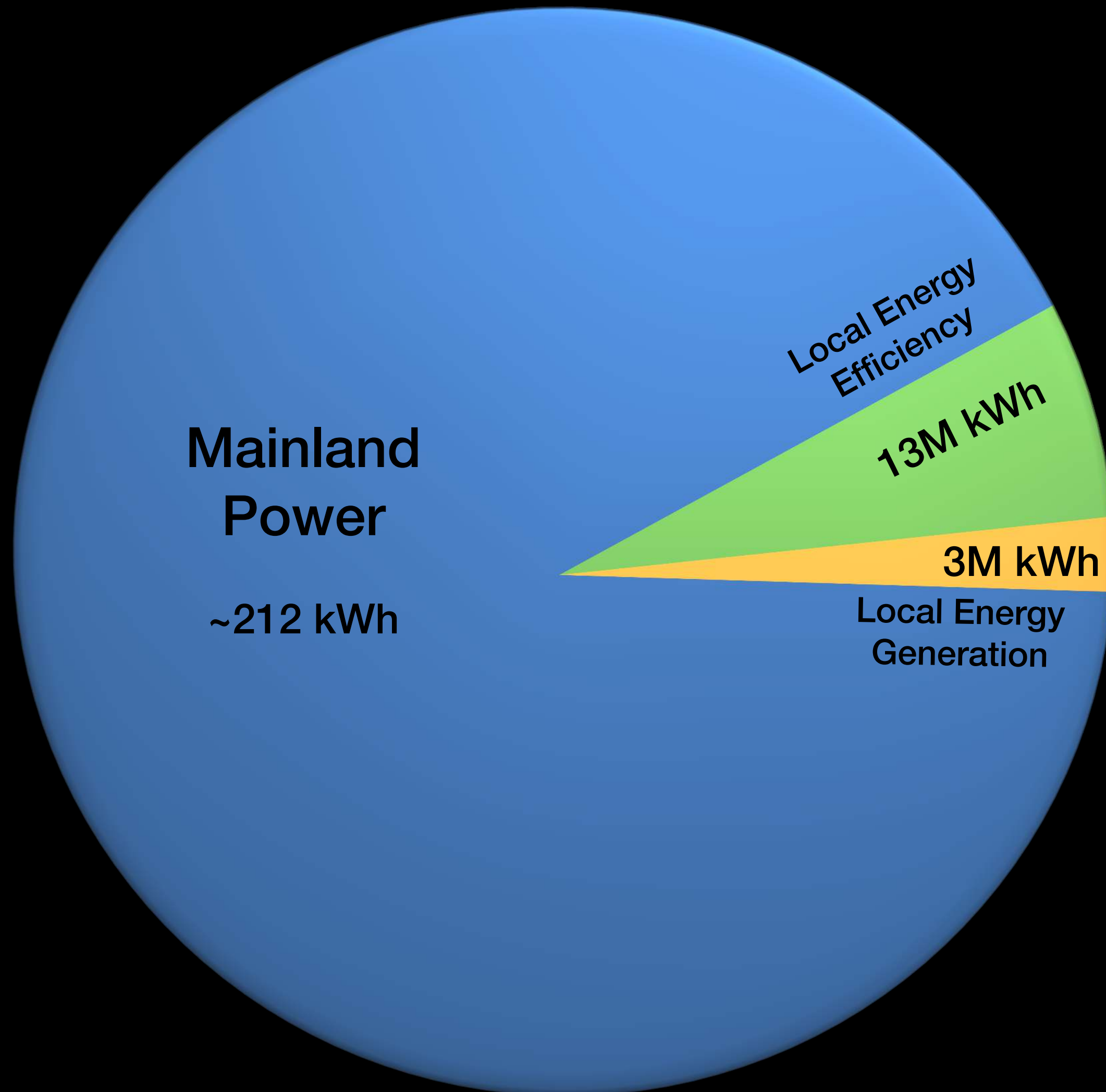
NW HYDRO AND WIND POWER ANALYSIS

OPALCO

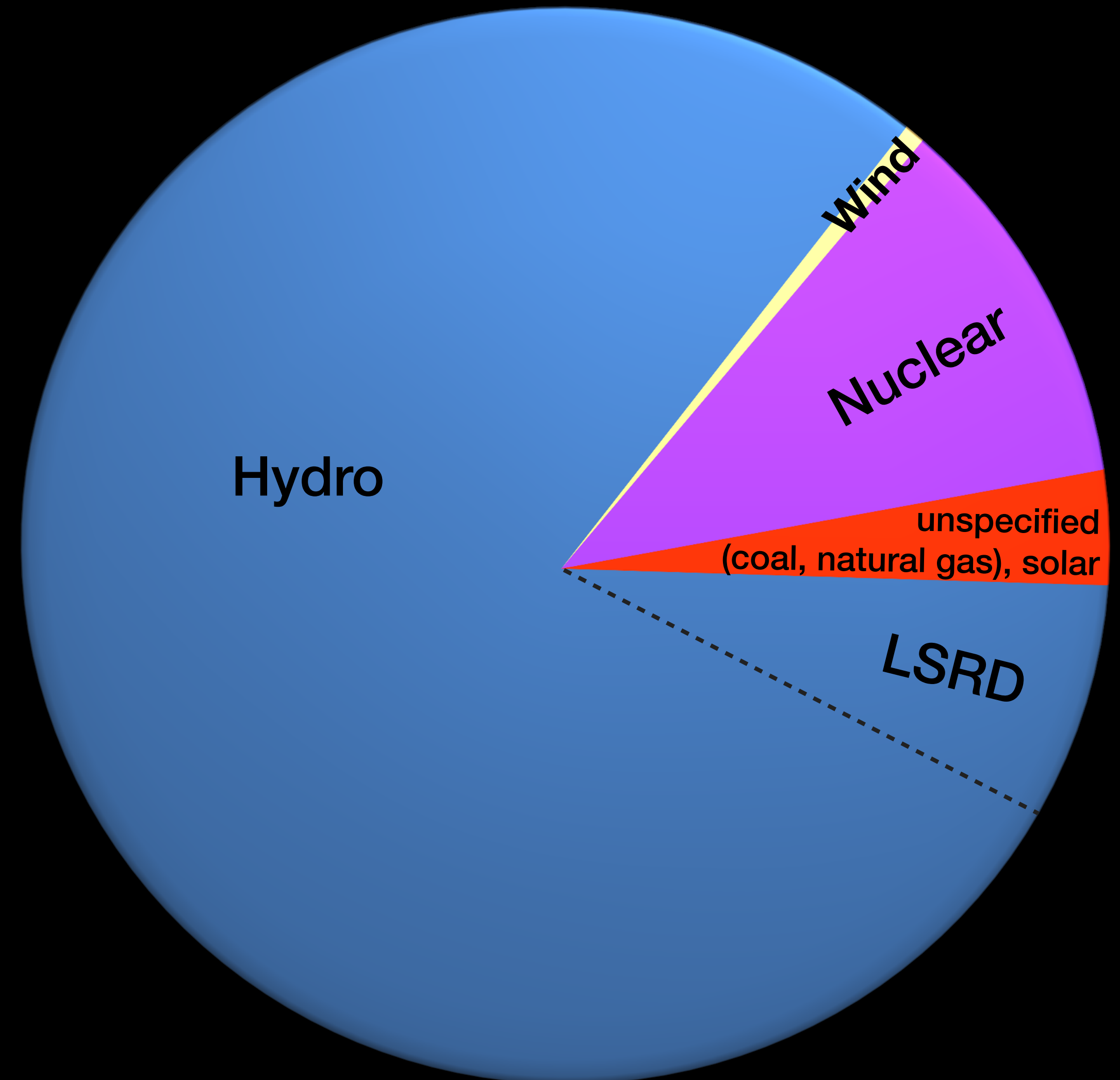
