

Oregon Energy Policy and the Potential for Ocean Energy

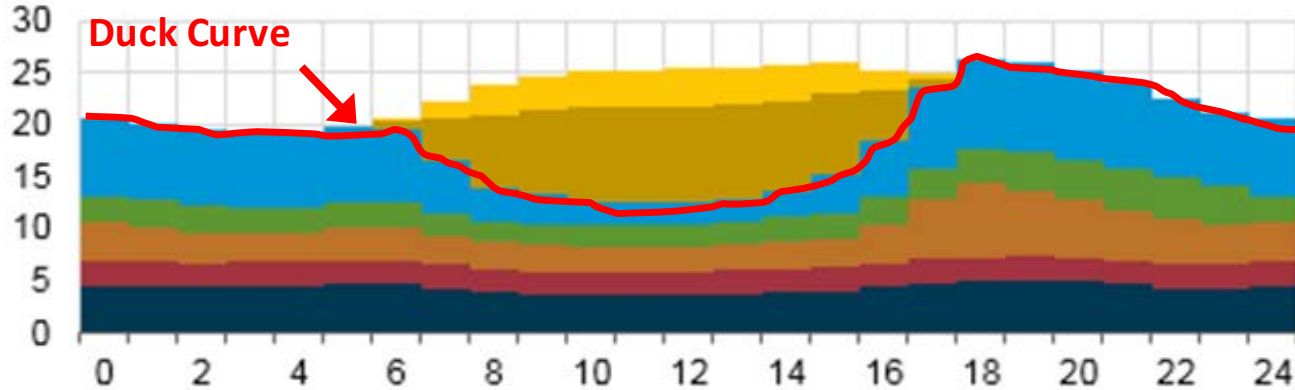
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High-Level: Oregon Energy Policy

- Investor-owned utilities (IOUs) vs. Consumer-owned utilities (COUs)
- 50% RPS by 2040 for IOUs
- ~95%+ of COU demand served by hydroelectric (mostly from BPA)
- Non-binding GHG targets—75% reduction from 1990 levels by 2050
- Local goals: City of Portland commitment to 100% clean energy
- Potential for beneficial electrification to increase electric demand?

California has a diurnal challenge...

California Independent System Operator net generation, March 11, 2017
gigawatthours



