

2025 RENEWABLE ENERGY COMMUNITY MEETINGS

Background Information and Frequently Asked Questions

OPALCO

September 2025

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- 90 years of OPALCO leadership on critical county challenges
- NW Environmental Priority
- NW Supply/Demand shortfall
- Utilities required by law to meet customer load growth
- Local energy land use analysis and solutions
- OPALCO leadership highlights

Frequently Asked Questions

- OPALCO Mission
- Local Renewable Energy
- Climate Action
- Essential Public Facilities

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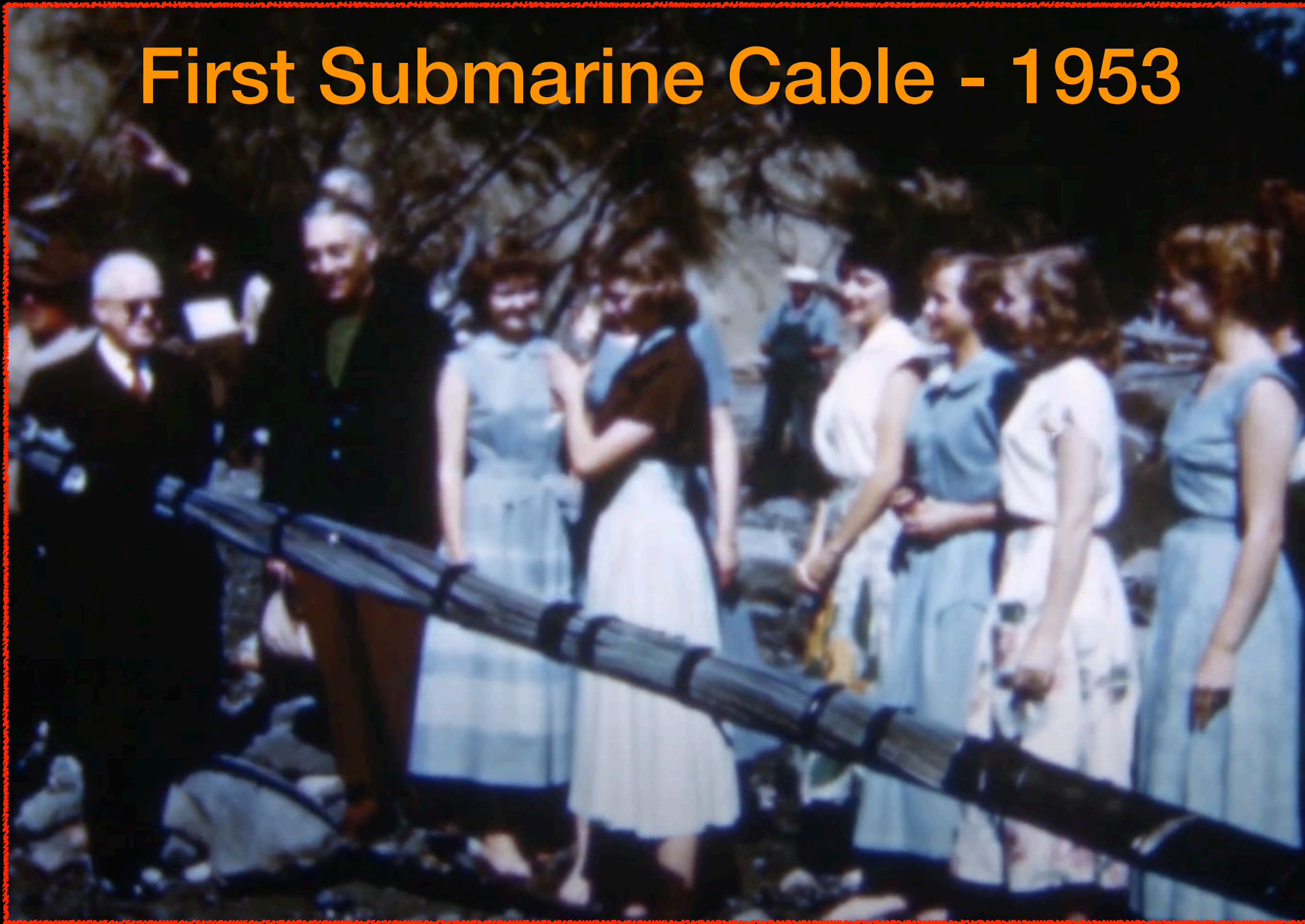
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90-year History of County + OPALCO Innovating and Collaborating

First Submarine Cable - 1953



County and OPALCO collaborate
Joint Use Wireless Ordinance and
First Responder Communications
to speed broadband deployment
and improve public safety

Governor Recognizes OPALCO's
Broadband Crisis leadership and
Solar Micro Grid innovations



First Community Microgrid - 2018



Joint Use
Wireless
Ordinance



Burning Fossil Fuels



ocean acidification, climate heating, hotter streams and rivers, species extinction

extreme weather, flooding, drought, wildfire

\$Trillion+ annually in global healthcare and millions of deaths per year

increased insurance cost, cancelled home insurance for fire and flooding

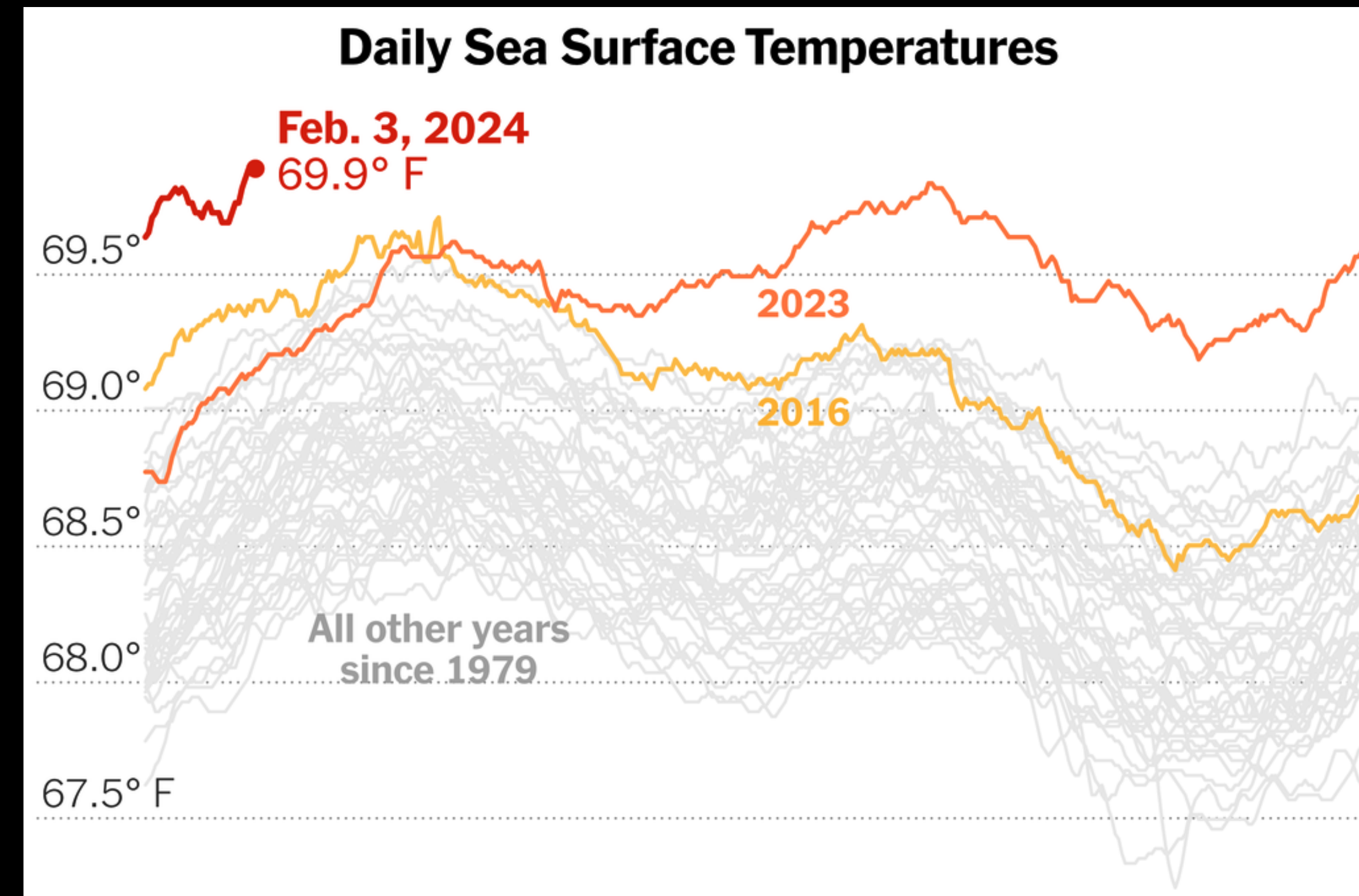
exponentially increasing cost of repair, vulnerable community impact, climate migration

\$2,200 per person yearly explicit/implicit subsidy paid to oil companies

Where is the heat from global warming going?



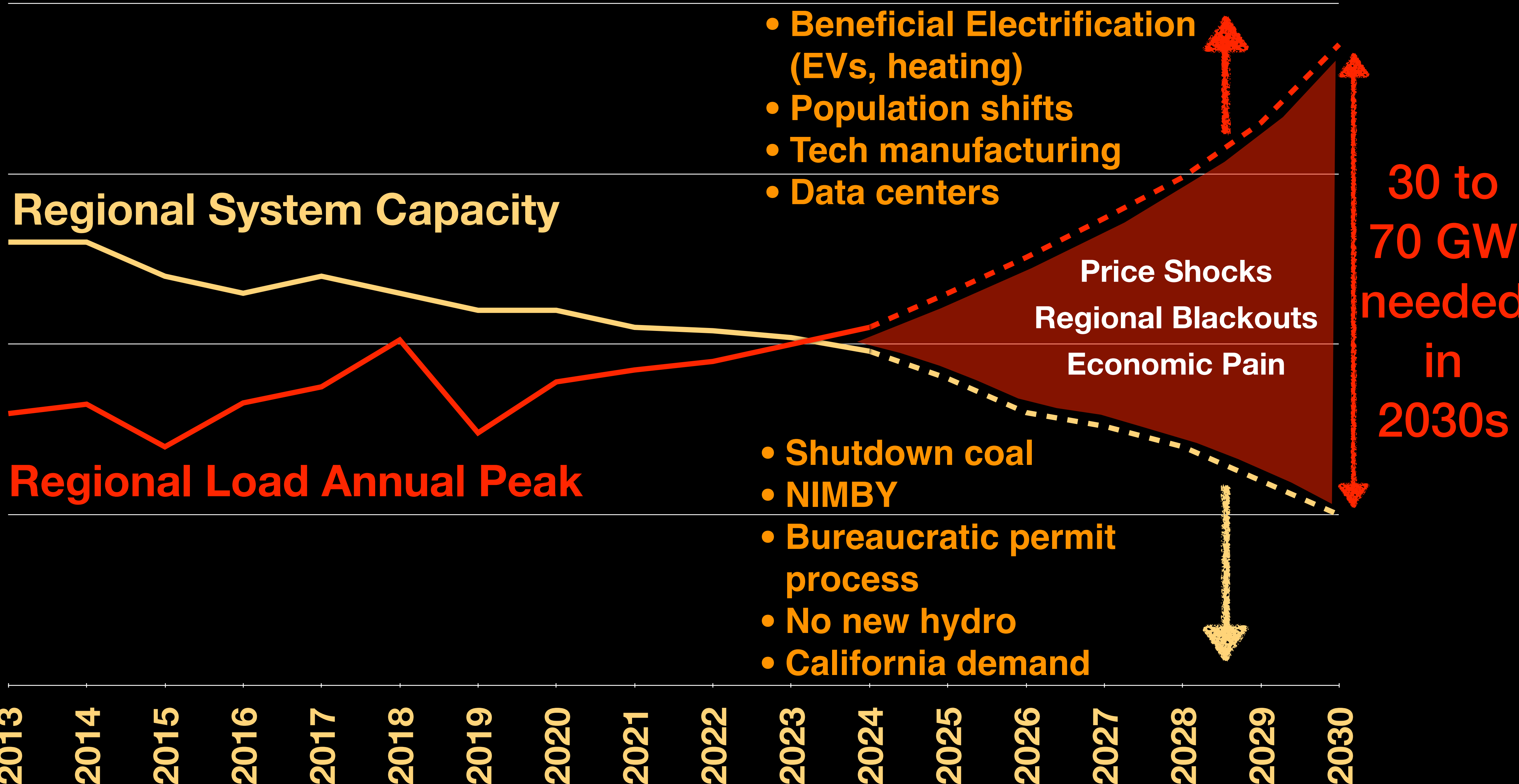
Oceans
Melting Ice
Continents
Atmosphere



NW Energy Demand is Rapidly Exceeding Supply

Washington Clean Energy Transformation Act (CETA): Reduce GHG emissions 50% by 2030

Higher



Lower

OPALCO Must Ensure Reliable Delivery of Power to all Members

During the January 2024 cold snap, the Washington power system almost collapsed.

Between now and 2035, each year we are more at risk.

Picture the loss of life and economic impact that took place in the 2021 Texas blackout

Utility Duty and Mandate

- Duty to serve - RCW 80.28.110, WAC 480-100-620
 - Duty to provide energy to utility members to meet demand
 - Ensure availability of electricity during peak demand periods and emergencies
 - Duty to replace burning fossil fuels with renewable energy
- Washington law: I-937, CETA, and CCA

Growth Management Act (GMA) identifies essential public facilities (EPFs) as facilities that are typically difficult to site but are crucial for public health, safety, and welfare.

OPALCO Must Ensure Reliable Delivery of Power to all Members

Duty to Advise

- Mainland electric load is exceeding supply
Shortfall starts this year, growing to over 30+ GW deficit by 2035
- Outages and price shocks are imminent
2024 January cold snap - grid almost collapsed, 800%+ wholesale price spike
- There is no new hydro
- New mainland renewables projects will take decades to deploy
Northwest needs to be adding 2,500 MW per year – 25X faster than normal

Deficit mainly due to legal and permitting barriers that have historically slowed development to 125 MW per year

County Council January 21, 2025 Meeting

regarding climate action to ensure adequate energy and water

- **Jane Fuller**

“We are not accounting for what water and energy capacity we need to meet growth... in the ongoing Comp Plan update.”

- **Justin Paulsen**

“We are mandated to plan for the numbers given to us by the state... There isn’t a discussion about how we get there... It will require additional staff resources.”

- **Kari McVeigh**

“Do we have enough water? Do we have enough energy to meet our population? We need to be engaging meaningfully in these conversations.”

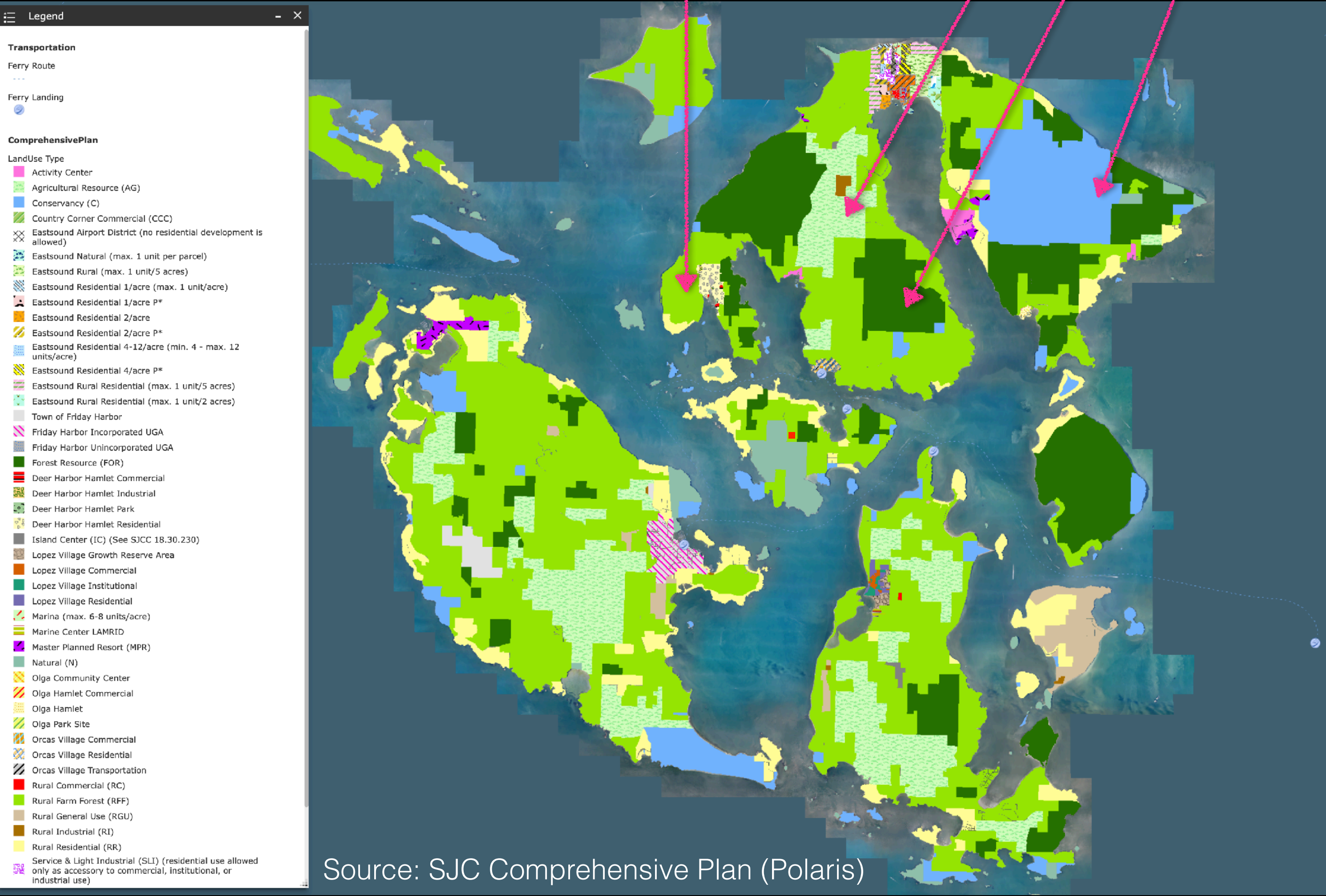
- **Sen. Liz Lovelett**

“We can’t plan for growth without understanding water capacity and thinking about the resiliency of your infrastructure... We are working diligently to reduce GHG emissions. ”

Why did OPALCO choose Bailer Hill Site? Not allowed in 65% of county's 111,000 acres!