Board Meeting
February 2022

2020 Energy Mix

OPALCO Energy Mix

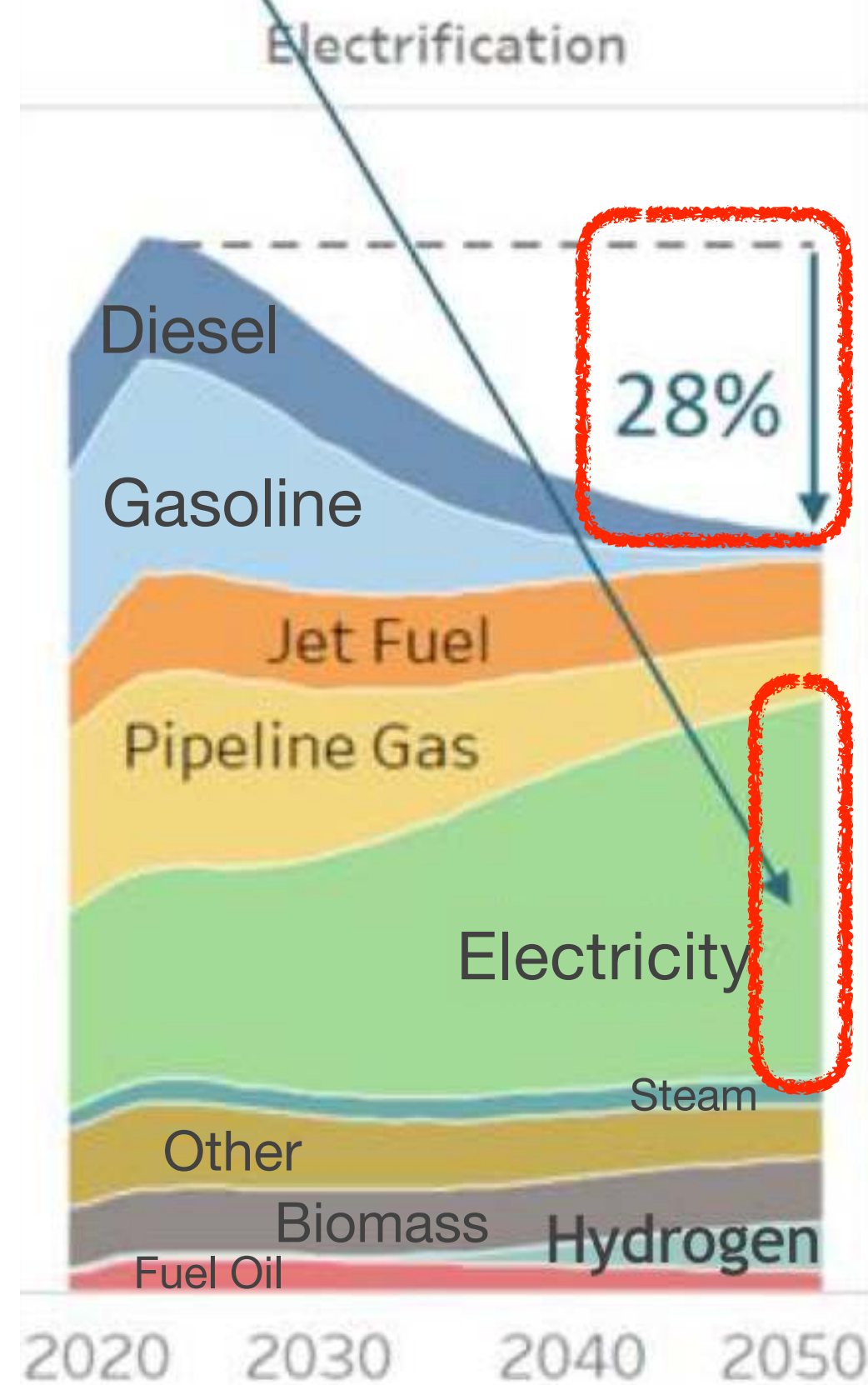


