

## HOW?

Transitions often elicit the question: “How will we do that?”. It’s also applicable to the metamorphosis of Pasadena Water and Power from a coal-burning utility into a 100% clean energy exemplar.

In Pasadena’s case that particular question is not much of a puzzler since there are so many precedents in California. Here are five representative guides on ‘*how to achieve 100% clean energy by 2030*’.

1. Pasadena could follow the lead of Lancaster, California, a city of 171,000 which has *already* achieved 100% carbon-neutral power. Lancaster Energy (LE) is a locally-operated, locally-controlled, community-choice aggregator (power provider) which began operations in 2015. Unlike other CCAs, it is limited in geographical extent to the City of Lancaster. Of particular note, the Lancaster City Council governs Lancaster Energy through the office of the City Manager; there is no separate Board of Directors. Thus Lancaster’s size and LE’s governing structure makes LE an ideal clean-energy analog for PWP. If LE can achieve 100% carbon-neutrality in 6 years, so can PWP. Moreover, PWP has one significant advantage over LE: PWP has ownership of its power lines.

<http://lancasterenergy.com/>

2. Follow the roadmap published by Peninsula Clean Energy (PCE) and achieve 100% clean energy with 99% time-coincidence **by 2025**, with no more than a 2% increase in rates. <https://www.peninsulacleanenergy.com/wp-content/uploads/2023/01/24-7-white-paper-2023.pdf>

3. Emulate the plans of Sacramento Municipal Utility District (SMUD), Sacramento's municipal utility. Visions, designs, and roadmaps for how to achieve 100% clean energy by 2030 are currently under development at SMUD. PWP could collaborate with SMUD on this effort, a bespoke arrangement that would benefit both parties.

<https://www.smud.org/-/media/Documents/Corporate/Environmental-Leadership/ZeroCarbon/2030-Zero-Carbon-Plan-Executive-Summary.ashx>

4. If PWP's expertise in ramping to 100% clean energy is limited, Pasadena can still achieve that goal in 2030 by hiring an outside Electric Services Provider. These firms are turn-key operations who can quickly bring-about the necessary portfolio transition, when given guidance. The provider must self-finance and sign an at-risk, performance-based contract (so as to minimize the risk to PWP). ESP companies approved to operate in California by CPUC are listed here:

<https://cleanpowerexchange.org/resources/support-organizations/>

5. Internal steps PWP can take to advance a 100% clean energy agenda. Some of the steps below have been proposed by PWP. (The description is a little detailed.)

A. Increase Distributed Energy Resources (aka rooftop solar + batteries) *threefold*

- i. State-of-the-art power modeling shows that DER equal to about 10-15% of peak load is optimal for grid operations [vce]
  1. cost-effective because local DER eliminates need to build additional, renewable peaker-plants in desert
- ii. Feed-in Tariffs are effective for growing DER

1. two methods:
    - a. net-metering
    - b. power-purchase agreements
  2. one example: <https://redwoodenergy.org/fit/>
  3. to satisfy Resource Adequacy requirements, PWP needs about 60 MW of local, rooftop, dispatchable DER (roughly equivalent to the capacity of Glenarm Station's Combined Cycle turbine)
- iii. PWP can facilitate local, rooftop, dispatchable DER [pdmp]
1. ignore CPUC's 5% limit on rooftop solar
  2. install smart inverters at each rooftop solar facility
  3. install 'in-front-of-meter' battery electric storage at (or near) each rooftop solar facility
    - a. at least 200 MWh (about 3-hours of turbine operation at Glenarm)
  4. remunerate rooftop solar providers commensurate with achieving the 2030 clean energy objective

B. Acquire (additional) clean energy resources from outside City limits

- iv. negotiate Power Purchase Agreements
- v. upgrade Goodrich Connector to increase import capacity to 336 MW (from current 280 MW limit) [pdmp1]
  1. will retire risk associated with PWP's inability to accommodate increased electric loads

- vi. upgrade Glenarm Station with phase-shift transformer so PWP can import up to 40 MW from LADWP [pdmp1]
    - 1. offers greater flexibility and reliability
    - 2. boosts PWP's power delivery
    - 3. facilitates LADWP's integration into CAISO
      - a. may offer a revenue source for PWP
  - vii. no use of Category 3 unbundled Renewable Energy Certificates
- C. Terminate ownership position in Magnolia Power Plant as soon as possible
- viii. unlikely before 2036 due to debt obligations
- D. Cease all gas operations at Glenarm Power Plant
- ix. gas shutoff unlikely before 2035 due to debt obligations - but minimize turbine operations
  - x. supplement facility with battery electric storage
    - 1. 250 MWh already identified (about 4-hours of turbine operation) [irp21]
    - 2. additional storage as needed
  - xi. implement Demand Response programs equivalent to at least 5 MW savings by 2030 [irp21]
- E. Pay for transition by pursuing all credits and direct-pay options available to PWP through the Inflation Reduction Act.

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## References

VCE Analysis by *Vibrant Energy* considers the power distribution system as a multi-parametric system to be optimized (everything between the energy source and its point of use), rather than the legacy method of treating the grid as a single, undifferentiated “load”. Optimizing for local solar on a 100% clean grid can reduce California ratepayers bills by \$4 billion dollars per year, vis-a-vis utility-scale only. Technical paper: [https://www.vibrantcleanenergy.com/wp-content/uploads/2020/12/WhyDERs\\_TR\\_Final.pdf](https://www.vibrantcleanenergy.com/wp-content/uploads/2020/12/WhyDERs_TR_Final.pdf)  
Explanatory webinar: <https://www.youtube.com/watch?v=8LugAsV--hc&t=27s>

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