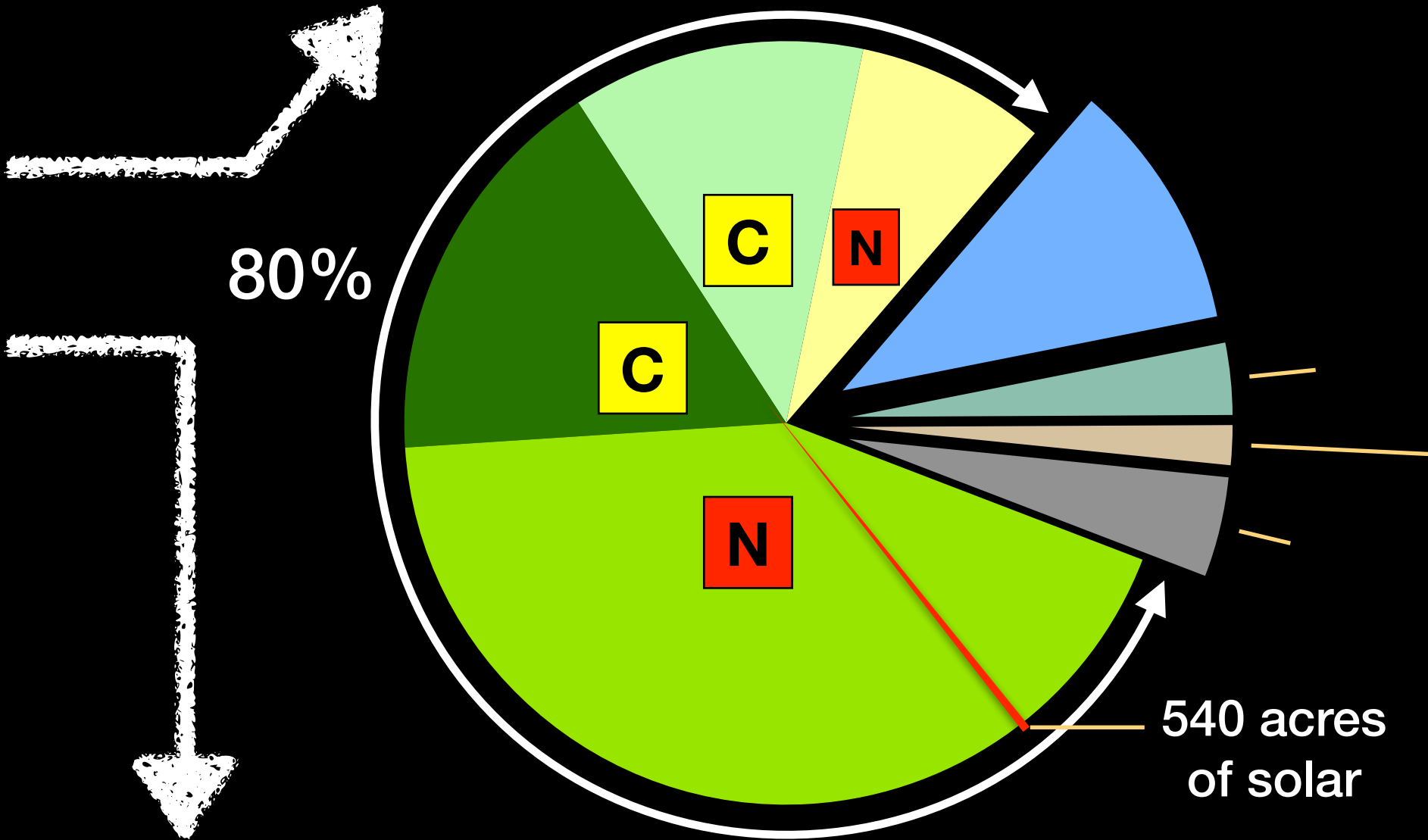
Commercial Power-generation Facilities SJC Land Use Designations

	RURAL					RESOURCE		SPECIAL	
	RGU	RR	RFF	RI	RC	AG	FOR	C	N
	Rural General Use	Rural Residential	Rural Farm-Forest	Rural Industrial	Rural Commercial	Agricultural	Forest	Conservancy	Natural
Current Designations	C	N	N	C	C	C	C	N	N



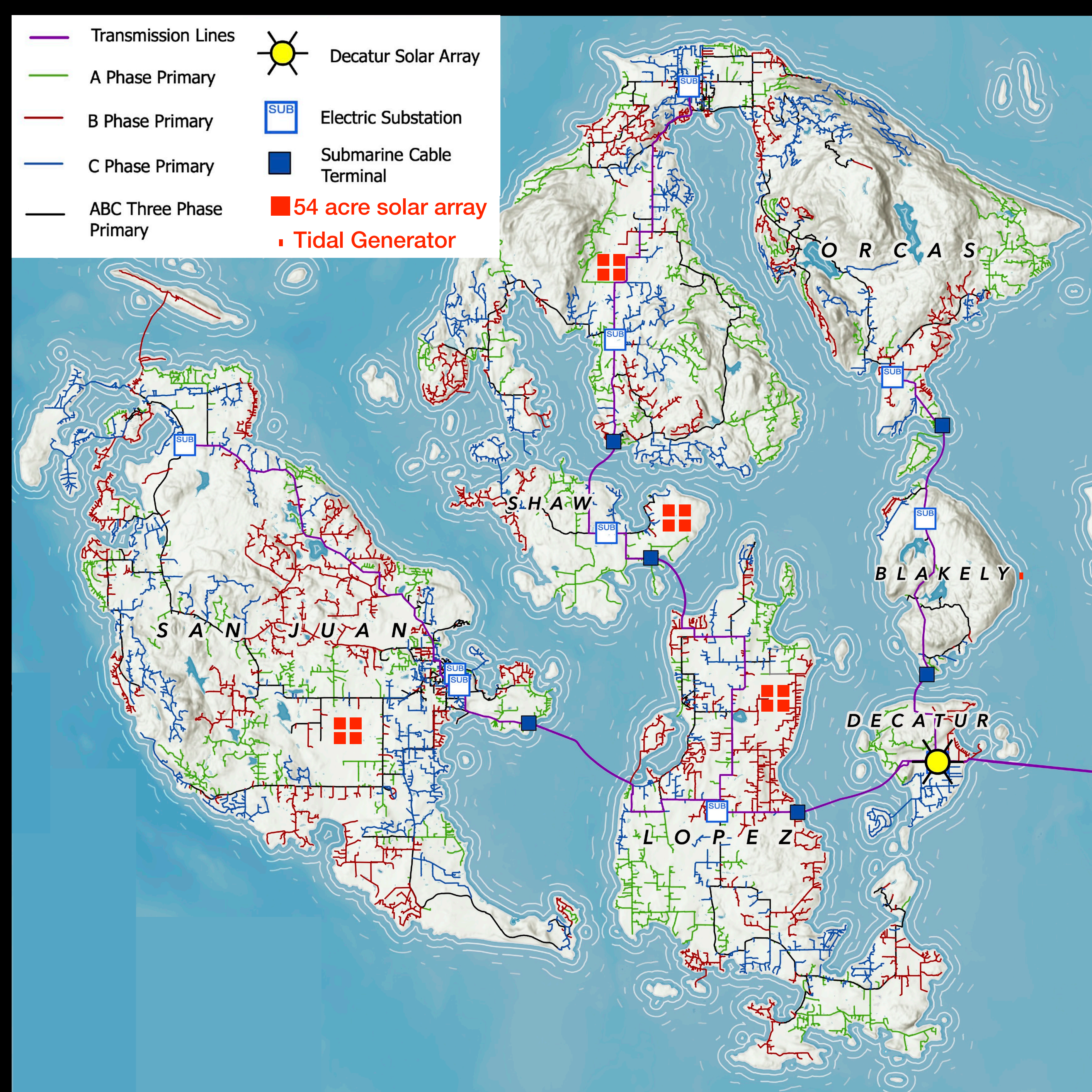
Source: SJC Comprehensive Plan (Polaris)

Land Distribution (111,000 acres)



Y	Use allowed outright, without project permit
P	Provisional use, subject to administrative consistency review for compliance
C	Conditional use, subject to public notice and permit hearing procedure
N	Prohibited use

Of the county's 111,000 acres, we only need 870 acres (0.5%) to produce 35% of our energy use.



875 acres needed

~0.8% of county land

Powers the county through three seasons + critical services in winter

Notes

- No new hydro. Snowpack receding reduces existing hydro
- Submarine cables near peak capacity
- All new load, could be met with just four 55-acre tracking agrisolar arrays per ferry-served island.
- Red squares are drawn to scale.
- Emission reduction equivalent to:
 - Planting 3.9M trees/yr for 10 years
 - Removing 52M lbs CO₂/yr coal generation
 - Not burning 26M gallons of gasoline/yr

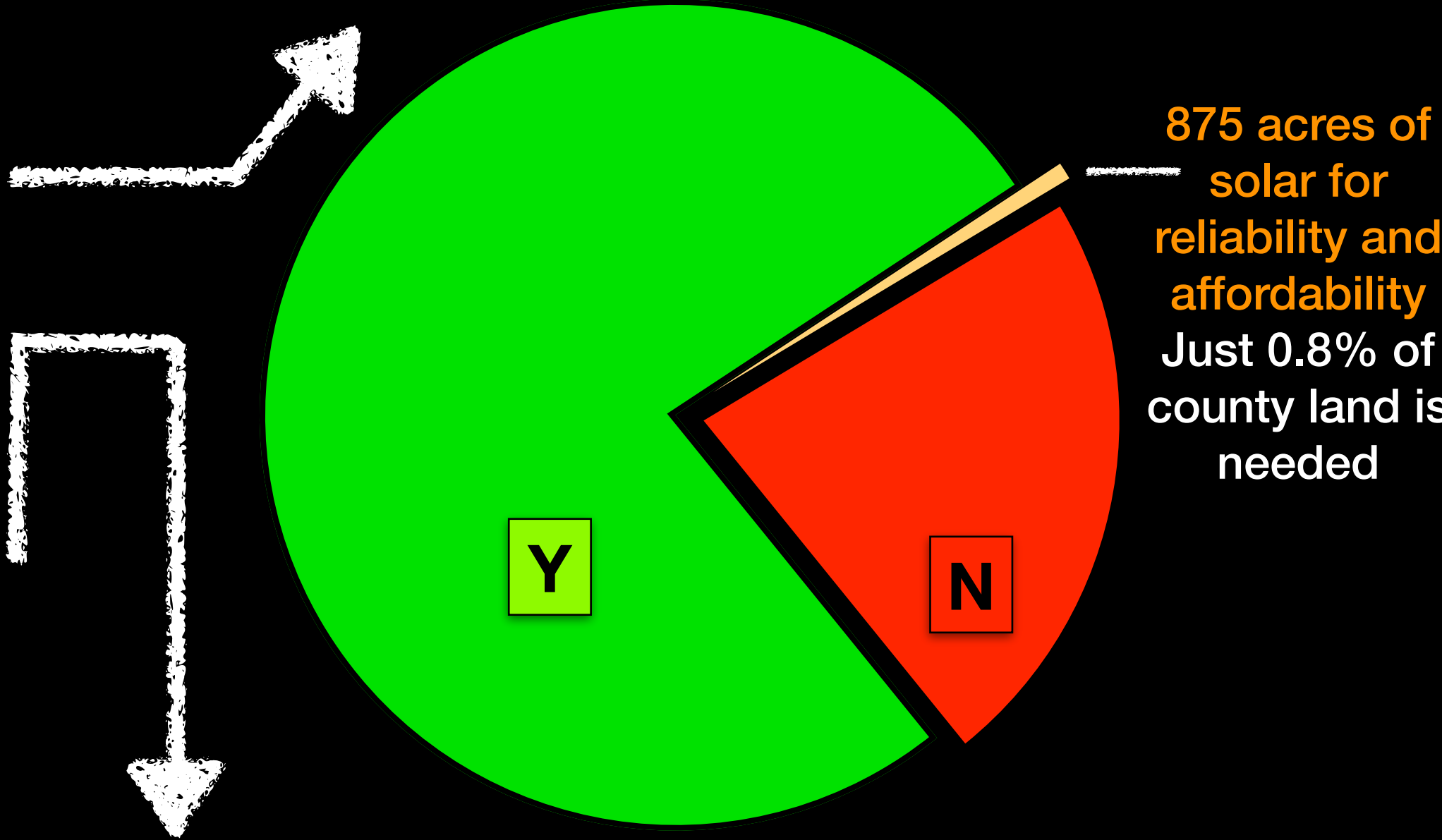
Meeting the Climate Action Imperative with Streamlined Permitting for Utility Renewables

Commercial Power-generation Facilities SJC Land Use Designations

	RURAL					RESOURCE		SPECIAL	
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	Rural General Use	Rural Residential	Rural Farm-Forest	Rural Industrial	Rural Commercial	Agricultural	Forest	Conservancy	Natural
Current Designations	C	N	N	C	C	C	C	N	N
Eco-sensitive Land	N	N	N	N	N	N	N	N	N
Buildable Land	Y	Y	Y	Y	Y	Y	Y	N	N

Eco-sensitive = Conservancy, Natural, Land Bank, Preservation Trust, wetlands, federal, state, county, etc.

Land Distribution (111,360 acres)



If the land could have buildings on it, then it could have renewable generation essential public facilities

*New Jersey has an enlightened, streamlined climate action land use policy, allowing up to 5% of county agricultural land for agrisolar.
In San Juan County, 875 acres = 4.7% of ag land.*

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OPALCO: Community Leadership in Local Energy and Climate Action

	OPALCO	Gasoline	Propane
Energy Business	Nonprofit	For Profit	For Profit
Investment in Community	✓	✗	✗
Energy Efficiency and Conservation Programs	✓ \$20+ million	✗ \$0	✗ \$0
Low-income Programs	✓ \$1.8+ million	✗ \$0	✗ \$0
Investing in Local Energy	✓	✗	✗
Investing in Climate Action	✓	✗ in denial	✗ in denial
Mitigating Wildfire Risk	✓	✗ making it worse	✗ making it worse

Energy and Climate: What problems are we trying to solve?

Business as Usual = Climate Disaster. Time is of the essence. Climate change is progressing faster than the pace of bureaucracy. Streamlined permitting helps increase local renewable energy, reduce fossil fuel burning, and protect rural character.

Problems/Challenges	Solutions=>			Sectional	Fossil
	Solar	Storage	Tidal	Grid	Generation
35% county load growth population growth, transportation, heating	✓✓	✓✓	✓✓		✓
mainland energy prices extremes extreme winter and summer weather events	✓	✓✓	✓✓		✓
mainland energy outages projected imminent during extreme weather	✓	✓✓	✓	✓✓	✓
exceeding submarine cable capacity projected in early 2030s	✓	✓✓	✓	✓✓	✓
the winter problem load doubles, minimal rooftop solar generation	✓	✓	✓✓		✓
reduce county GHG pollution & ocean acidification 67% comes from transportation and heating	✓	✓	✓		✗
affordable farming and worker housing agrisolar + affordable farm and worker housing	✓	✓			

Environmental Climate Action Policy And Investment

“Show me your budget and plan, and I’ll tell you what you value.”

Which climate actions are the state, county, and
eco-nonprofits **advocating** and **funding**?

Climate Actions	OPALCO	WA	County	Eco Nonprofits
Research/Study	✓	✓✓	✓	✓✓
Decarbonization	✓✓	✓✓	?	?
Ocean Acidification	✓✓	✓✓	?	?
Ocean Warming	✓✓	✓✓	?	?
Wildfire Risk	✓✓	✓✓	✓	?
Vulnerable Community	✓✓	✓✓	?	?

FAQ Frequently Asked Questions

- OPALCO Mission
- Local Renewable Energy
- Climate Action
- Essential Public Facilities

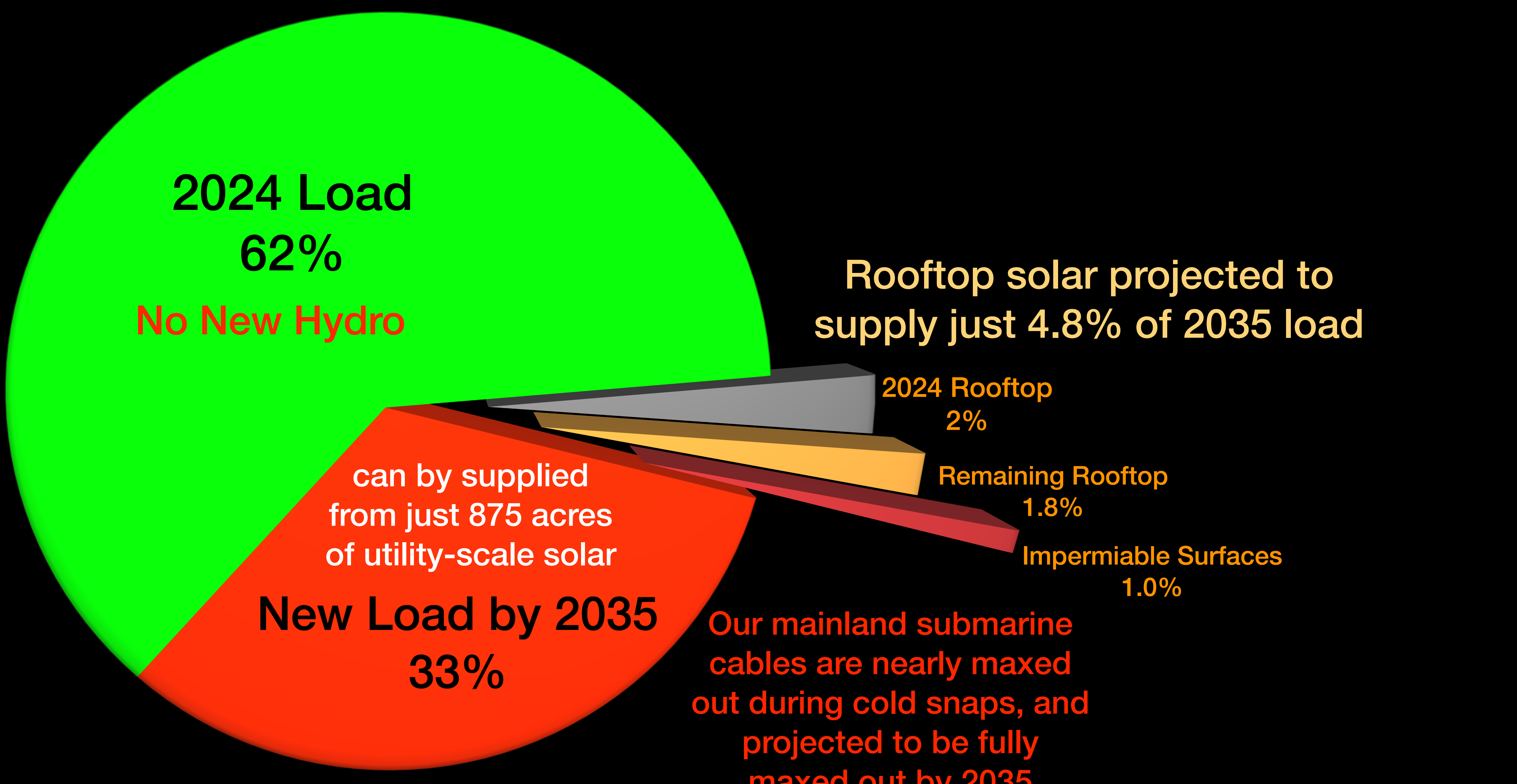
FAQ

OPALCO Mission

FAQ: What problems is OPALCO trying to solve?