Mainland Power Energy Mix



WA 2021 Energy Strategy: Objectives and Implications

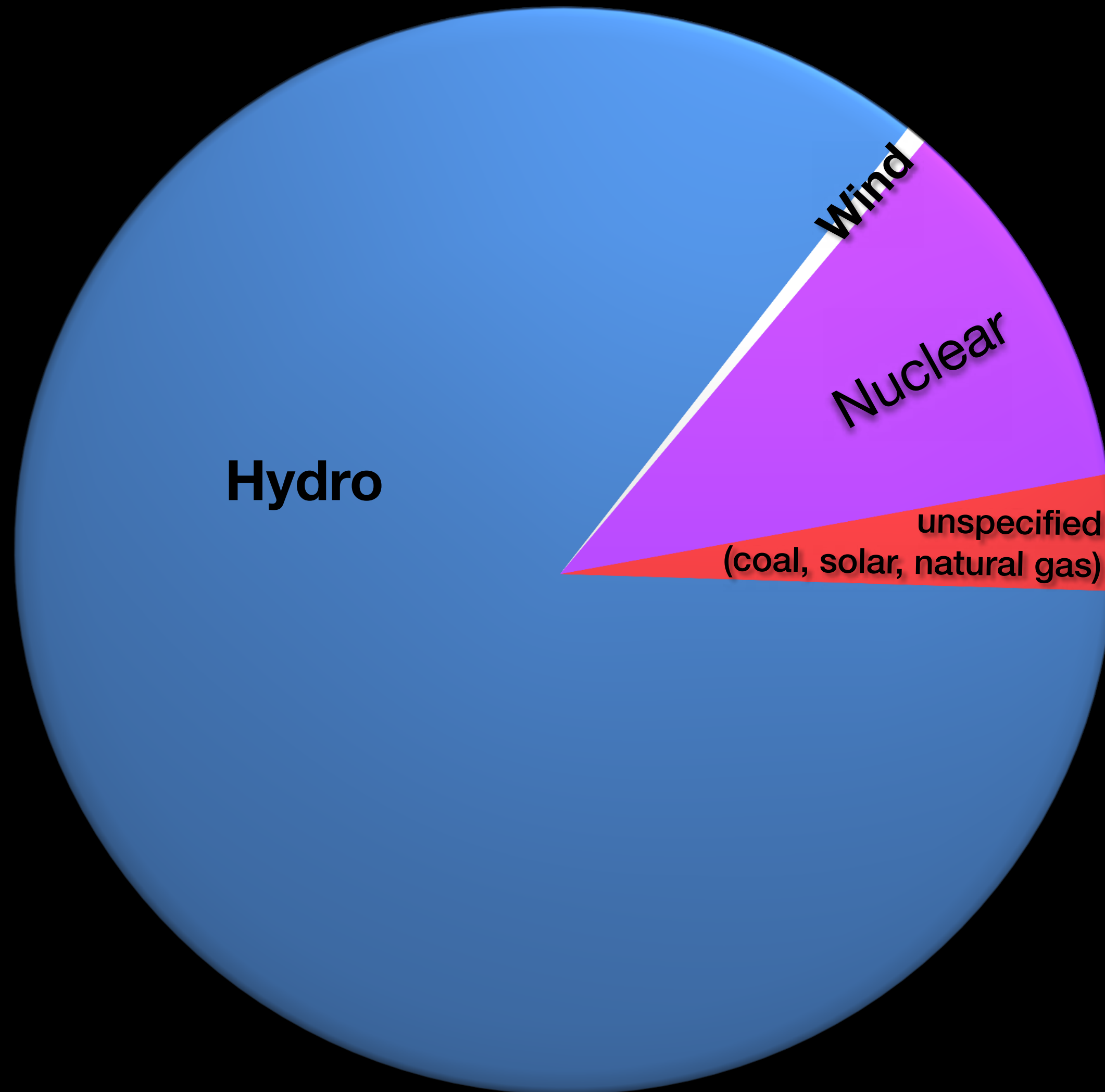
Electrification: **90% growth** in electricity sector over 2020 levels, displacing fuels