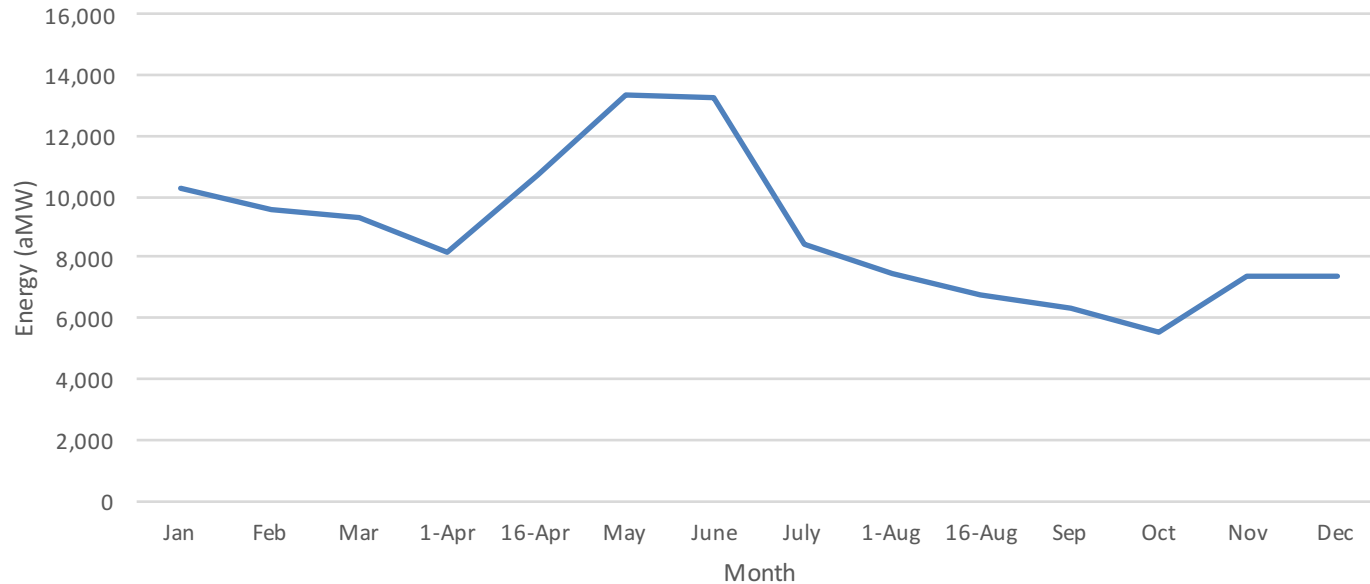
California ISO

distributed solar
utility-scale solar
imports
other renewables

thermal
nuclear
hydroelectric

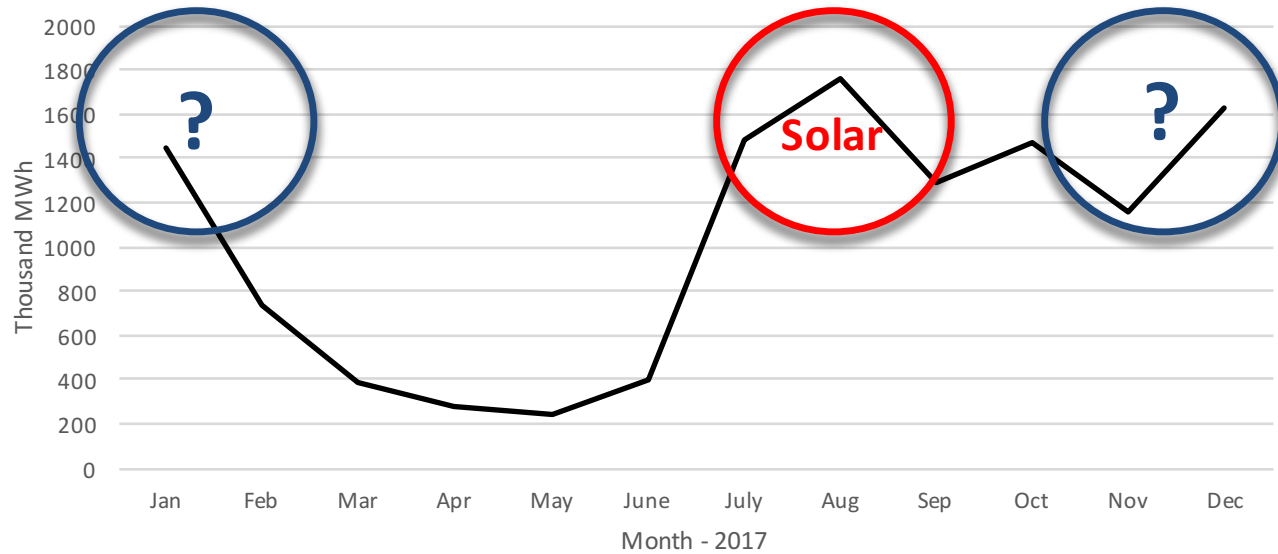
...the Northwest has a seasonal challenge