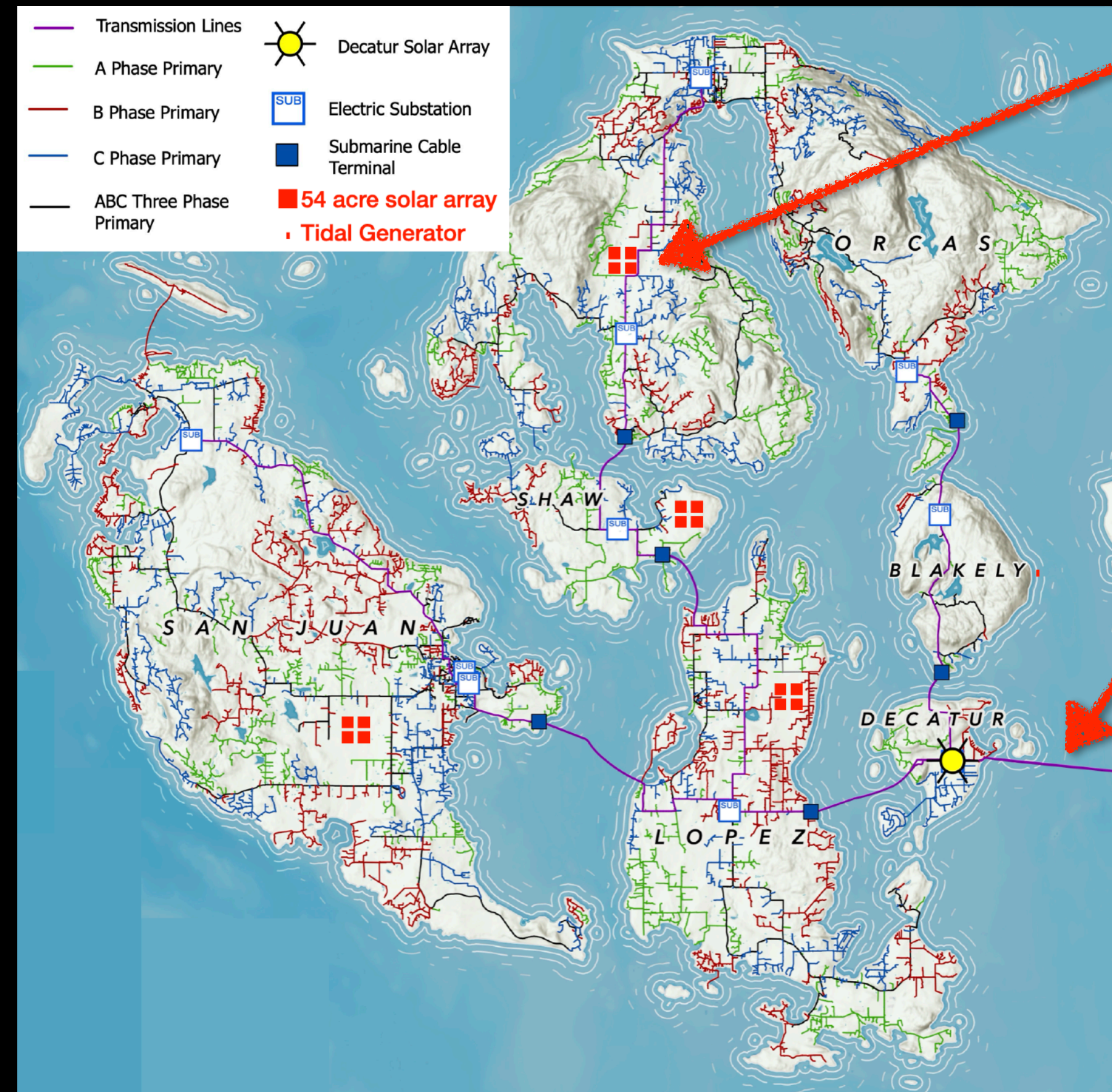
- Mainland electric load is exceeding supply
 - Shortfall starts this year, growing to over 30+ GW deficit by 2035
- Outages and price shocks are imminent (regional analysis)
 - 2024 January cold snap - grid almost collapsed, 800%+ wholesale price spike
- There is no new hydro
 - Snowpack shrinking due to climate heating => hydro trending lower
- New mainland renewables projects will take decades to deploy
 - Northwest needs to be adding 2,500 MW per year – 25X faster than normal
- Deficit mainly due to legal and permitting barriers that have historically slowed development to 125 MW per year
- Support global and state imperatives to stop burning fossil fuels
 - upgrade fossil-fueled heating and transportation to electric

To avoid supply/demand shortages, price shocks, and rolling blackouts requires **Local Utility-scale Solar**



2035 Projected Load: 336 million kWh sold

FAQ: What is OPALCO doing to ensure reliable local energy?



- Develop local utility-scale community solar + storage microgrids on 0.8% of county land
 - mitigate mainland outages and extreme price spikes
 - reduce dependence on the mainland
 - meet projected 35% new load growth through 2045
- Add third submarine cable to mainland
 - current submarine cable capacity projected to be exceeded in 2030s
- Switch It Up financing for energy efficiency, rooftop solar, storage
 - heat pumps, rooftop solar, battery storage, EV chargers, etc.

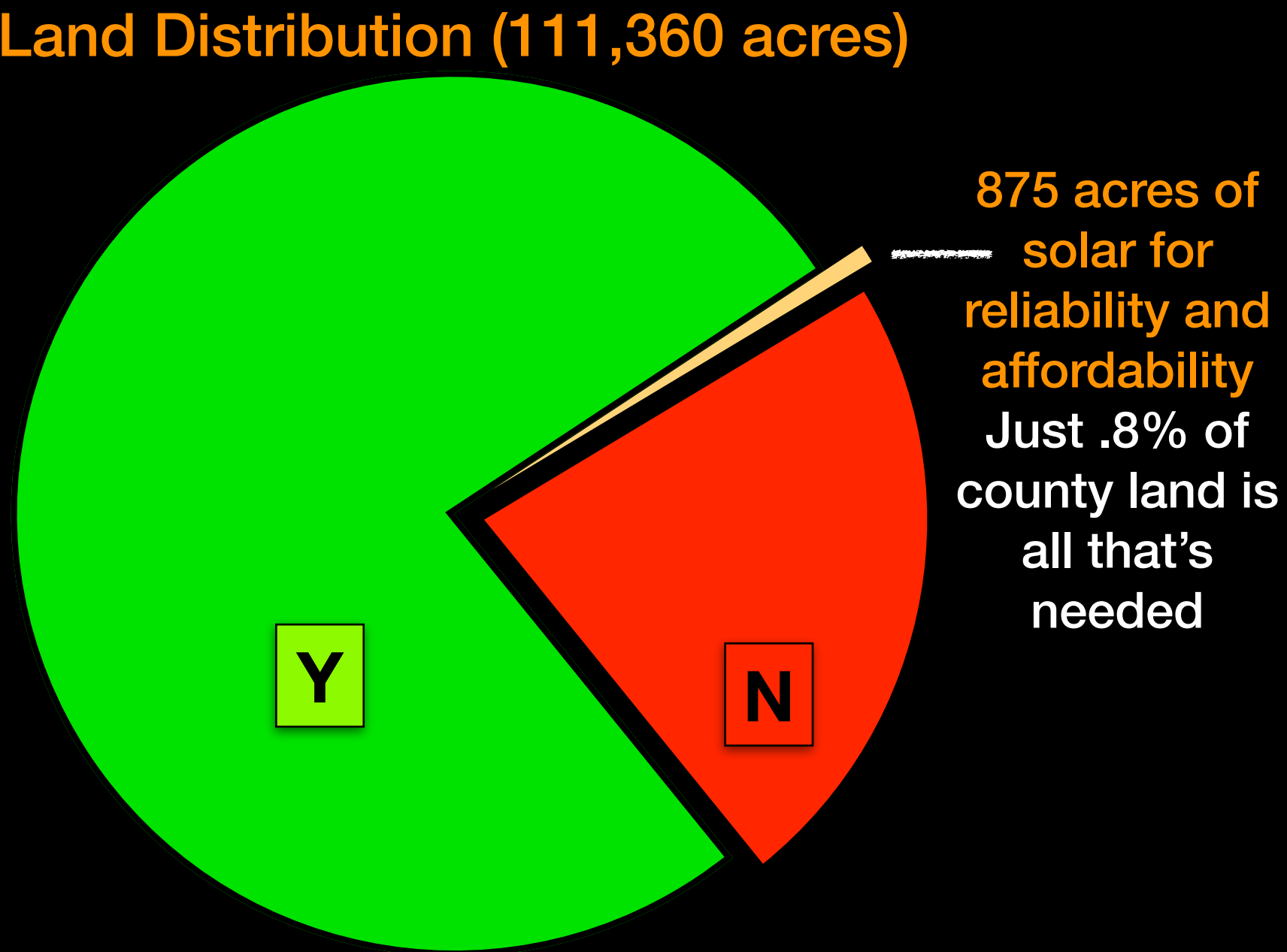
FAQ: How much land is needed to meet new county load growth?

- About 870 acres, less than 1%
 - Shortfall starts this year, growing to over 30+ GW deficit by 2035
- Outages and price shocks are imminent (regional analysis)
 - 2024 January cold snap - grid almost collapsed, 800%+ wholesale price spike
- There is no new hydro
 - Snowpack shrinking due to climate heating, hydro trending lower
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FAQ: Where would OPALCO community microgrids be located?

- Ideally, on each island that has a substation, and in proportion to the island population and load. See example table below.
- Land where farmers can benefit from increased crop production, climate adaptation, and economics.
- Land with poor soil conditions and few trees
- Avoid conservancy, and off-limits lands. See chart at right.

Island	2020 Population	2045 Population	Population Growth	Ferry Service?	Acres Per Island	Microgrid	Microgrid acres based on 2045 population	Microgrid acres based on island acres
San Juan	8,541	11,051	2,510	Y	35,234	Y	422	314
Orcas	5,772	7,468	1,696	Y	36,672	Y	285	327
Lopez	2,737	3,541	804	Y	19,079	Y	135	170
Shaw	253	327	74	Y	4,992	Y	12	44
Decatur - year round	71	92	21		2,255	Y	10	10
Blakely	41	53	12			Y	10	10
Waldron	142	184	42			N	0	0
Stuart	38	49	11			N	0	0
Other Islands	193	249	56			N	0	0
Total	17,788	23,014	5,226				875	875



FAQ: How are utility-scale energy projects funded?

- First and foremost, through state and federal grants wherever possible. Then, through co-op member subscriptions through OPALCO's community solar program. Beyond that, through rates similar to any other co-op infrastructure projects (e.g. substations, transmission, distribution, submarine cables, etc.)
- Grant Funding Essentials:
 - Need specific permitted renewable site locations to apply for grant funding.
 - Must complete projects in a reasonable timeline.

OPALCO Climate Action: Leadership in Funding Energy Efficiency and Local Generation

OPALCO has the highest levels of rooftop solar generation share of load in the state, plus outstanding energy efficiency programs

Switch It Up

OPALCO can utilize \$46.8M in Rural Energy Savings Program (RESP) funds to provide on-bill financing for co-op members for energy efficiency measures. OPALCO is reimbursed for the funds once member measures are installed. There are now 1,032 projects completed and billing for a total of \$20.9M net outstanding (total projects less member pay-offs). There are another 100+ projects in various stages of the process. Current project details are as follows:

partial

Measure	Project Origination Year							Grand Total
	2019	2020	2021	2022	2023	2024	2025	
Appliance					36,112	51,093	3,249	\$ 90,453
Energy Storage				39,510	27,159	47,766	17,379	\$ 131,813
Ductless Heat Pump	648,252	620,060	637,599	1,532,528	1,788,412	2,356,198	1,308,462	\$ 8,891,510
EV Charger						34,031	2,948	\$ 36,979
Fiber		30,725	48,681	29,301	41,929	85,080	4,492	\$ 240,207
Ducted Heat Pump	8,119	30,000	15,000	18,127	914,187	475,807	271,603	\$ 1,732,843
Heat Pump Water Heater	13,985	9,805		5,012	15,701	13,700	58,885	\$ 117,087
Insulation				256,935	42,634	240,729	680,235	\$ 1,220,533
Other	14,543			92,649	188,075	31,981		\$ 327,249
Solar + Storage				480,057	474,806	710,262	539,346	\$ 2,204,470
Solar				1,896,999	3,116,225	2,394,941	867,961	\$ 8,276,126
Windows				563,557	424,438	508,527	822,386	\$ 2,318,908
Grand Total	\$ 684,900	\$ 690,589	\$ 701,280	\$ 4,914,674	\$ 7,069,677	\$ 6,950,113	\$ 4,576,946	\$ 25,588,180

\$12M

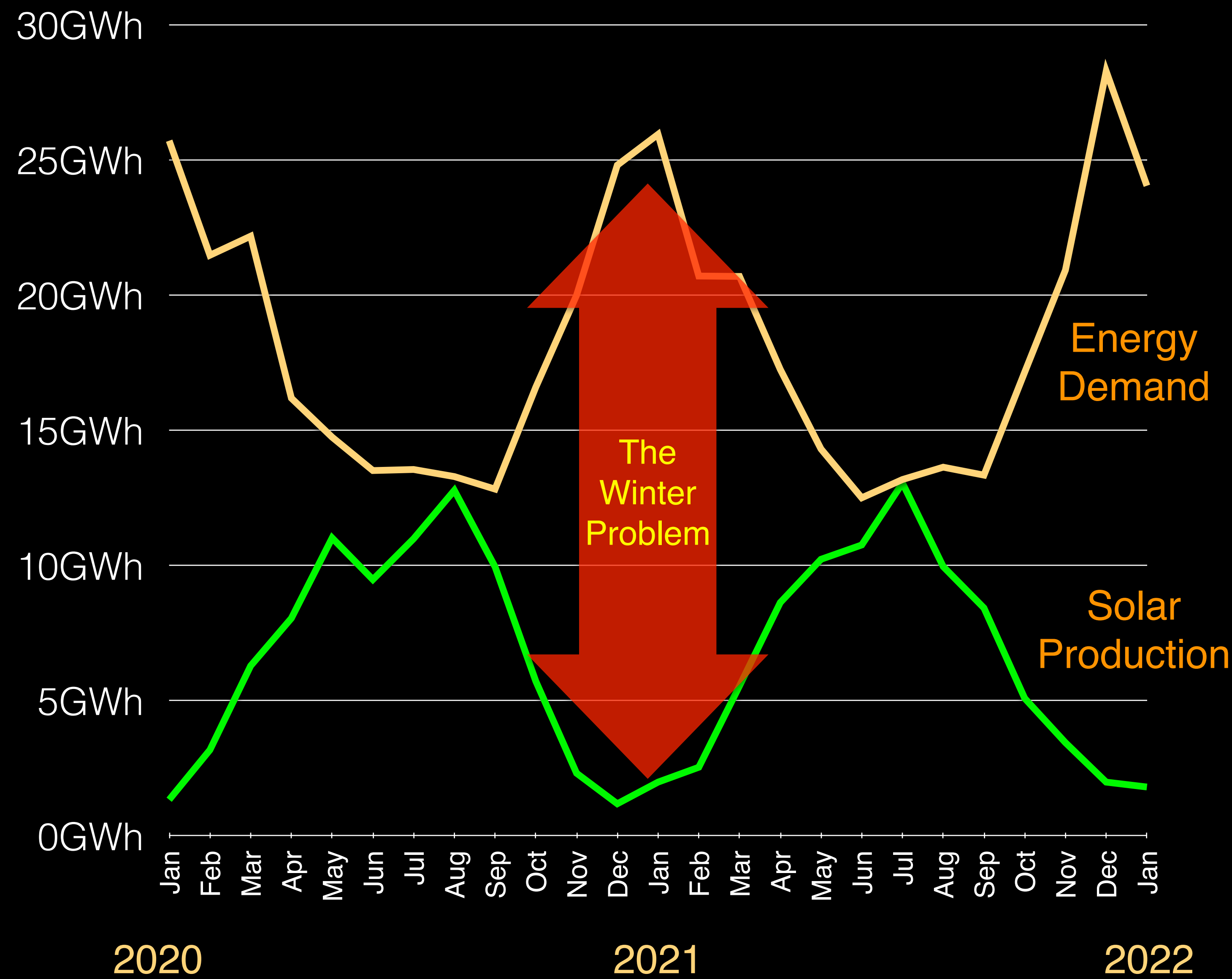
available for home, commercial,
parking lots, etc.

\$10.5M

FAQ

Local Renewable Energy

What if every home in the county had solar? **The Winter Problem**



If every home had good sun and had a 7.5 kW array, solar would only meet about 38% of the county's electric load.

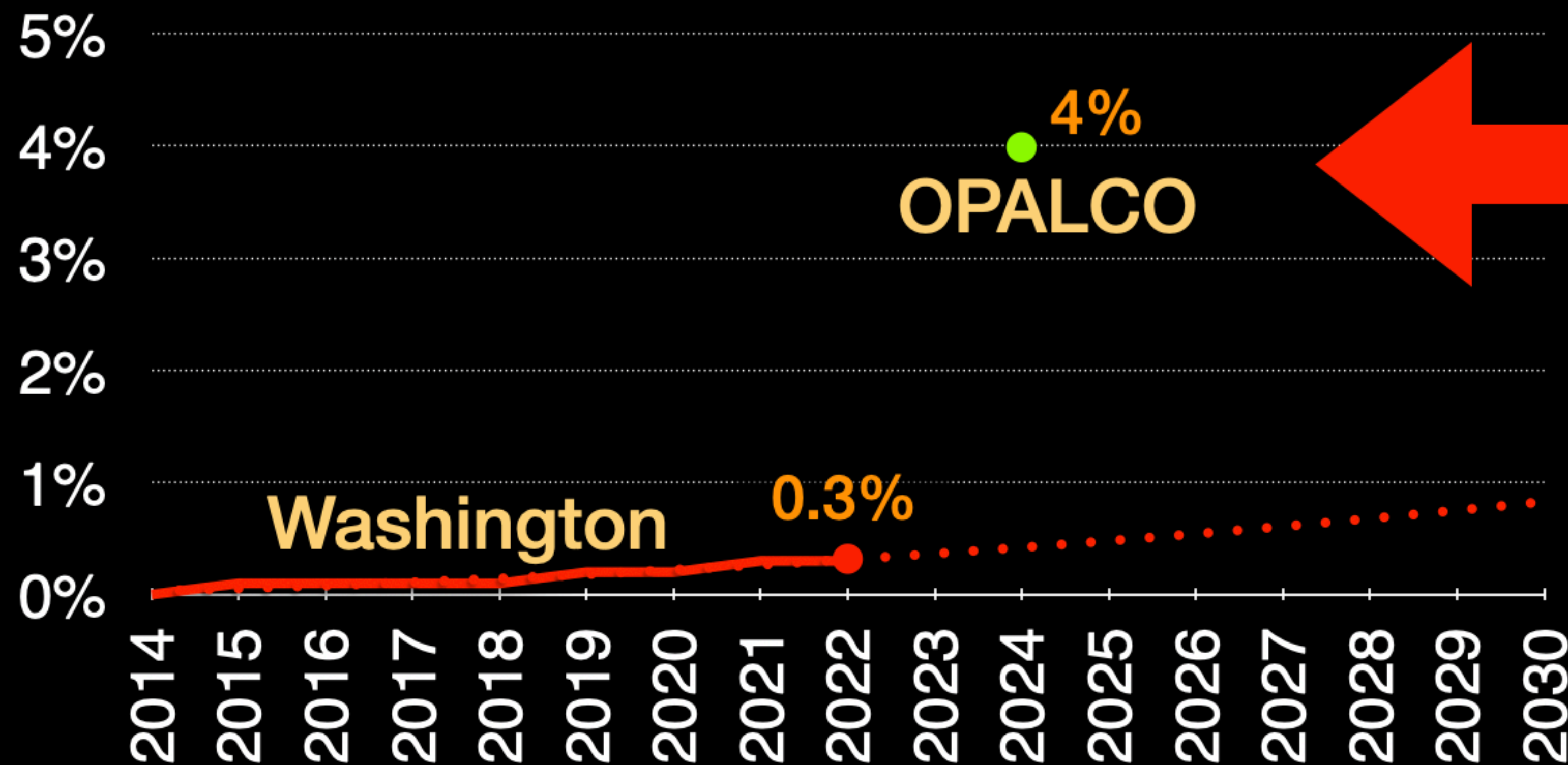
But less than half of homes have useful solar exposure. And shade will become more important as climate heating increases.