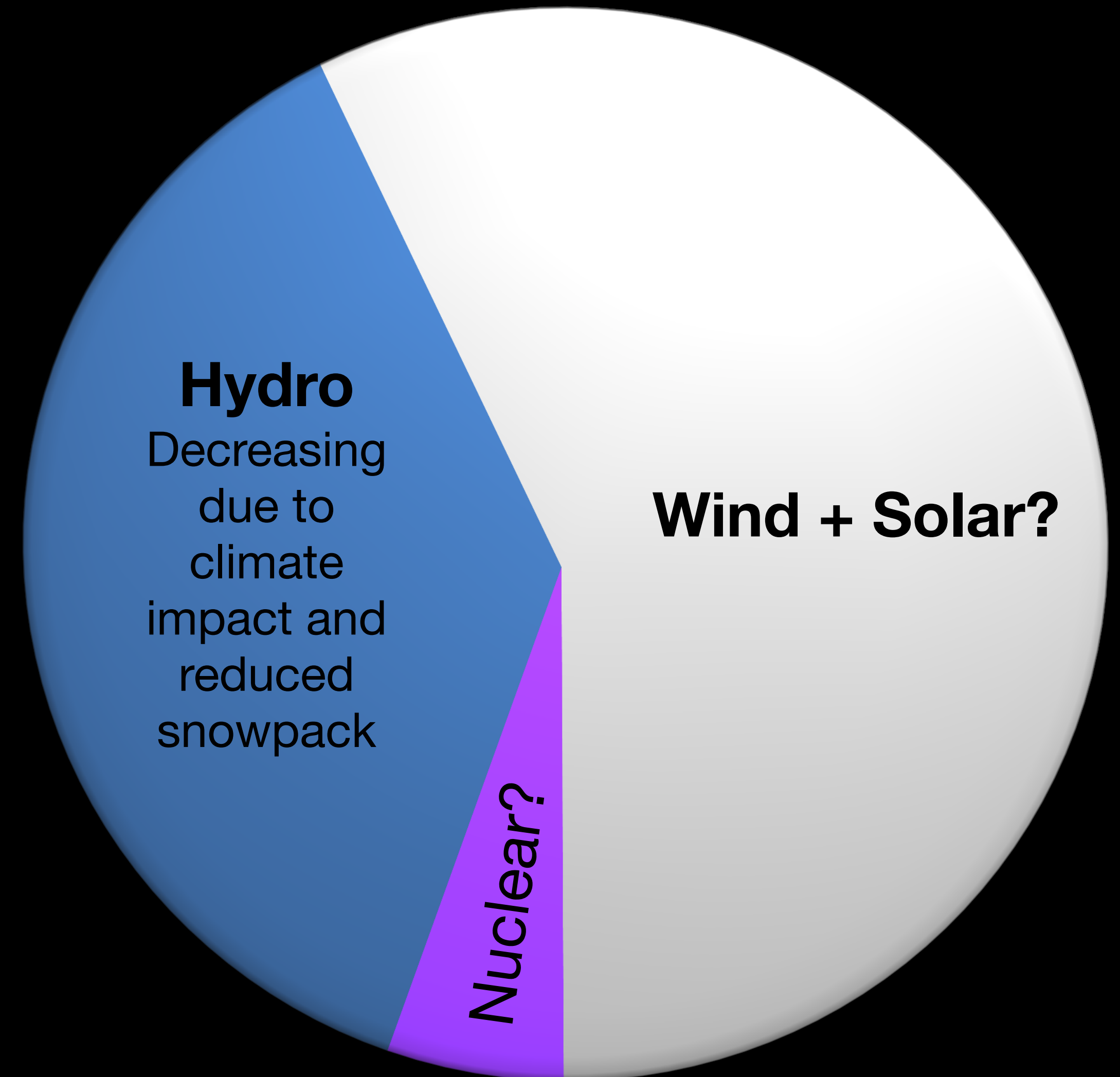
- ❖ Decarbonization is rapidly driving replacing fossil fuels with electricity for **heating and transportation**.
- ❖ **Capacity is decreasing dramatically**- e.g. Coal plant shut down, retirements, carbon reduction legislation, etc..
- ❖ By 2050, electricity demand will nearly double to reduce TOTAL energy demand by 28% (see chart at left).
- ❖ New demand will largely be met by **new solar and wind generation**.
- ❖ **It will require millions of acres of land** to host solar and wind generators and new transmission corridors. **It will take longer than expected to secure that land**.
- ❖ California is spending \$11.7B for new out-of-state, PNW transmission line to tap into the Wind resources that the PNW is relying on **to cover capacity shortfalls**.
- ❖ **If California was a country, it would be the fifth largest economy in the world**. It will pay top dollar for PNW wind resources, while **the negative local impacts are felt by Pacific North Westerners**, thereby exacerbating the vicious cycle of consumer resistance to renewable generating projects and PNW not achieving new renewable generation targets.

Example 2050 Energy Mix

2020 Mainland Power Energy Mix



2050 Mainland Power Energy Mix



Important Terms for Power Capacity

- **Nameplate Capacity**

The maximum energy a resource could produce under ideal conditions.