**Forecasted Monthly Hydro Generation from Federal System
for OY 2019 Under Average Water Conditions**

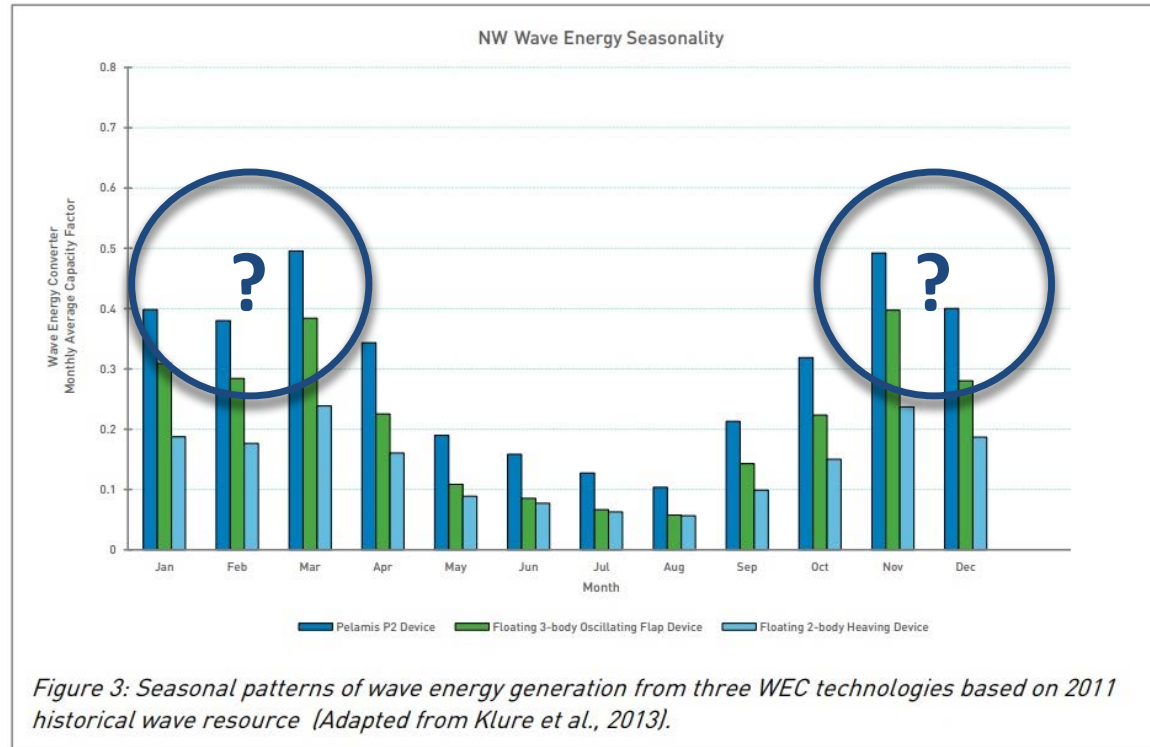


...the Northwest has a seasonal challenge

Utility-Scale Generation from Natural Gas in Oregon by Month
(2017)



Can ocean energy help fill the gap?



Long-term options for Oregon

Deep-decarbonization in winter months: uncertain solutions

- **Battery storage**—large-scale, seasonal duration impractical
- **Renewable gas**—RNG or renewable power-to-gas costs are high
- **Transmission**—inter-regional transmission is costly
- **Ocean energy**—unique *winter-peaking* renewable resources



Thank you!

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References

- **Slide 3:** EIA, Rising solar generation in California coincides with negative wholesale electricity prices, April 7, 2017. Available online: <https://www.eia.gov/todayinenergy/detail.php?id=30692>
- **Slide 4:** BPA 2017 White Book, Table 2-7 Federal System, Available online: <https://www.bpa.gov/p/Generation/White-Book/wb/2017-WBK-Loads-and-Resources-Summary-20171218.pdf>
- **Slide 5:** EIA Electric Power Monthly, Table 1.7.A. Utility Scale Facility Net Generation from Natural Gas, Electric Power Sector, Available online: https://www.eia.gov/electricity/monthly/epm_table_grapher.php?t=epmt_1_07_a
- **Slide 6:** Wave Energy Industry Update: A Northwest US Perspective, August 2015, p. 14. Available online: <http://oregonwave.org/oceanic/wp-content/uploads/2015/10/Northwest-Wave-Energy-Industry-Update-FINAL.pdf>