In winter, when load peaks, solar production is a small fraction of summer.

OPALCO Microgrids will have solar tracking to improve winter performance and multi-use storage that works during outages to power critical services.

FAQ: What role can rooftop solar play in meeting county load?

- Rooftop solar helps reduce county load. OPALCO estimates that about 5% of County load will be met by rooftop solar.
- OPALCO's rooftop solar members, Switch It Up program, and Renewable Generation Rate have lead to a remarkable rooftop share of load: 13X more solar generation than the Washington state average.



FAQ: What are the benefits of OPALCO Community Solar?

- Each community solar project is open to all members. It can be especially helpful for co-op members whose homes are shaded or those who want smaller arrays than would normally be economic.
- Community solar is typically lower cost than rooftop solar thanks to utility-scale efficiency, and potential state grants and incentives.
- Community Solar is an important step in reducing our dependence on the mainland and vulnerability to mainland energy price shock inflation.
- It also offers increased local energy resilience and the capability to re-route power for emergency services.

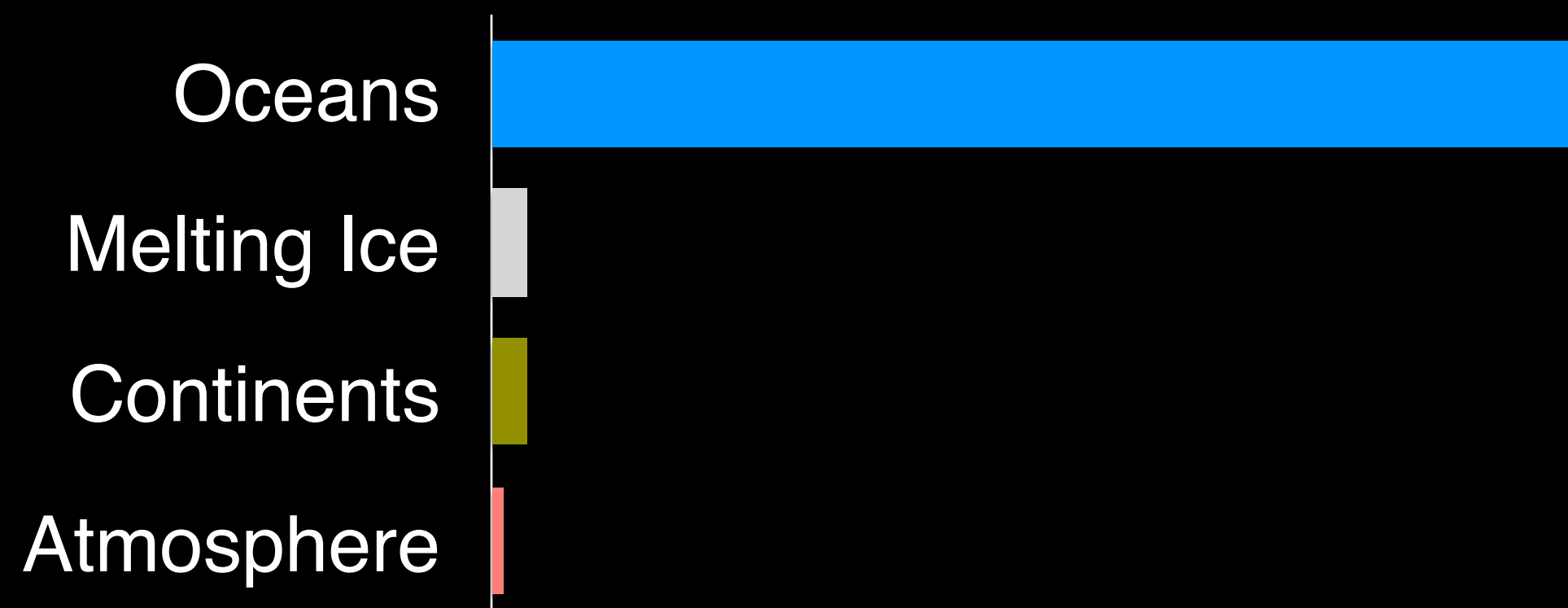
FAQ

Climate Action

FAQ: How can members help stop burning fossil fuels?

- Transportation and heating account for 67% of county GHG pollution
 - Replace fossil-fueled heating with heat pumps, insulate, weatherize
 - Replace fossil-fueled transportation with EVs, walking, bicycling, etc.
- “Show me your budget and plan, and I’ll tell you what you value.”
 - Ensure County Budget walks the talk: How much is actually budgeted to reduce GHG pollution and increase local renewable energy permitting?
 - Ensure environmental groups prioritize stopping fossil fuel burning: How much is actually messaged and budgeted to reduce GHG pollution?

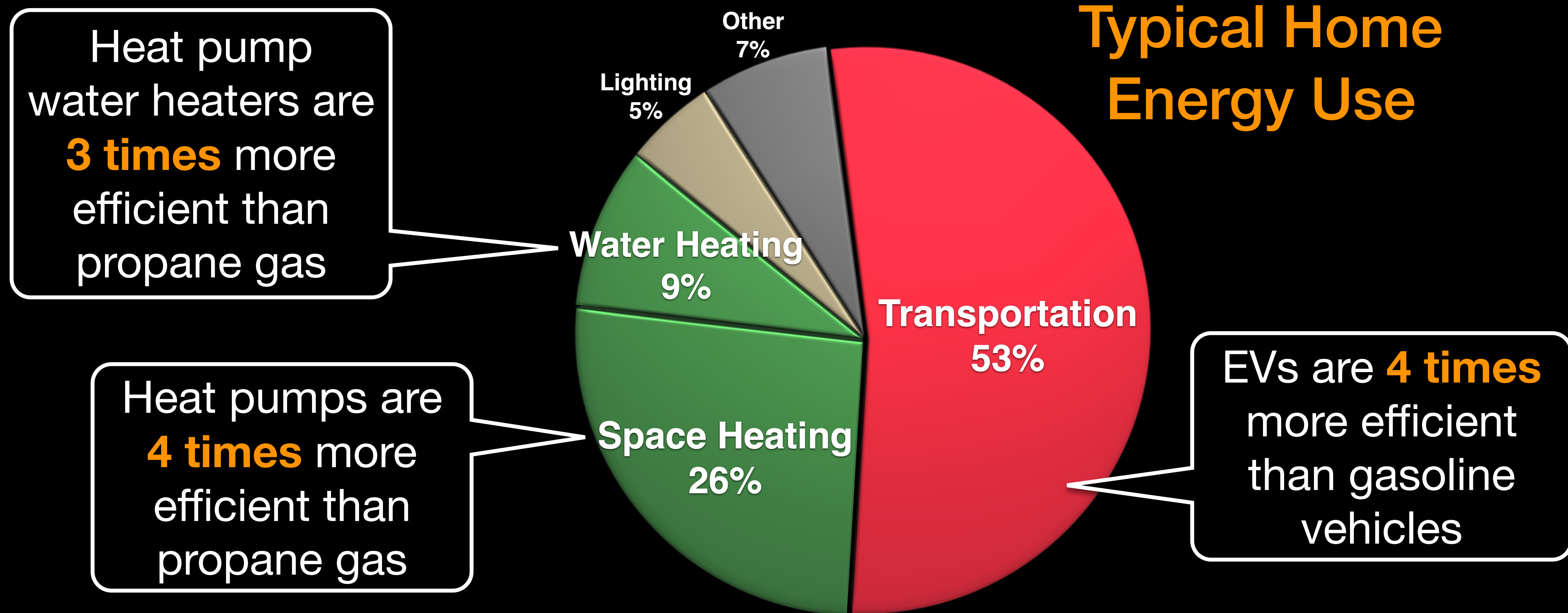
Where is the heat from global warming going?



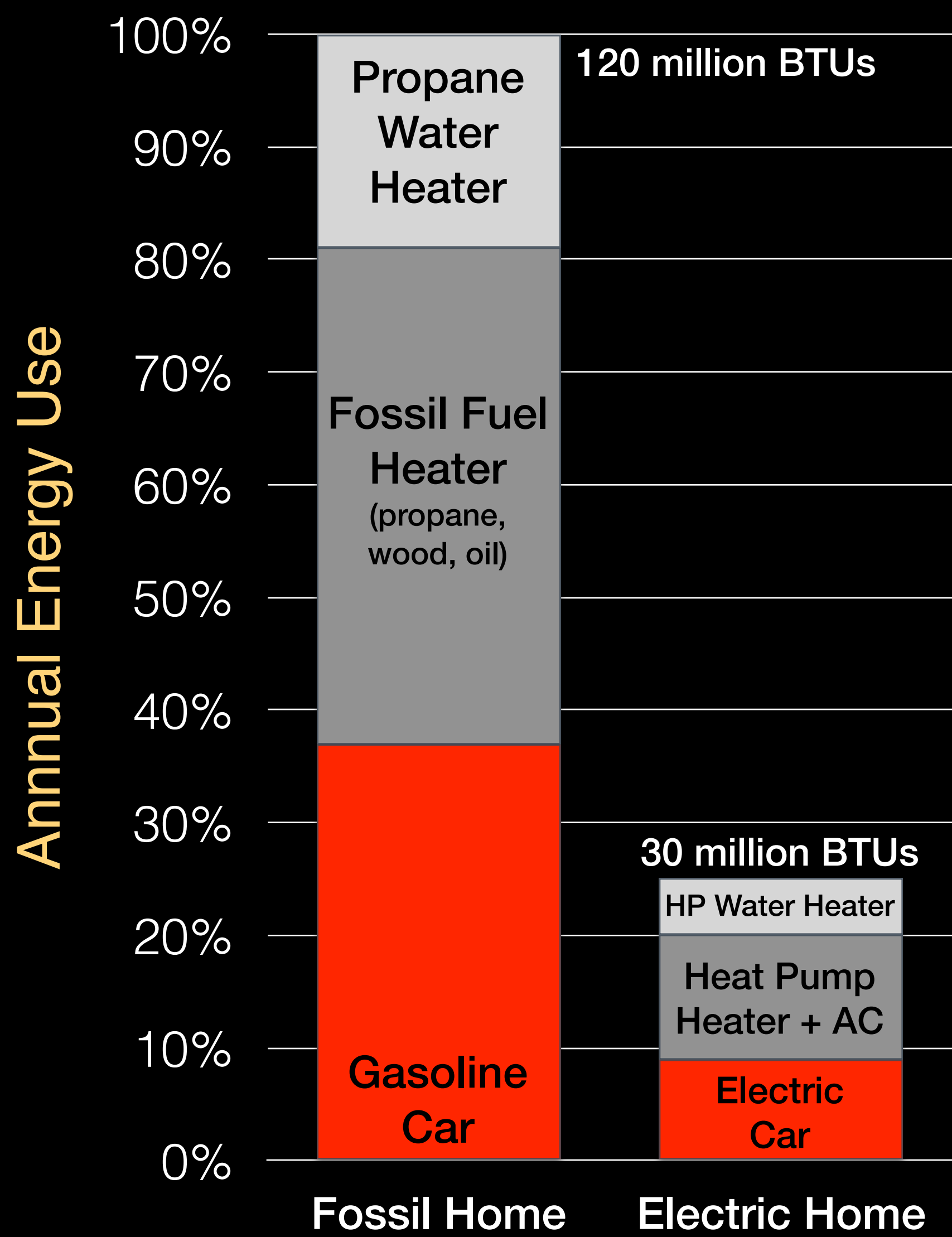
*Burning fossil fuels pollutes
our air and water, heats the
Salish Sea and increases
ocean acidification*

FAQ: How can members help reduce their energy use?

- Reduce waste by improving insulation, windows, and weatherization
 - add insulation to attics, floors, walls, upgrade windows, weatherstrip doors
- Convert fossil-fueled heating and transportation to electric
 - heat pumps and EVs are 3X to 4x more efficient

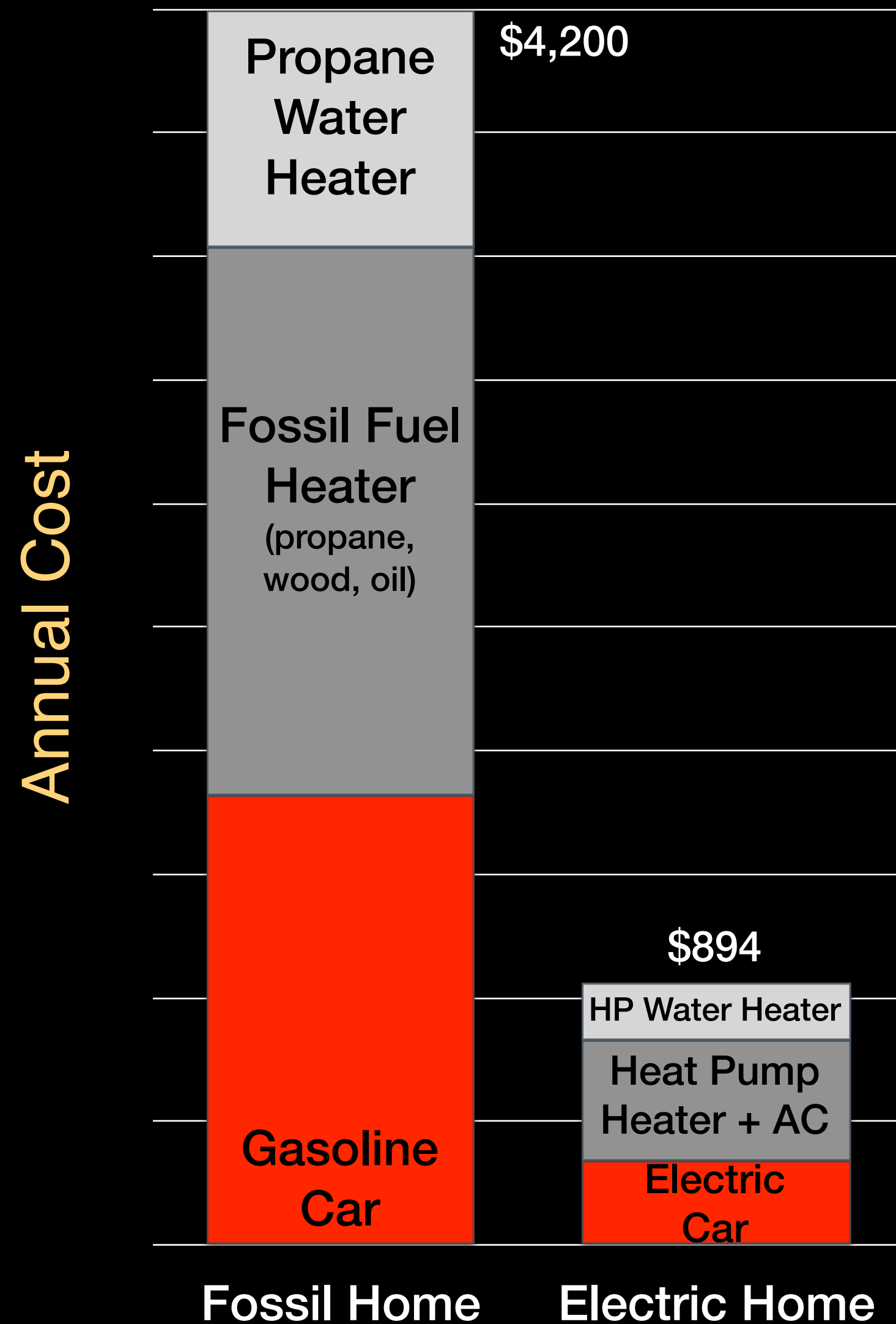


FAQ: How efficient are heat pumps and EVs



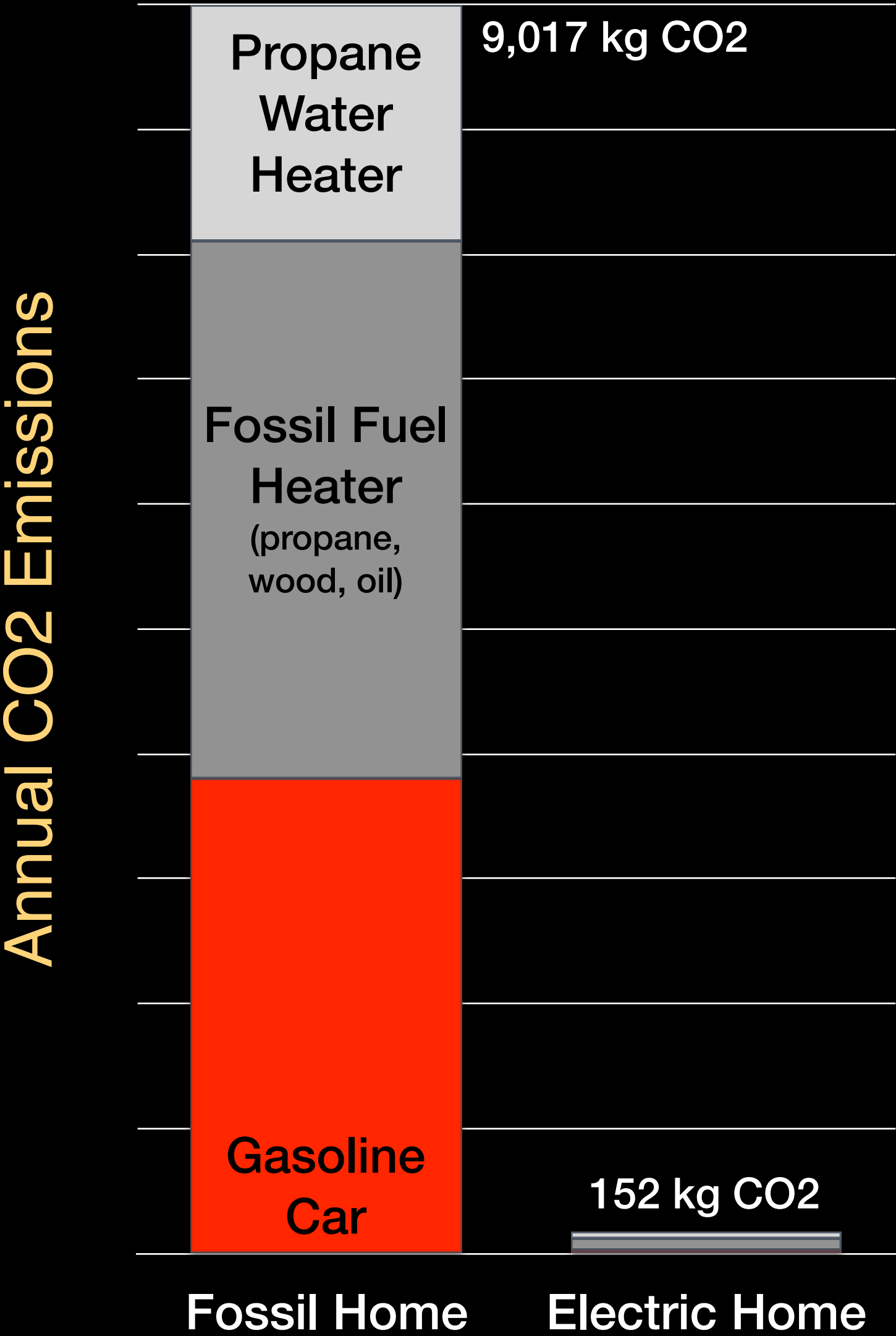
An all fossil-fueled county home typically uses 4X more per year for heating and driving.