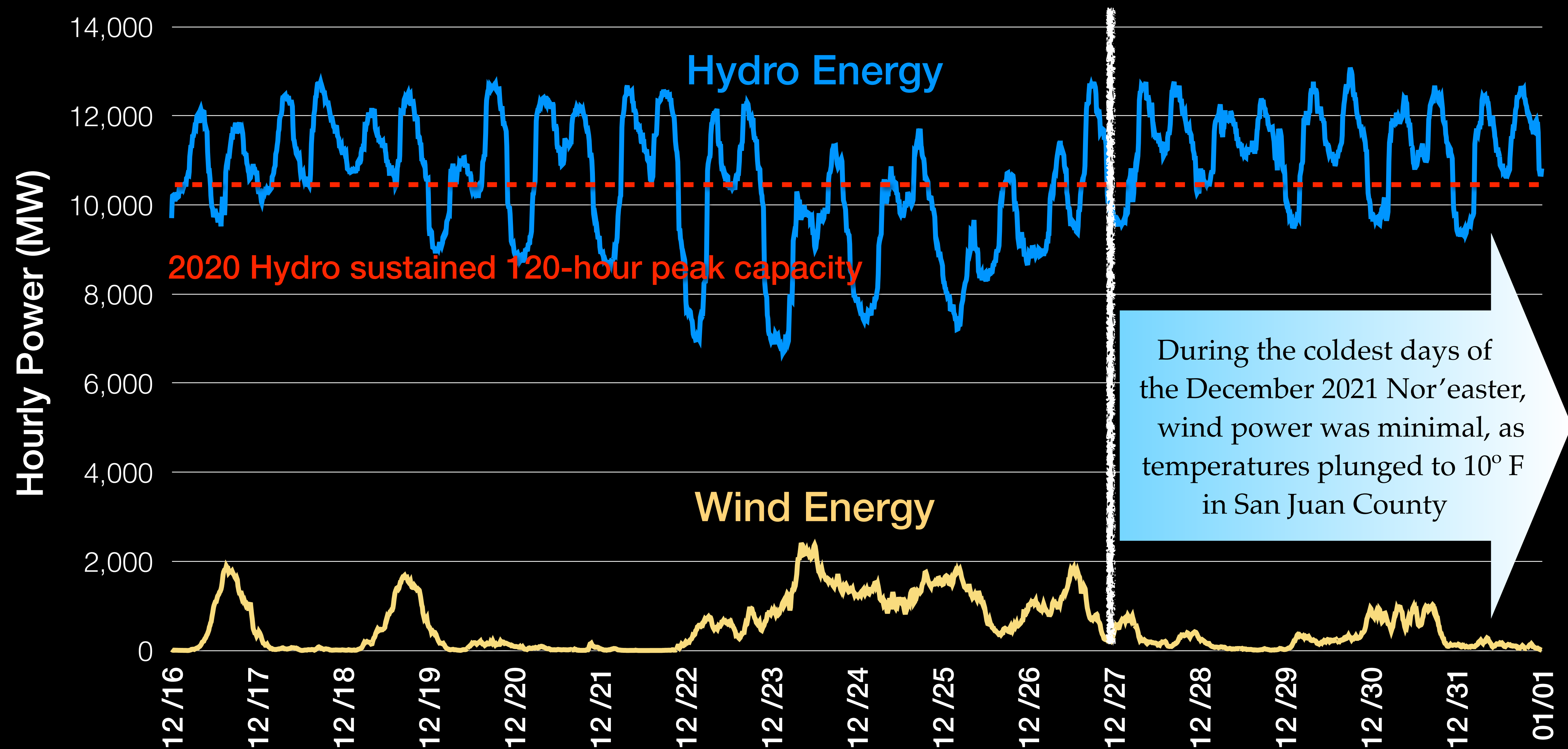
- **Capacity Factor**

The total amount of energy actually produced. For example, solar has a capacity factor of about 30% in the southwest, and only about 15% in the northwest. This is due to nights, winter, and lower intensity of the sun.

- **Effective Load Carrying Capability (ELCC)**

A measure of the probability of getting the energy you need at the time you need it. For example, if the load during a cold snap doubles, but there is not enough NW wind, then it doesn't matter how good the wind turbine's **Nameplate Capacity** or **Capacity Factor** are, it is unable to meet the need for power so alternative resources need to be built to back the wind power up.