FAQ: Do heat pumps and EVs cost less to use?



An all fossil-fueled county home typically cost about 4.5X more per year for heating and driving.

FAQ: How much GHG pollution does a fossil-fueled home emit compared to an all electric home?



An all fossil-fueled county home typically emits about 60X more pollution per year for heating and driving.

Typical SJC home (40 million BTU), and driving (10,000 miles per year, 26 MPG)

FAQ: What are some interesting facts about OPALCO members?

- OPALCO members are already among the lowest per-capita electricity users in Washington.
- The largest driver of electric load growth is population growth.
- San Juan county has the largest share of EV drivers in the state.
- OPALCO rooftop solar members generate a remarkable 13X more rooftop share of load than the Washington state average.
- Most of the energy imported to the islands is fossil fuels for driving and heating. It's expensive and dirty energy that harms our environment and health. Yet we hear from members they would rather see their energy dollars stay in San Juan County, instead of going to fossil fuel companies on the mainland.
- Driving electric means our transportation dollars stay local instead of fueling mainland oil companies.

FAQ

Essential Public Facilities
(EPFs)

FAQ: What are Essential Public Facilities?

Growth Management Act (GMA) identifies essential public facilities (EPFs) as facilities that are typically difficult to site but are crucial for public health, safety, and welfare, such as water, electricity, and communications infrastructure, and other services essential to public safety and health.

Maslow's Hierarchy of Needs

Self-actualization

moral,
creative,
spontaneous

Esteem

confidence,
self-esteem,
achievement,
respect by and for others

Love/Belonging

friendship, family, intimacy

Safety

security of body, of family,
of **Employment**, of health, of shelter

Physiological

Energy, Warmth, Food, Water, Shelter

*Utilities supply
fundamental services
essential to human needs.*

Essential Public Facilities



FAQ: Do EPFs comply with environmental oversight?

- Yes. Essential Public Facilities still must meet all oversight permitting processes, public hearings, and must meet state and federal regulations (e.g., wetland, storm water, NEPA, SEPA, archaeological, setbacks, etc.)
- Learn more at <https://www.opalco.com/quick-fact-renewable-energy-siting-criteria/2025/09/>

Addenda

- What problem are we trying to solve
- Agrisolar - harvesting the sun twice
- County Permitting Challenges and Opportunities
- Climate Action Protects Rural Character
- Rooftop Solar + Efficiency
- Permitting Evolution - some good news!

*What problem are we
trying to solve?*

Washington Energy Strategy Reality Check

During the January 2024 cold snap, the Washington power system almost collapsed

Between now and 2035, each year we are more at risk

Picture the loss of life and economic impact that took place in the 2021 Texas blackout

The Clock Is Ticking

- Regional loads growing faster than projected
- Coal plant shutdowns shrinking regional capacity
- New renewables projects will take decades to deploy
- **Shortfall starts this year, growing to 25,000 MW deficit by 2035**

source: Northwest Regional Forecast, 2023; PNUCC

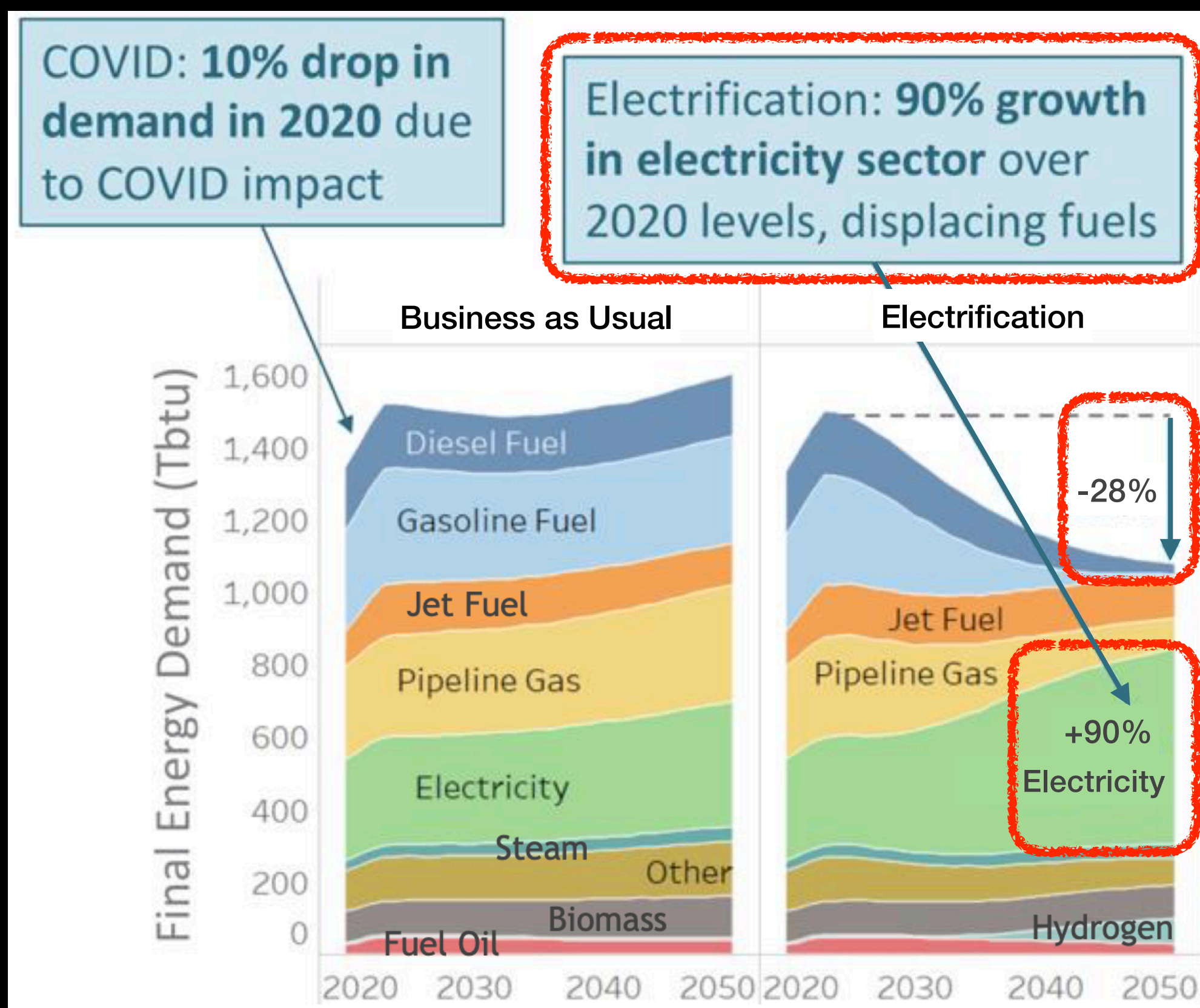
source: Transportation Electrification Strategy, 2023; WA DoT

- **Northwest needs to be adding 2,500 MW per year – 25 X faster than normal**

Deficit mainly due to legal and permitting barriers that have historically slowed development to 125 MW per year

WA 2021 Energy Strategy and Implications

*Decarbonization will reduce **TOTAL** energy consumption by 28%, by nearly doubling demand for electricity*



Energy Megatrends to Decarbonize Energy Supply

- ❖ Climate change → Decarbonization → Electrification Transportation and Heating
- ❖ Electric capacity decreasing dramatically 2025 coal plant shut down, hydro spill
- ❖ Solar and wind generation will be deployed to meet demand, but slowly
- ❖ California power play - NW hydro needed to stabilize intermittent solar and wind

If California were a country, it would be the fourth-largest economy in the world!

Major Challenges Ahead

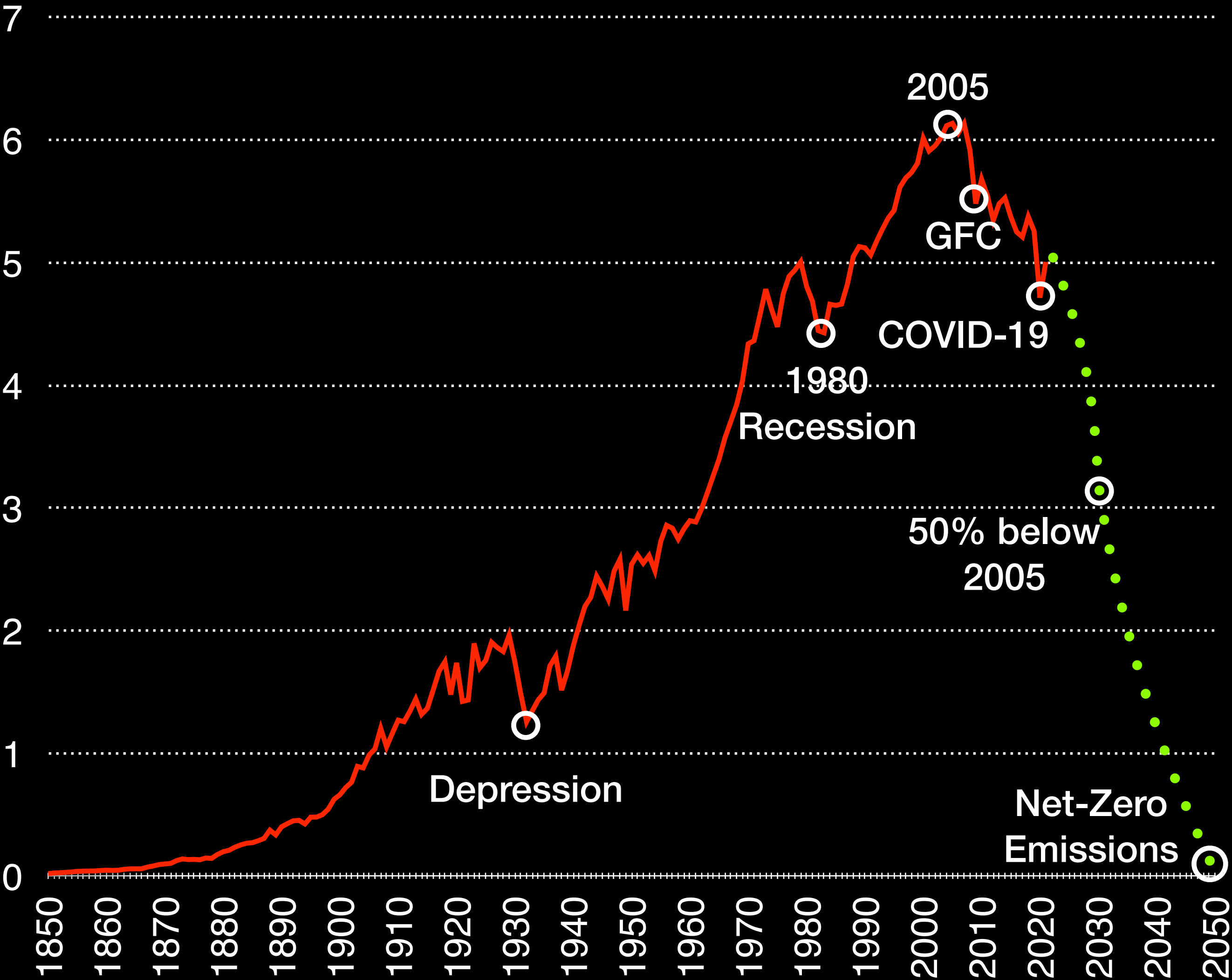
- ❖ Millions of acres of land will be required for solar, wind and transmission corridors
- ❖ Permitting/siting/acquiring new land resources will take years and capital - **NIMBY**
- ❖ Federal and State financial assistance will be needed to meet capital requirements

WA State Imperative: Cut GHG emissions in half by 2030

Key Messages

- Regional electric supply is not keeping up with demand.
- Requires massive new construction of renewable energy + storage.
- OPALCO mainland submarine cables will max out before 2035.
- By 2035, rooftop solar will supply less than 5% of local energy.
- There are no perfect local energy solutions. No free lunch.
- Without it, islanders will be hurt from regional outages and price shocks.
- OPALCO ready to do its part, but land use & UDC process needs to be streamlined.
- The clock is ticking. We need clear direction from County Council.

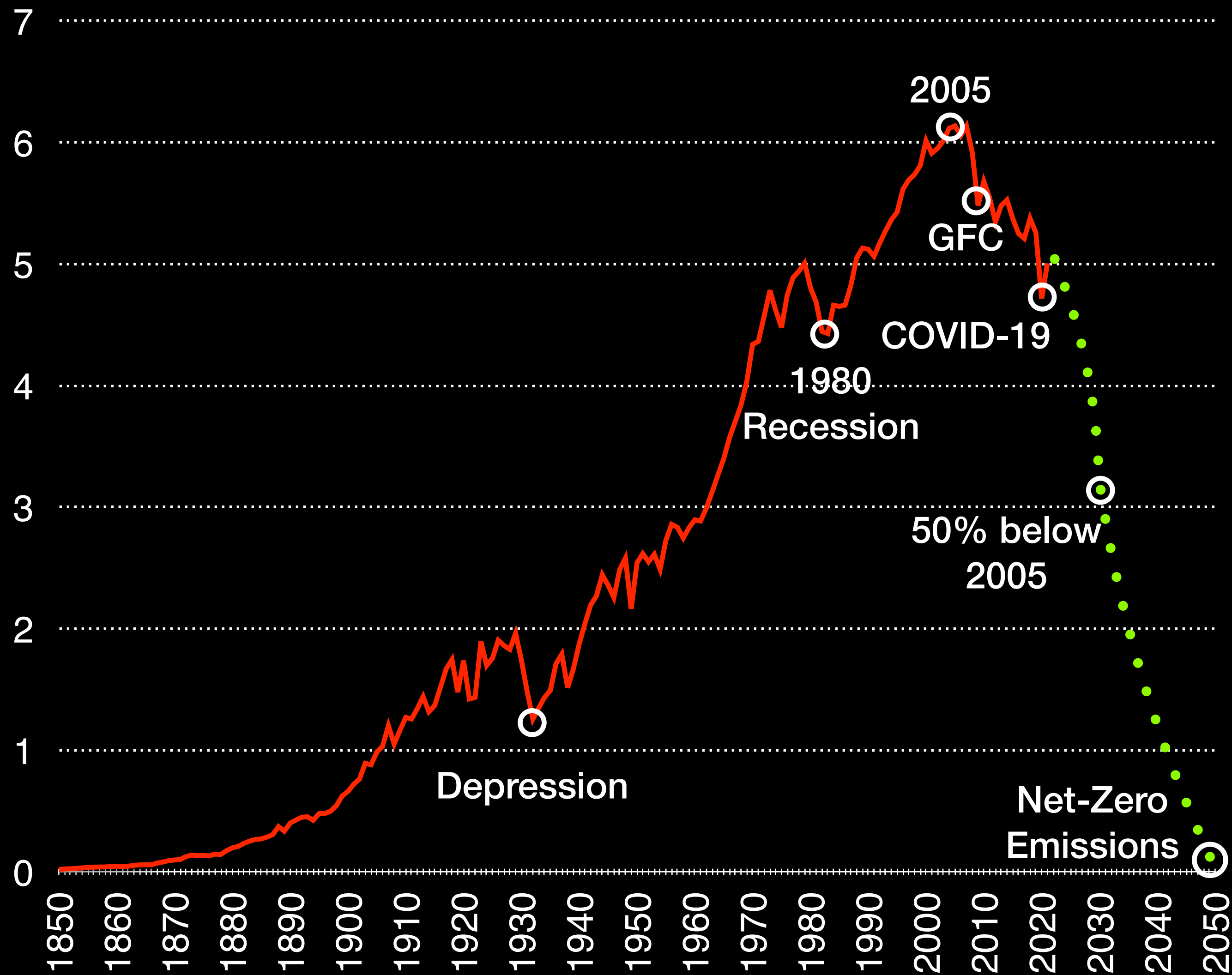
US Annual CO₂ Emissions: 1850 - 2050 (billions of tons - Gt)



Washington Objectives

- reduce GHG emissions 50% below 2005 levels by 2030, Net-Zero by 2050
- invest in infrastructure, renewables + storage, resilience, electrify transportation (cars, trucks, ferries, planes)
- delivering 40% of the benefits to disadvantaged communities
- increase clean-tech jobs
- substantial funds from WA departments of Commerce and Transportation

Delay is Denial: Only 5 years left to cut GHG emissions in half



Bailer Hill: A Giant First Step

- Equal to:
 - planting 44,000 trees per year, growing for ten years
 - removing 230 thousand gallons of gasoline, emitting 4.5 million pounds of CO2 per year
- Doubles county solar production at **6x less cost** of rooftop
- Utility-scale solar can supply 7x more energy, at a fraction of the cost, **on just 220 acres per island.**

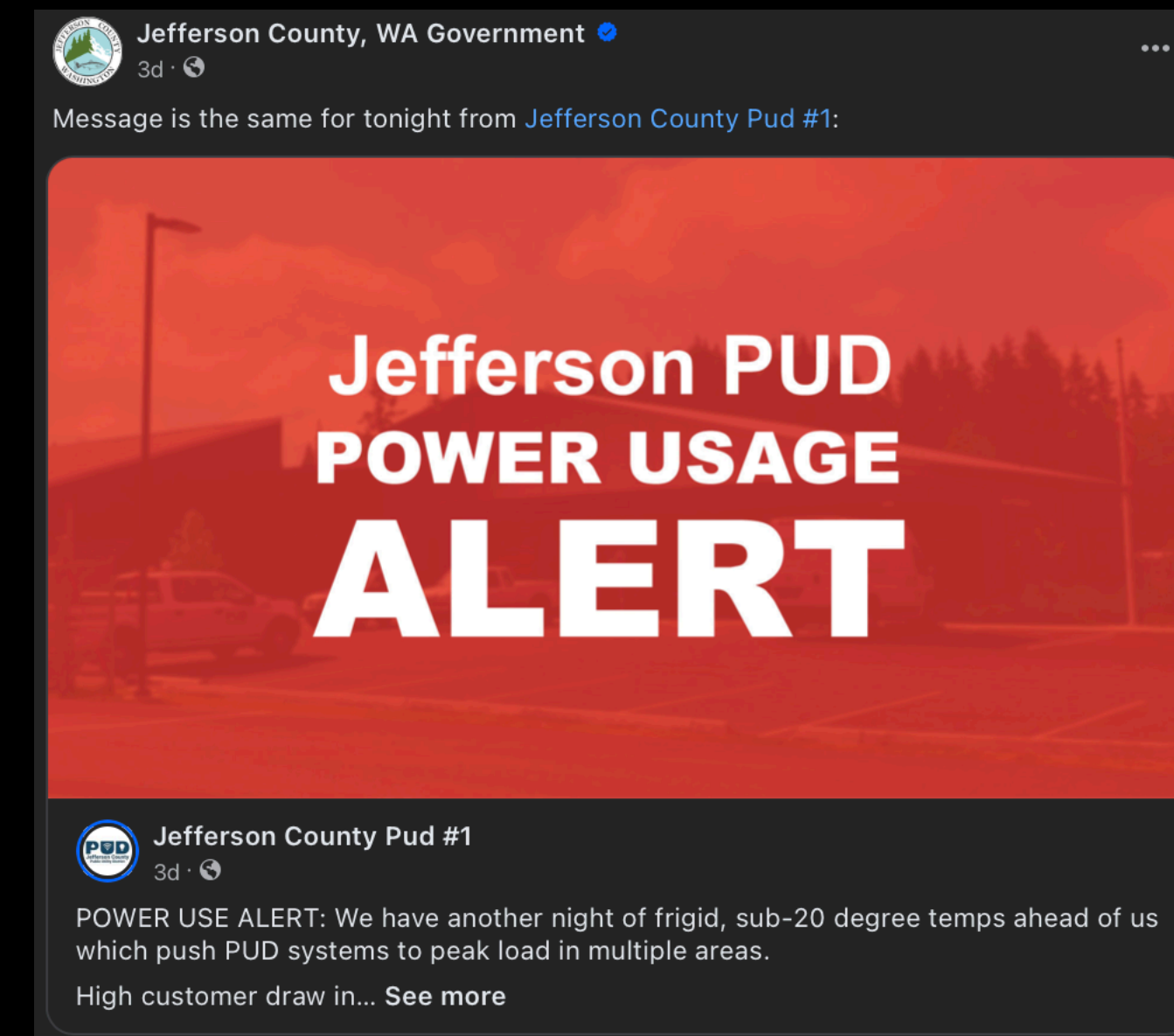
NW Regional Energy Strategy and Implications

*Decarbonization will nearly double demand for electricity,
while reducing TOTAL energy demand by 28%*

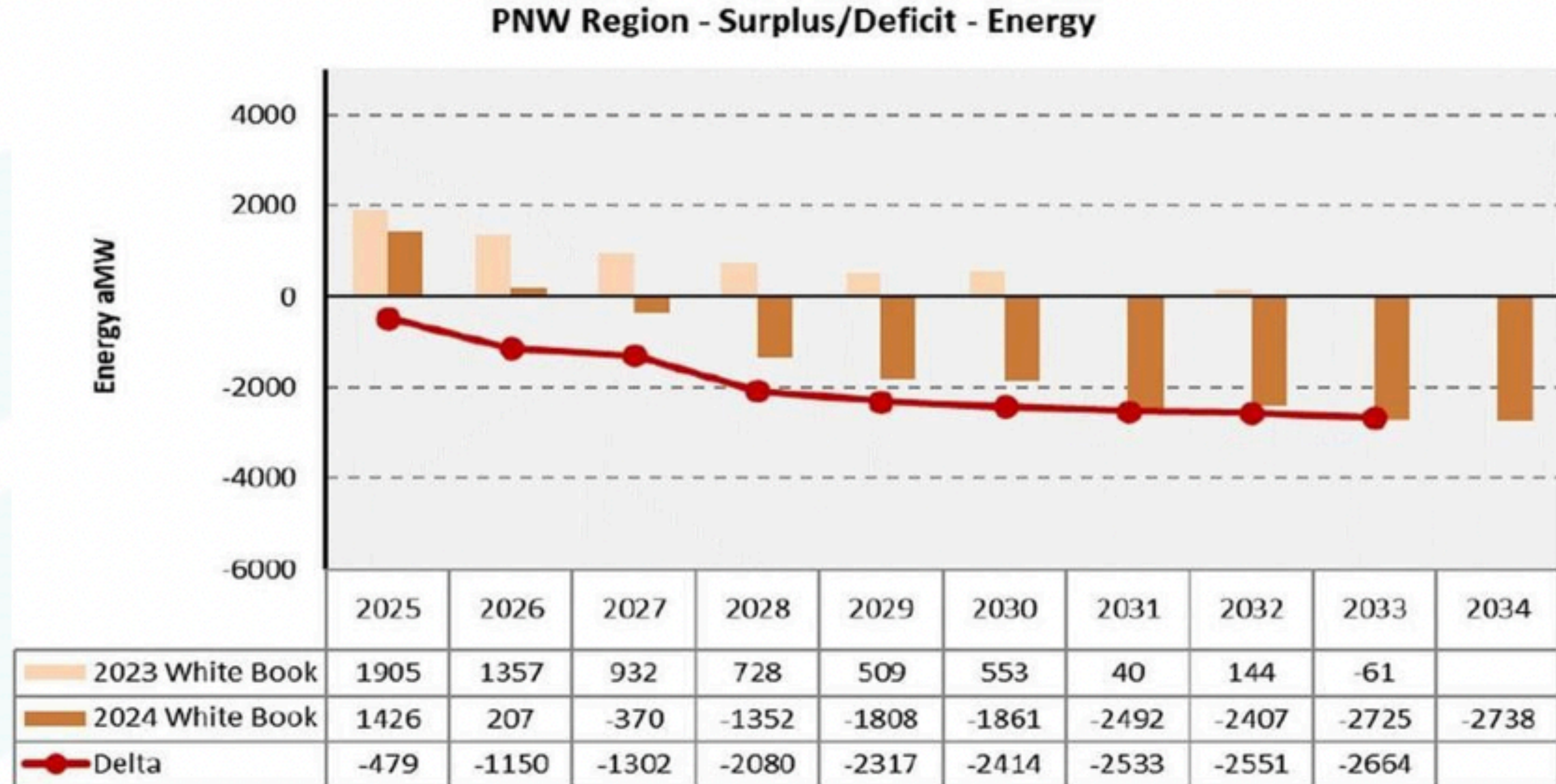
BUT - near term risk of load exceeding generation

Risk of major regional outages and public outrage

- Centralia coal plant shutdown in 2025 (comparable to about 10% of BPA Firm Energy)
- Significantly increased risk of major outages during cold snaps and heat waves (recent PSE, Jefferson Co. alerts)



NW Regional Energy Deficit Forecast Accelerating



From BPA's Load and Resource Study Shows Energy Deficits Starting in 2027 and Growing Rapidly in Low Water Years by Ernst, S. (2024). NewsData.

NW Power & Conservation Council: 6 August 2024 Planning and Analysis Study

NWPCC increased estimate to 30 to 70 GW needed in the NW

2030 NW New Energy Resource Buildout By Fuel Type (MW)



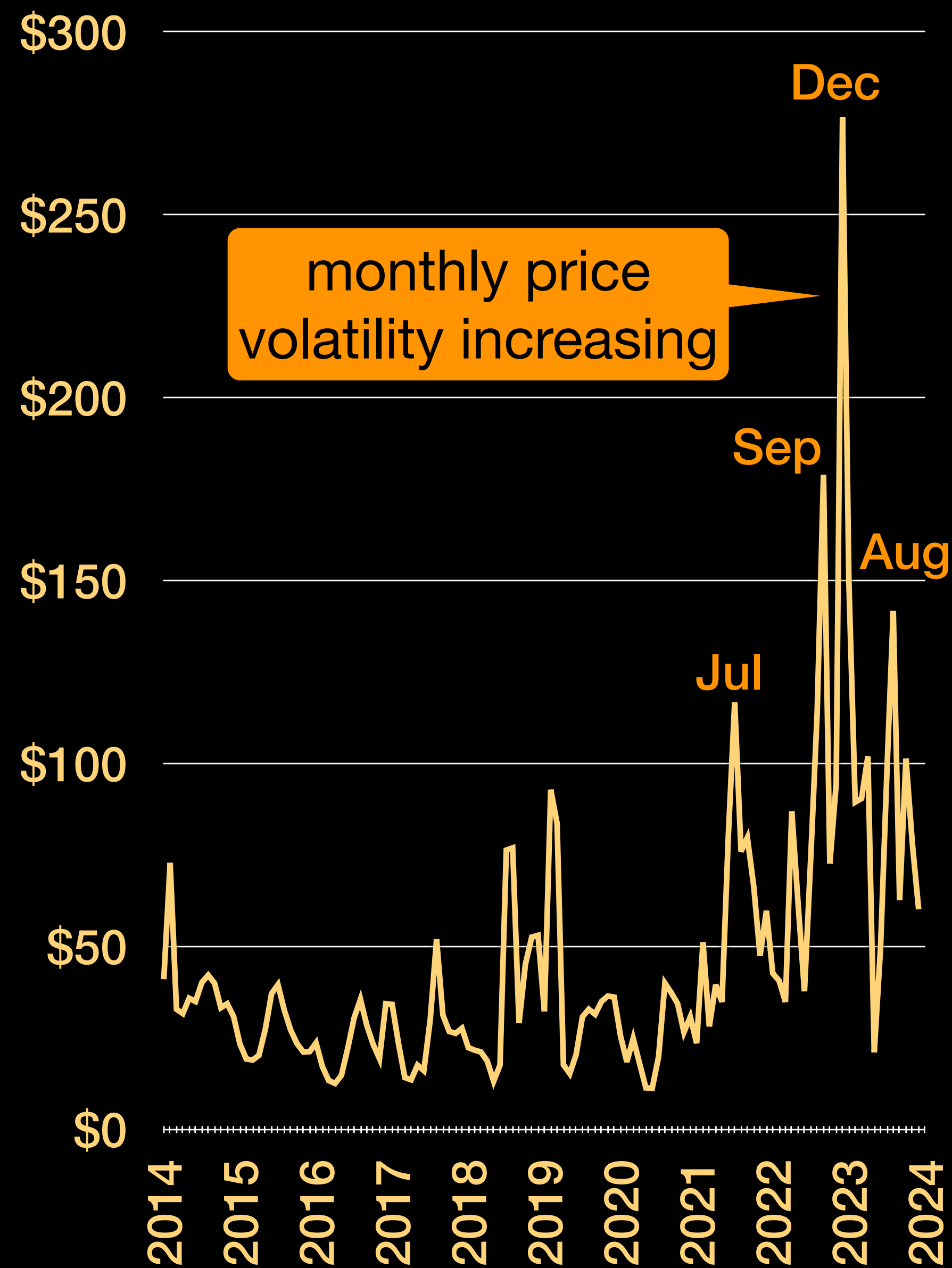
NWPCC just estimated over 400 GW needed across western region

“We should expect our total build to be between 406 and 613 GW, which is astonishing! That is the biggest number I have ever seen.”

NWPCC 13 August 2024 Study Presentation

Growing Supply-Demand Shortfall Inflating Mainland Electric Rates

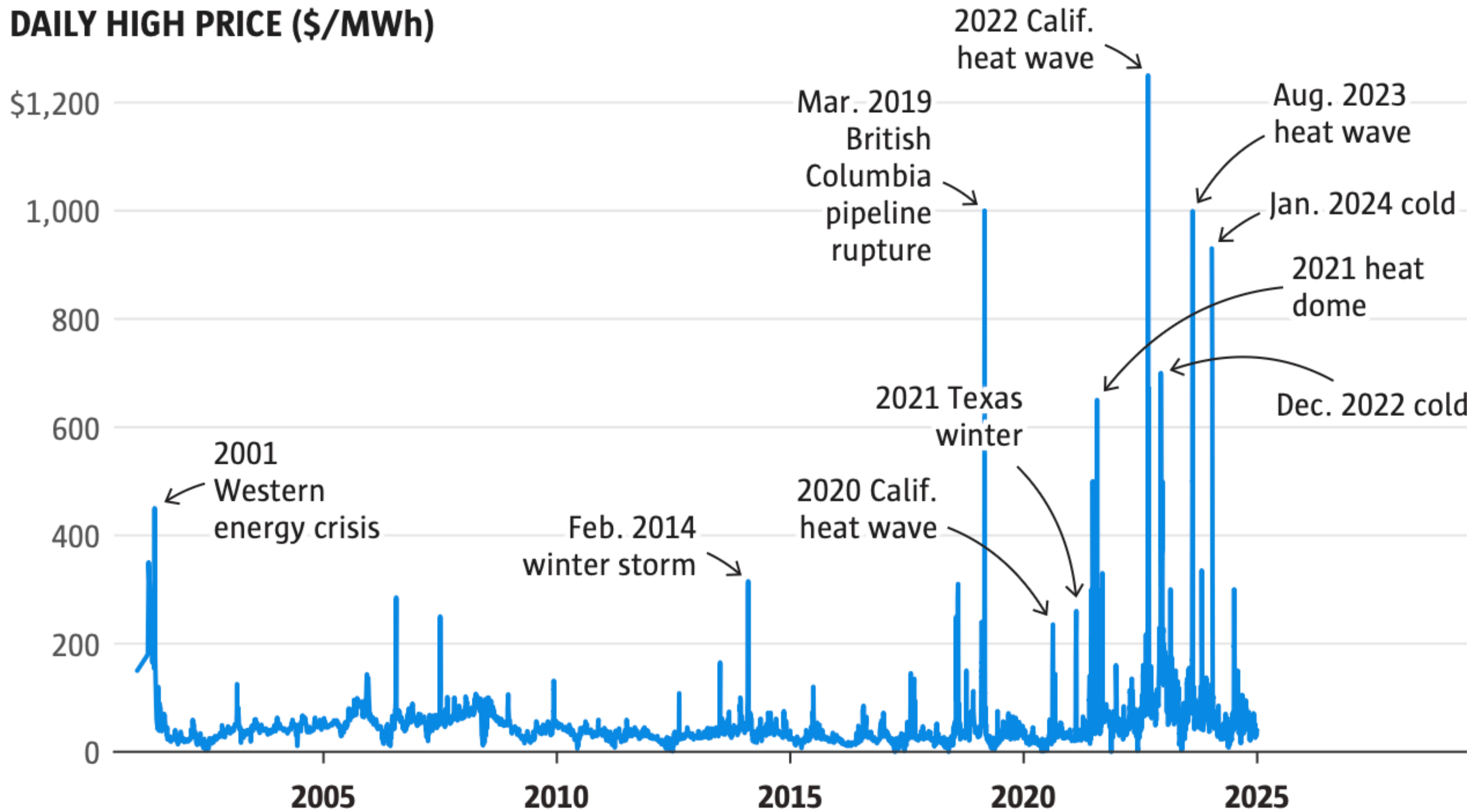
Mainland Weighted Avg. Market Price



Climate change is roiling power markets

Extreme weather events are upending reliability and price for the region's hydropower. The graph below reveals daily high prices in the Pacific Northwest mid-Columbia power market from 2001 to 2024. Peaks coincide with major storms, heat waves and other disruptions.

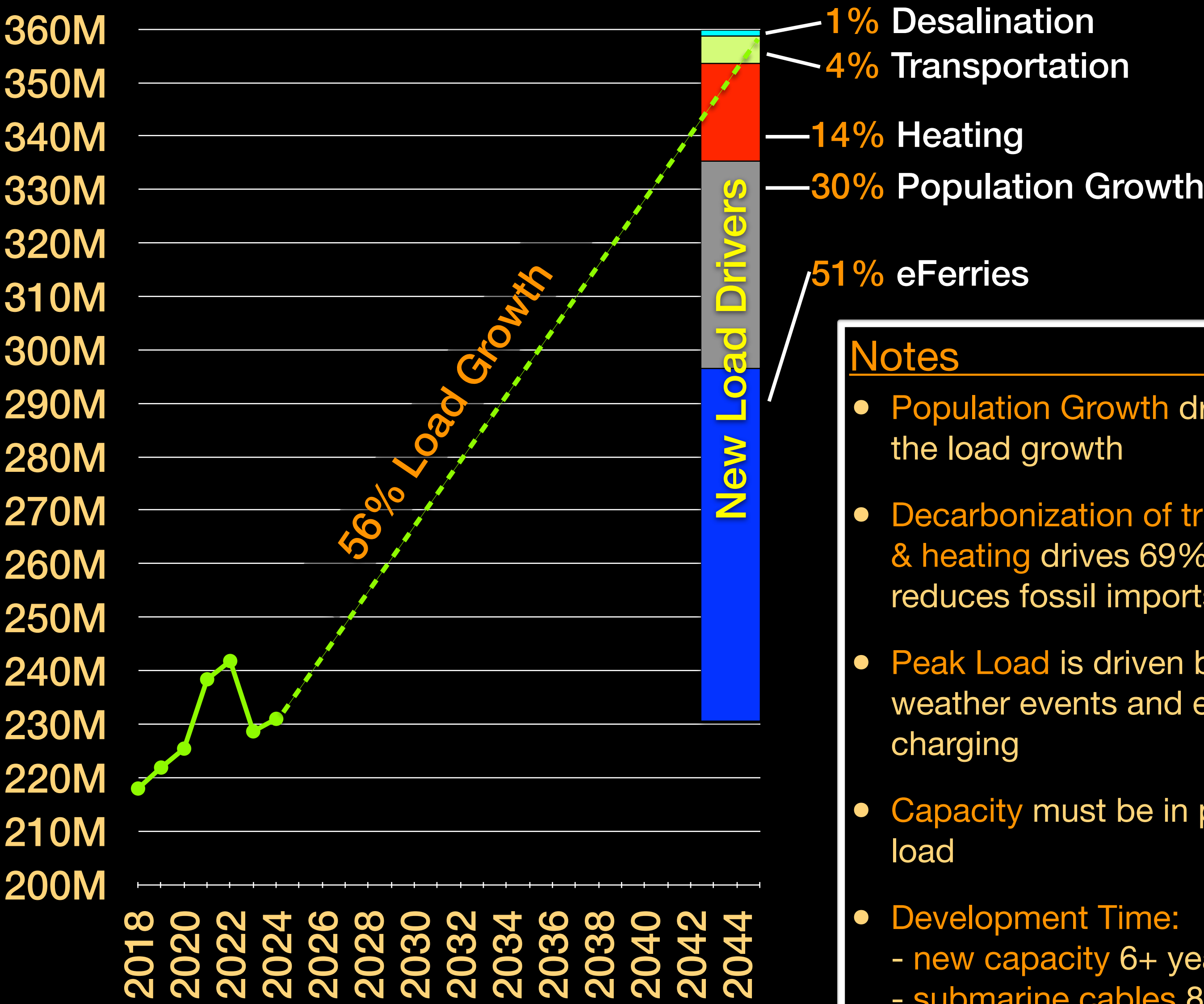
DAILY HIGH PRICE (\$/MWh)



U.S. Energy Information Administration (Fiona Martin / The Seattle Times)