During the December cold-snap, the region had minimal wind power, pushing hydro to near peak capacity

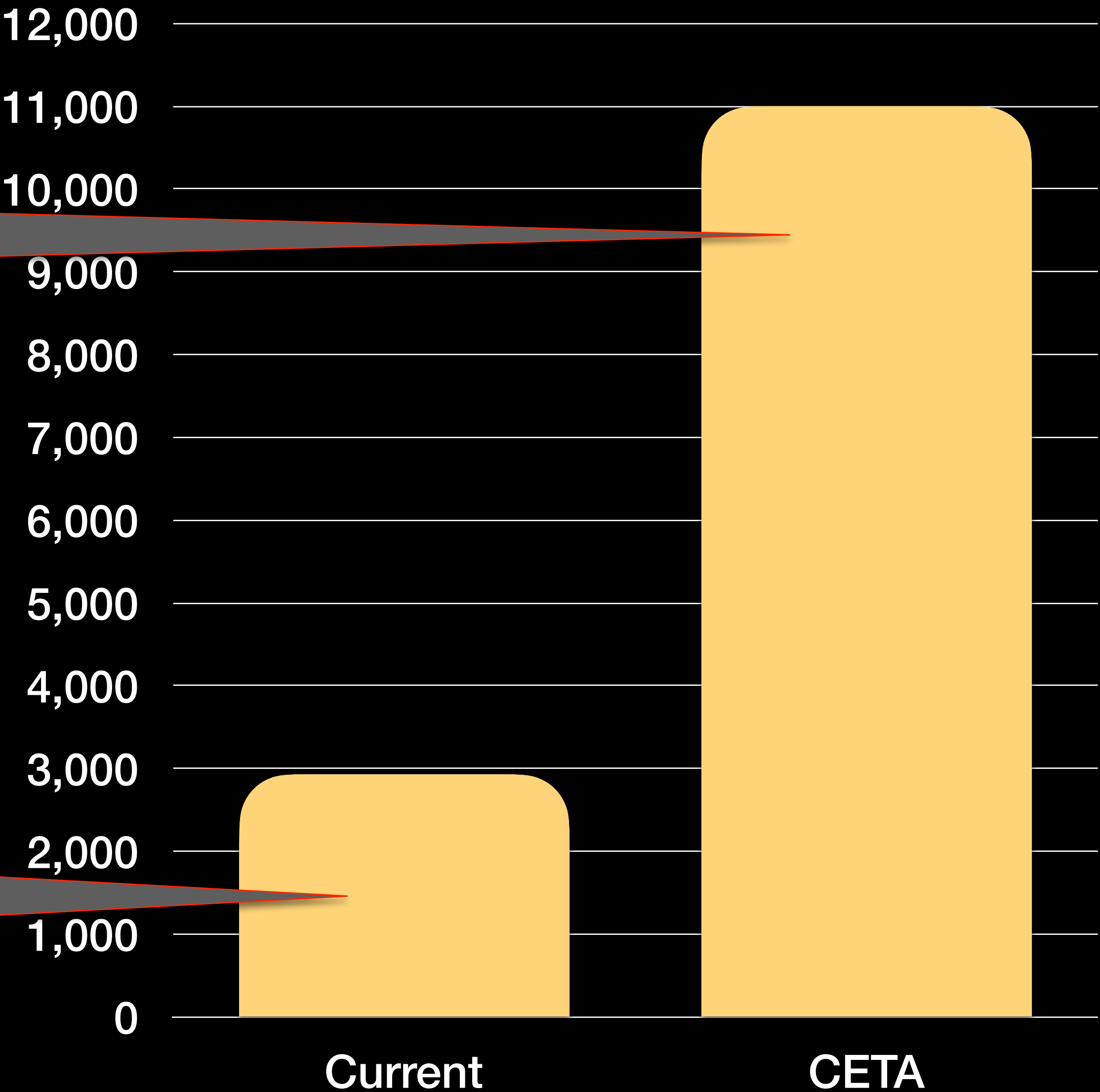


How Long Will it Take to Develop New Wind Power Resources

Wind Power Needed (MW)

To meet CETA mandated ending of coal power, wind power will need to at least **triple** based on monthly average power. Much more will likely be needed, plus massive storage to meet ELCC hourly analysis.

This is the current installed NW wind power capacity. It required over 25 years to develop.



CETA is reducing NW Capacity in the near term, while load doubles by 2050

To replace lost capacity and meet doubling load, while avoiding rolling blackouts:

- What should the new energy come from?
- For especially land intensive energy like solar and wind power, where will it be located?
- How much will it cost?
- How long will it take to develop?

Climate change is not slowing, millions of species are at risk.

- Advocate with our legislators and stakeholders for funding and permitting certainty.
- Advocate for an RTO in the pacific northwest, tasked with ensuring all the questions above are addressed and implemented.

Thank You