OPALCO Annual Load Forecast Through 2045

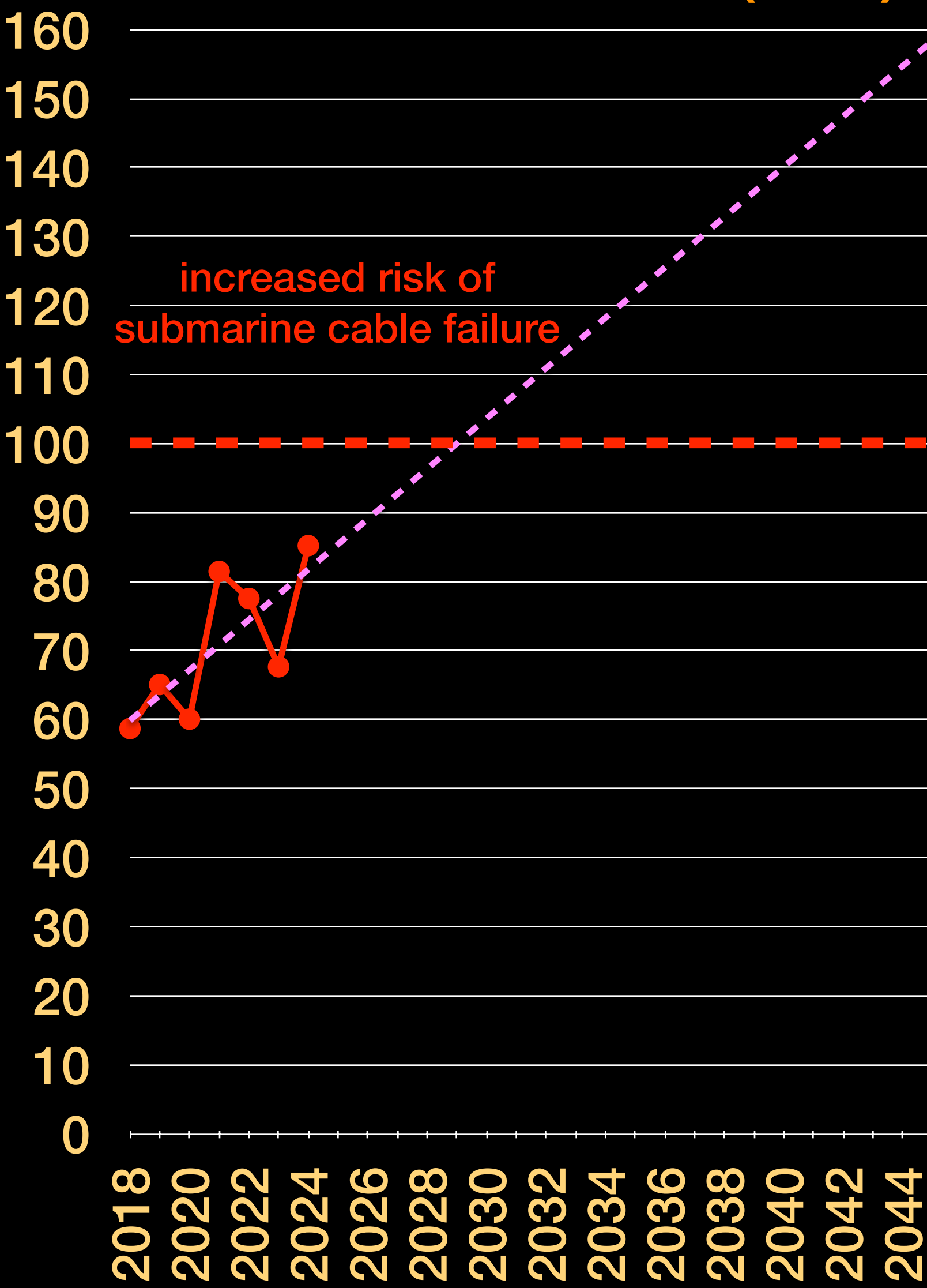
Annual Load (kWh)



Notes

- Population Growth drives 30% of the load growth
- Decarbonization of transportation & heating drives 69% growth, and reduces fossil imports/pollution
- Peak Load is driven by extreme weather events and eFerry charging
- Capacity must be in place before load
- Development Time:
 - new capacity 6+ years
 - submarine cables 8+ years

Annual Peak Load (MW)



What problem are we trying to solve?

- **Mainland Outages** - heat domes, cold snaps, WECC analysis, but not very much demand at risk hours
- **Submarine Cable Capacity Exceeded** - cold snaps, trending higher with population, once per year, a few days
- **BPA Demand Price Surges** - cold snaps, trending higher with population, extreme monthly BPA demand charges
- **Mainland Market Price Surges** - heat domes, cold snaps, a few hours to a few days
- **Post BPA Contract Wholesale Price Inflation** - year-round

Potential Solutions

- **Do nothing** - pass through mainland prices, outages just like now, build bigger submarine cable
- **Do nothing** - WA Governor blinks after first rolling blackout and embraces natural gas peaker strategy, still need to build bigger submarine cable
- **Diesel Generators on each Island** - land efficient, noisy dirty energy, used infrequently
- **Local Microgrids** - need 875-acres, caps price of Tier one and some Tier 2 mainland power, extends submarine cable life and runway for new cables, powers county during 3 sunny seasons and critical services during winter
- **Dispatchable Member Storage** - mitigates mainland price surges,

California Is Actively Pursuing Our Northwest Energy Supply

If California were a country, it would be the fourth-largest economy in the world!

Need a power line? That'll be \$3B and 18 years.

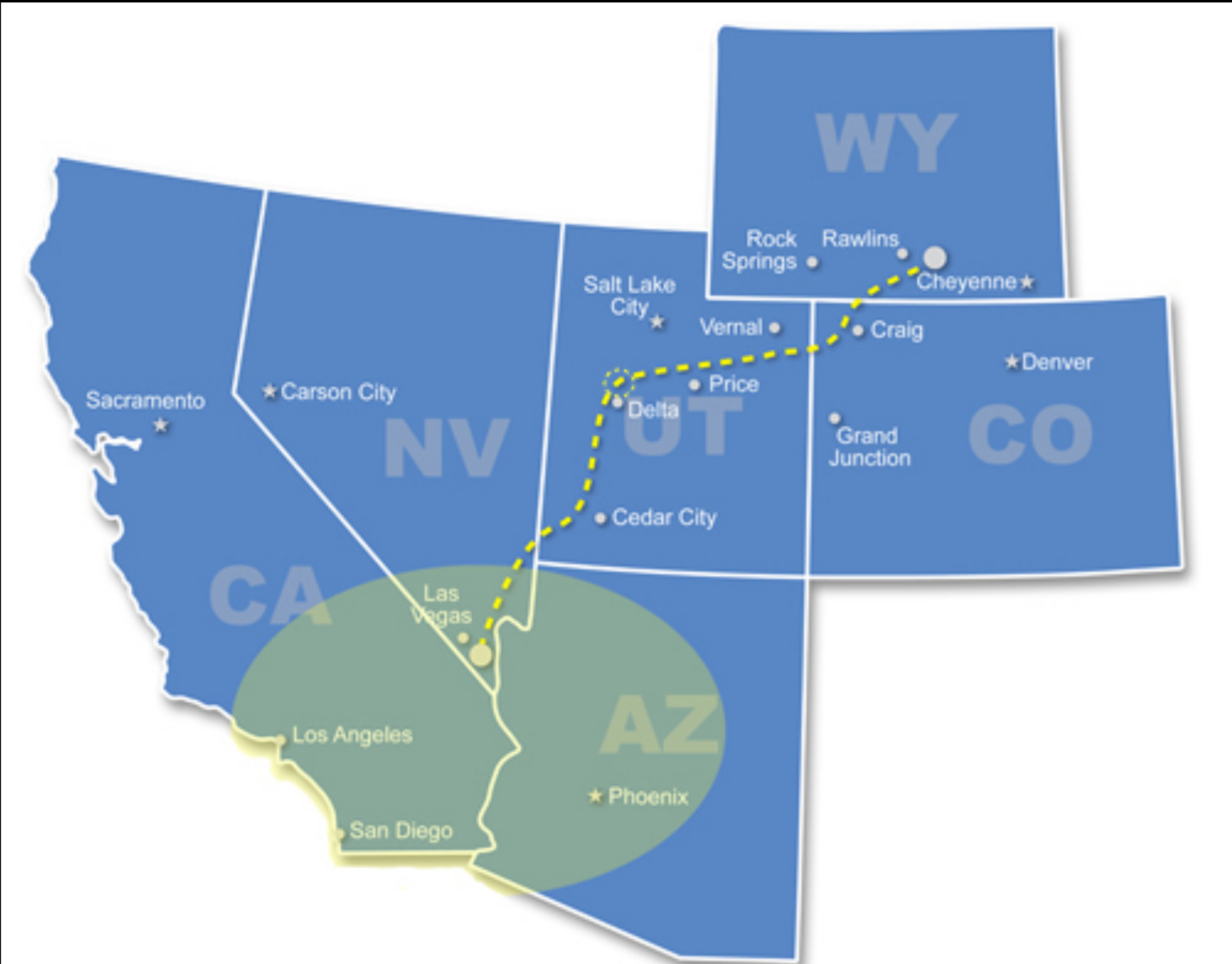
By ARIANNA SKIBELL | 06/21/2023 05:59 PM EDT



Interior Secretary Deb Haaland (center left) and Energy Secretary Jennifer Granholm (center right) arrive at a ceremony for the TransWest Express transmission line in Wyoming. | Jason Plautz/POLITICO's E&E News

A 732-mile power line broke ground in Wyoming this week, paving the way for the country's largest onshore wind project to send zero-carbon energy to California, Arizona and Nevada.

While the \$3 billion TransWest Express Transmission project marks a win for the Biden administration, it took nearly two decades to green-light, [writes Jason Plautz](#).



How Long Will it Take to Develop 25+ GW of Renewable Resources?

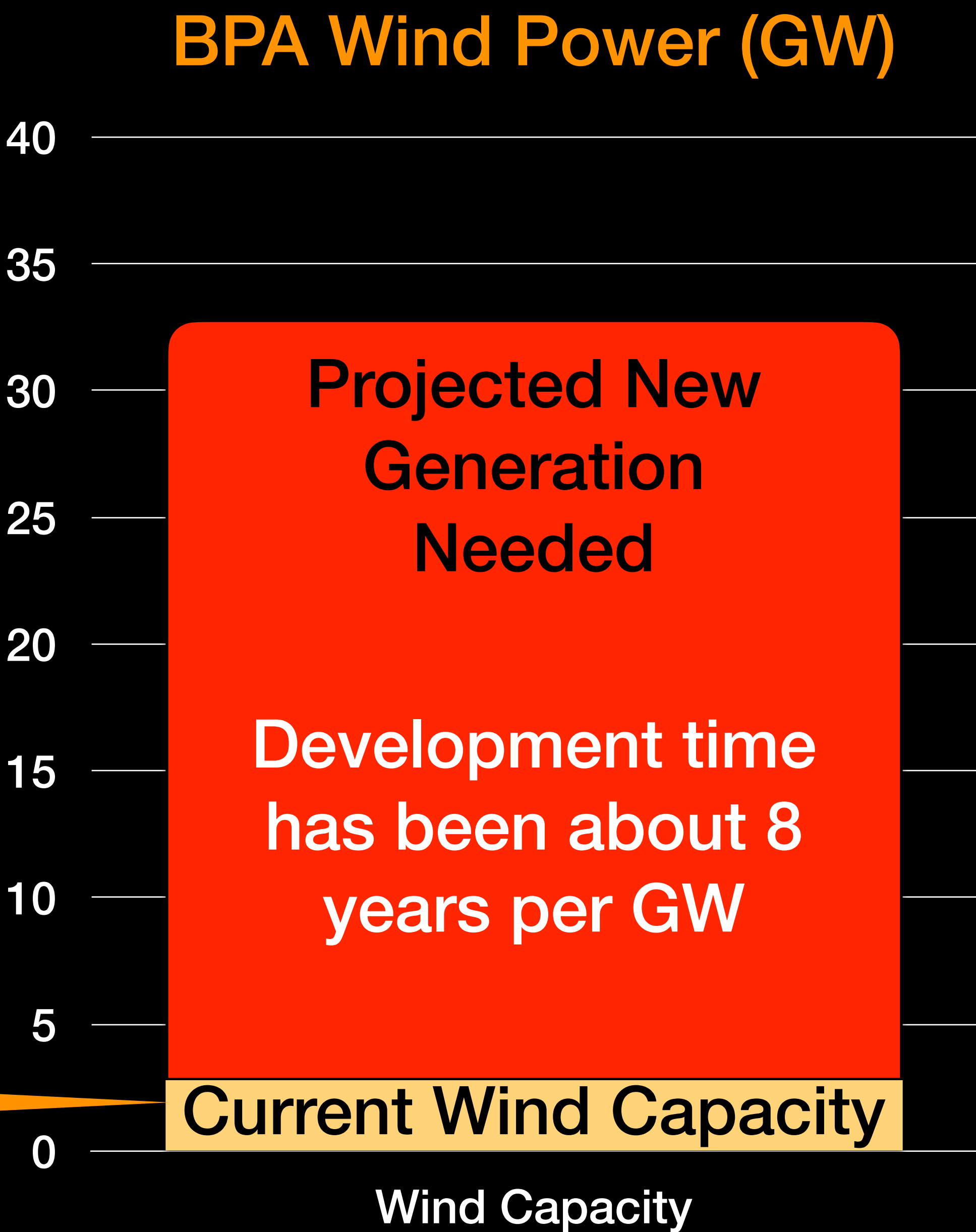
National Resistance to Renewables

“Local governments are banning green energy faster than they’re building it.”

2024 USA Today Study

There are over 300 wind power projects held up by court cases

25 years to develop

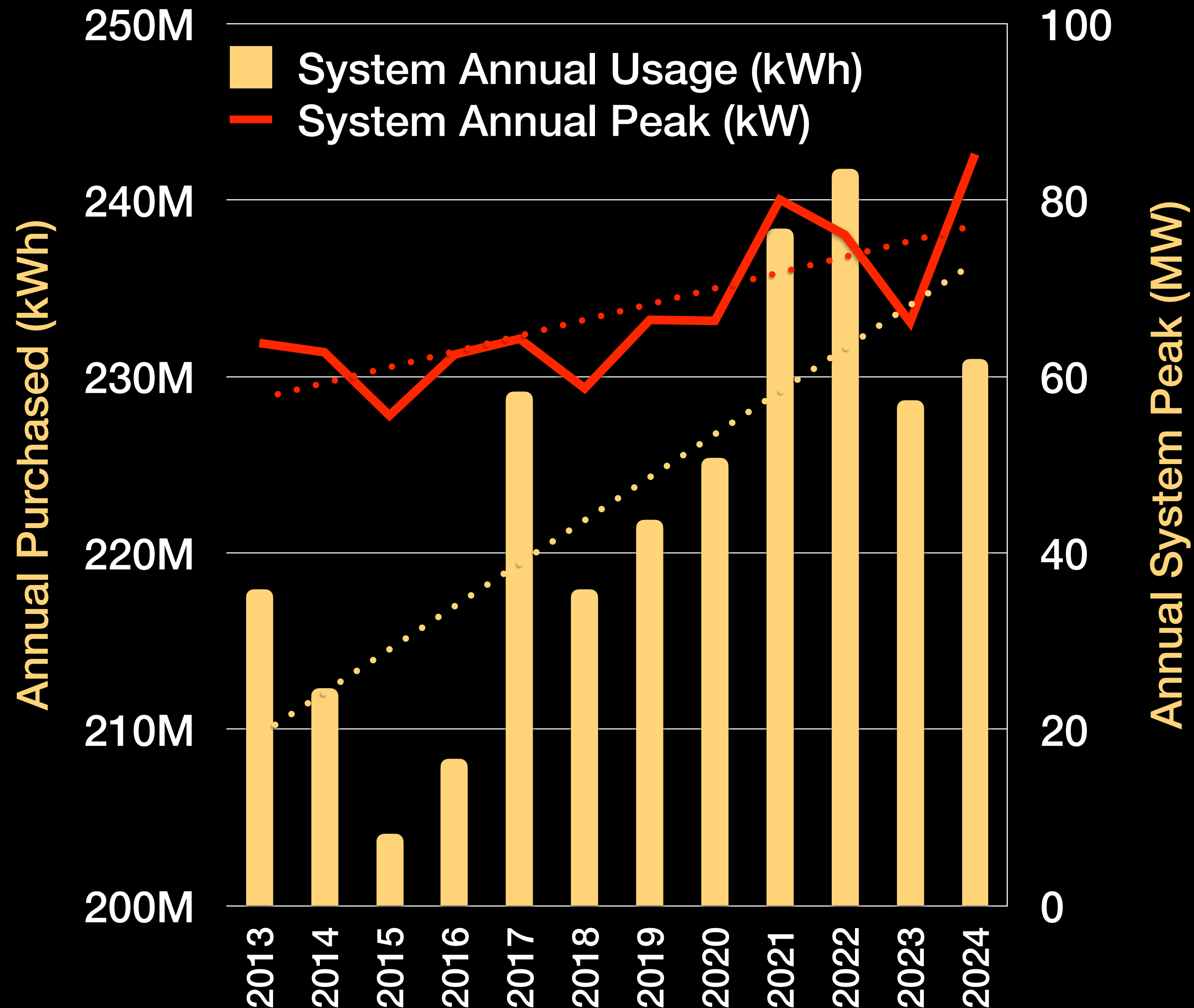


Reality Check: NW New Energy Development

- 121 GW have been withdrawn!
- 182 GW are being “studied,” meaning an unknown energization schedule!
- 8.7 GW have been energized in the last 24 years!
- And BPA is only planning on 6 GW of increased transmission capacity!

Fuel Source	Study	Study Completed	Received	Energized	Withdrawn
Solar	102,679	3,787	322	466	41738
Wind Turbine	35,208	3,164	0	6,021	40085
Battery	32,258	2,125	0	9	5004
Other	16,591	1,866	1,039	2,937	
Narural Gas	350	1,100	0	2,019	34497
Biofuel	10	0	0	71	
Pumped Storage	1,100	0	0	0	
Geothermal	10	0	0	0	
Water	0	0	0	135	
Total	171,615	10,176	322	8,721	121,324

Annual BPA (kWh) Purchased and System Peak (kW)



Notes

- **Purchased CAGR**
 - 2013 to 2025: 0.53%
 - 2013 to 2020: 0.30%
 - 2020 to 2025: 0.61% (2X)
- **System Peak CAGR**
 - 2013 to 2025: 2.67%
 - 2013 to 2020: 0.67%
 - 2020 to 2025: 6.47% (10X)
- **Submarine Cable Limits**
 - 1983 Cable: 150 MVA
 - 2001 Cable: 100 MVA
- NERC's N-1 criterion states that the grid must be able to withstand the failure of any single critical element without causing system-wide reliability problems. The 2024 cold snap approached the N-1 limit of 100 MVA. At the current System Peak growth rate, N-1 will likely be violated before 2030.

OPALCO Climate Action: A Way Forward

State Goal
50% GHG Pollution
Reduction by 2030

feasibility studies

Tidal and Emerging Energy Innovations

6¢ per kWh

Utility-scale Solar Microgrids

- Supply all new load by 2035
- Co-op/farmer collaboration
- Works during outages

15¢ per kWh + cost shift

Rooftop Solar: residential, commercial, parking lots, etc.

- At capacity in the mid-2030s
- Supplies about 5% of 2035 load
- Doesn't work during outages
- Cost shifts to non-solar members
- Increasing inverter noise

4¢ per kWh - \$20+ million funding since 2008

Continuous Energy Efficiency and Conservation Programs

4.4¢ per kWh

BPA Hydro: load growing 33% by 2035, no new hydro, decreasing snowpack

2000

2010

2020

2030

2040

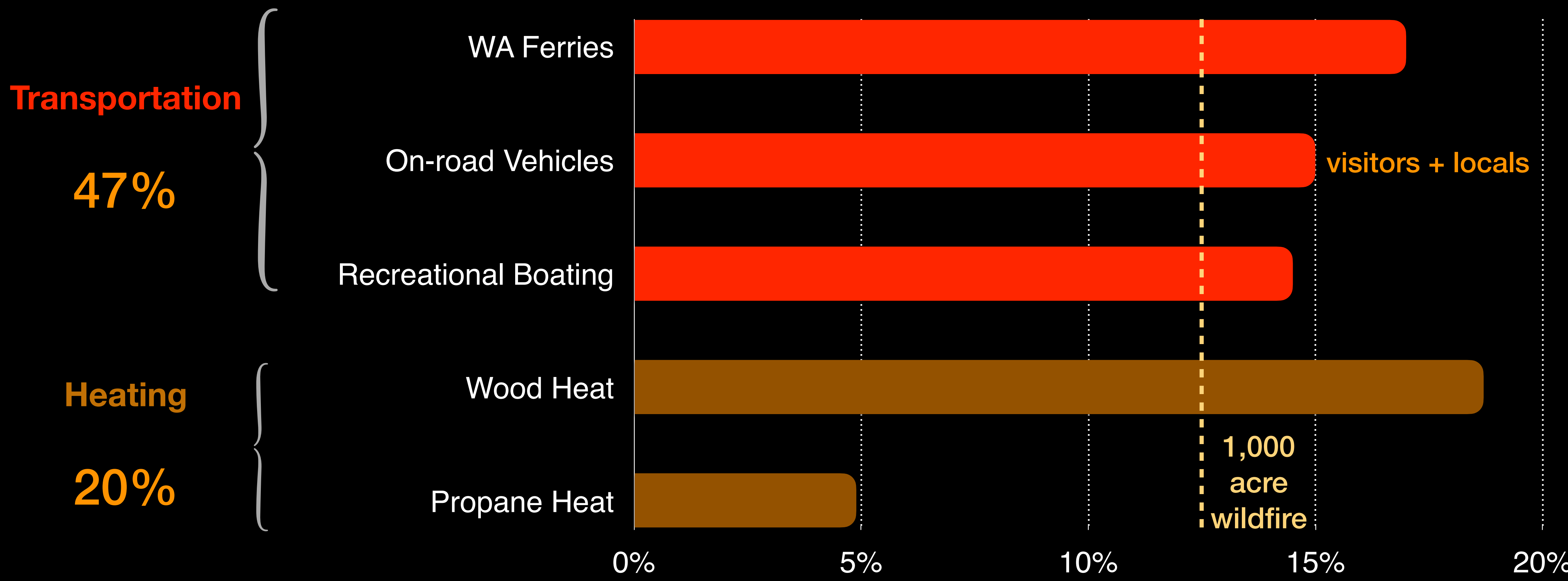
2050

San Juan County Carbon Footprint: 218,655 Metric Tons per Year

Major Sources

Share of Total CO₂ Emissions

source: SJC Community and County Operations GHG Emissions, 2023



= 67% of total CO₂ emissions

OPALCO Climate Action: Leadership in Funding Energy Efficiency and Local Generation

OPALCO has achieved California levels of energy efficiency and rooftop solar generation

Switch It Up

OPALCO can utilize \$46.8M in Rural Energy Savings Program (RESP) funds to provide on-bill financing for co-op members for energy efficiency measures. OPALCO is reimbursed for the funds once member measures are installed. There are now 1,032 projects completed and billing for a total of \$20.9M net outstanding (total projects less member pay-offs). There are another 100+ projects in various stages of the process. Current project details are as follows:

	Project Origination Year							
Measure	2019	2020	2021	2022	2023	2024	2025	Grand Total
Appliance					36,112	51,093	3,249	\$ 90,453
Energy Storage				39,510	27,159	47,766	17,379	\$ 131,813
Ductless Heat Pump	648,252	620,060	637,599	1,532,528	1,788,412	2,356,198	1,308,462	\$ 8,891,510
EV Charger						34,031	2,948	\$ 36,979
Fiber		30,725	48,681	29,301	41,929	85,080	4,492	\$ 240,207
Ducted Heat Pump	8,119	30,000	15,000	18,127	914,187	475,807	271,603	\$ 1,732,843
Heat Pump Water Heater	13,985	9,805		5,012	15,701	13,700	58,885	\$ 117,087
Insulation				256,935	42,634	240,729	680,235	\$ 1,220,533
Other	14,543			92,649	188,075	31,981		\$ 327,249
Solar + Storage				480,057	474,806	710,262	539,346	\$ 2,204,470
Solar				1,896,999	3,116,225	2,394,941	867,961	\$ 8,276,126
Windows				563,557	424,438	508,527	822,386	\$ 2,318,908
Grand Total	\$ 684,900	\$ 690,589	\$ 701,280	\$ 4,914,674	\$ 7,069,677	\$ 6,950,113	\$ 4,576,946	\$ 25,588,180

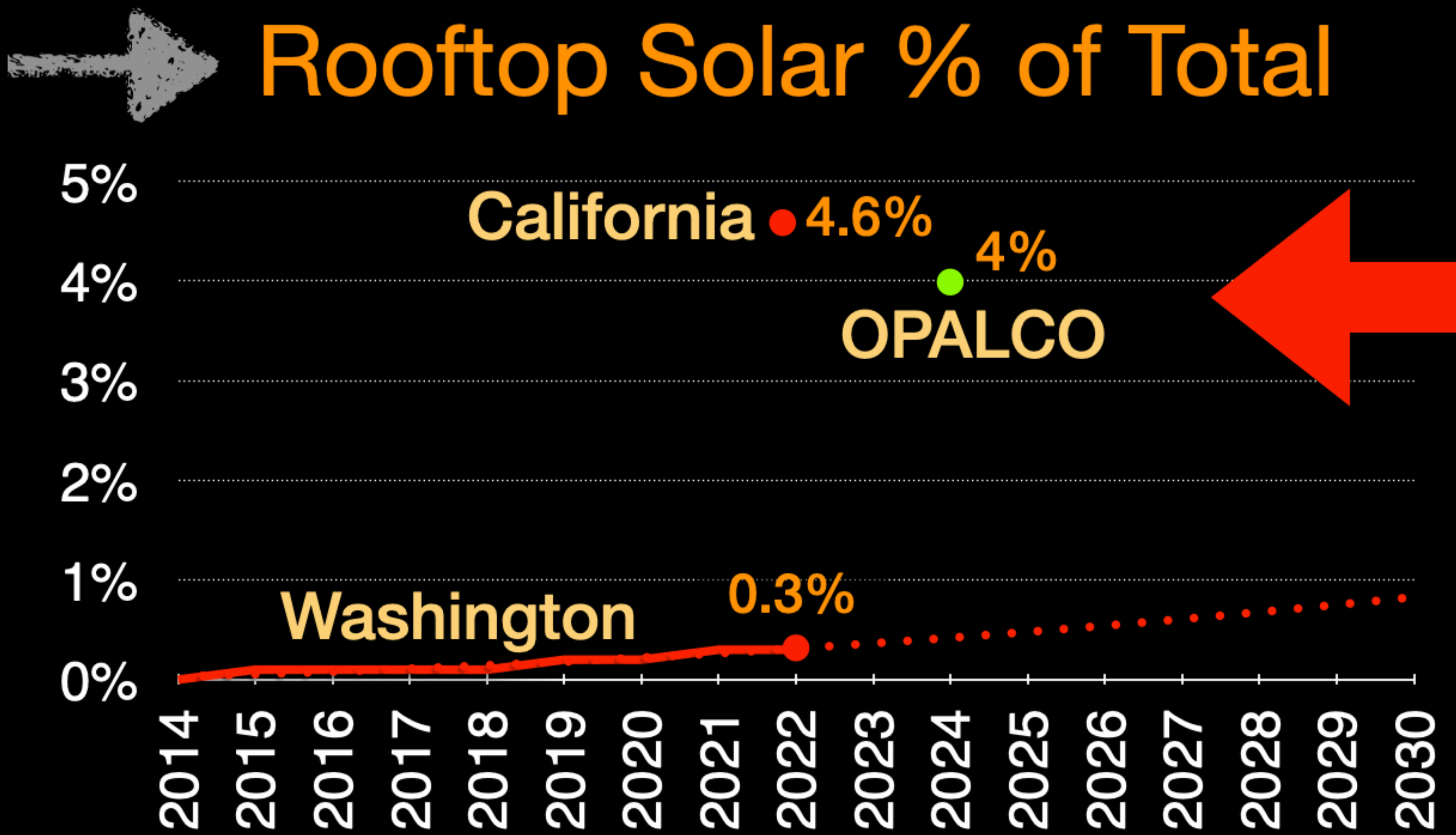
partial

\$10.6M

available for home, commercial,
parking lots, etc.

\$10.5M

OPALCO rooftop solar incentive programs have sparked California levels of production, well above Washington state averages



OPALCO: Community Leadership in Local Energy and Climate Action

	OPALCO	Gasoline	Propane
Energy Business	Nonprofit	For Profit	For Profit
Investment in Community	✓	✗	✗
Energy Efficiency and Conservation Programs	✓ \$20+ million	✗ \$0	✗ \$0
Low-income Programs	✓ \$1.8+ million	✗ \$0	✗ \$0
Investing in Local Energy	✓	✗	✗
Investing in Climate Action	✓	✗ in denial	✗ in denial
Mitigating Wildfire Risk	✓	✗ making it worse	✗ making it worse

Energy and Climate: What problems are we trying to solve?

Business as Usual = Climate Disaster. Time is of the essence. Climate change is progressing faster than the pace of bureaucracy. Streamlined permitting helps reduce fossil fuel burning and protect rural character.

Problems/Challenges	Solutions=>			Sectional	Fossil
	Solar	Storage	Tidal	Grid	Generation
35% county load growth population growth, transportation, heating	✓✓	✓✓	✓✓		✓
mainland energy prices extremes extreme winter and summer weather events	✓	✓✓	✓✓		✓
mainland energy outages projected imminent during extreme w	✓	✓✓	✓	✓✓	✓
exceeding submarine cable capacity projected in early 2030s	✓	✓✓	✓	✓✓	✓
the winter problem load doubles, minimal rooftop solar generation	✓	✓	✓✓		✓
reduce county GHG pollution & ocean acidification 67% comes from transportation and heating	✓	✓	✓		✗
affordable farming and worker housing agrisolar + farm and worker housing	✓	✓			

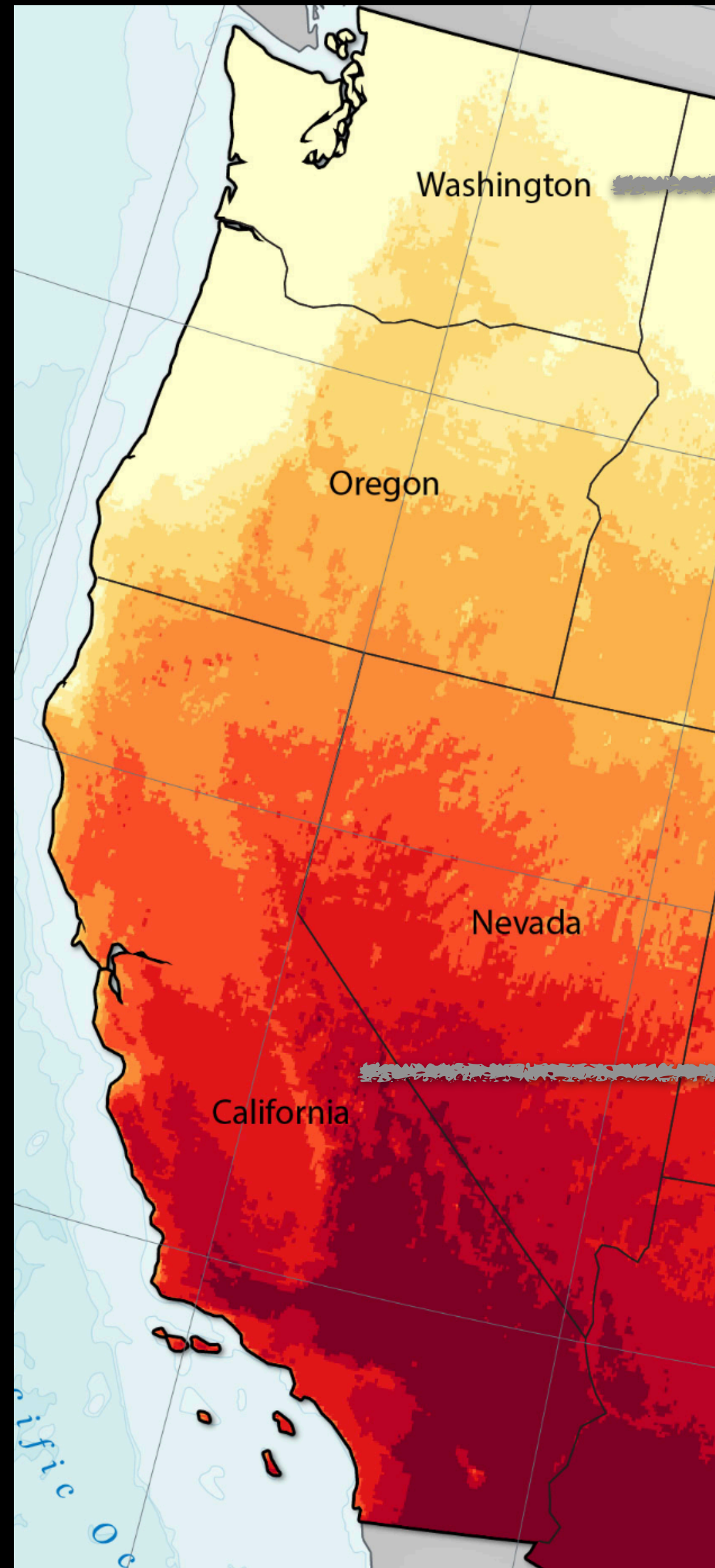
The Three Pillars of Washington Energy Policy

Rooftop Solar is a small fraction of what's needed, more expensive, with more cost-shifting

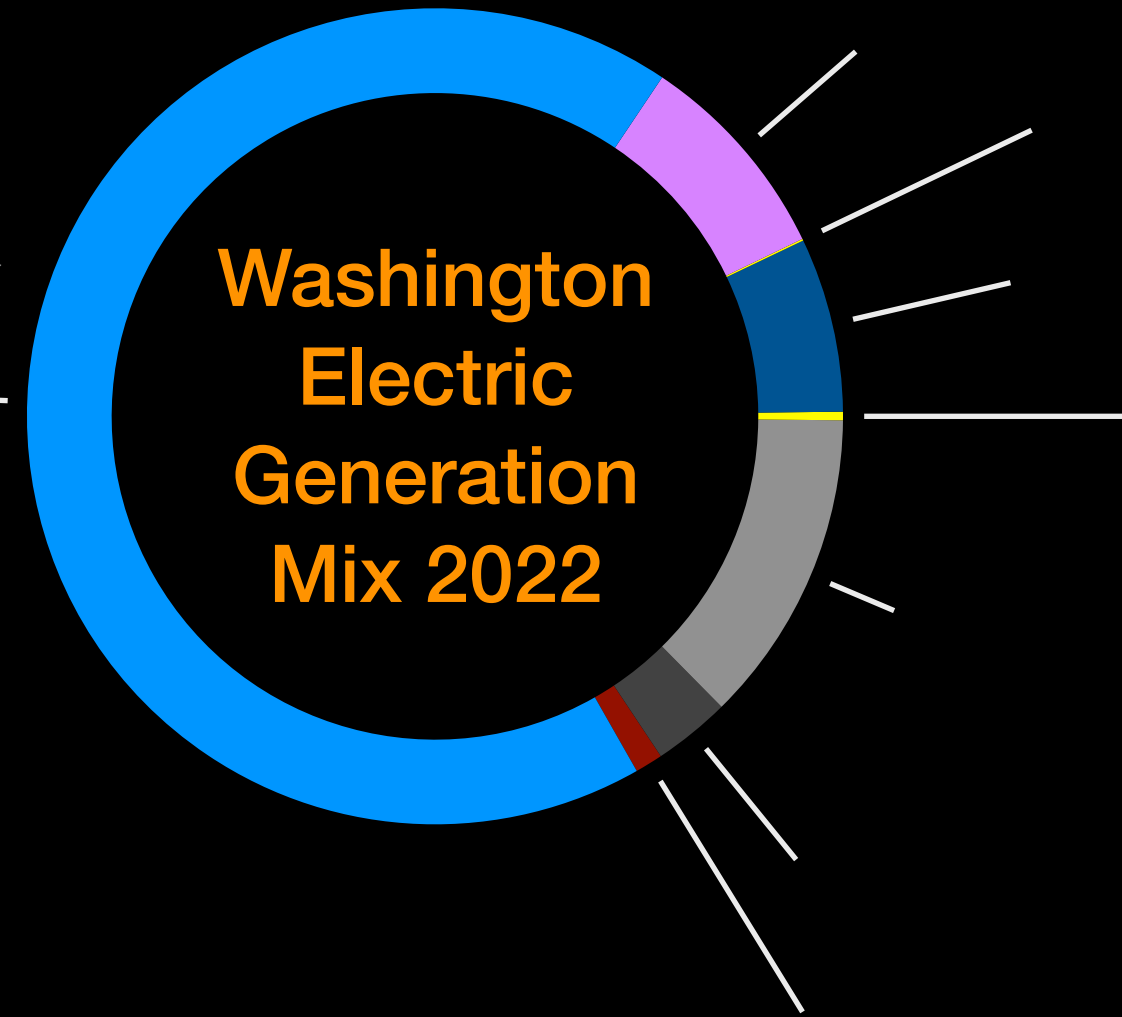
- ✓ **Net-zero GHG emissions by 2050** (50% reduction by 2030)
 - 5 years left to achieve 50% reduction
- ✓ **Energy Resilience**
 - Rooftop doesn't work during outages
 - Utility-scale solar + storage does, directed to critical services via sectionalized grid
 - Utility solar are tilting arrays to maximize winter production
 - Only 1,500 to 1,700 potential roofs (see appendix)
 - Only 3.5 MW of commercial rooftop and parking area
- ✓ **Equitable**
 - Rooftop costs 6X more than utility-scale solar (capital and power cost)
 - Rooftop solar cost-shifts operational costs to those who can't afford solar

The Winter Problem: Northwest is not the Southwest – NW winter solar production is less than one-third of the SW

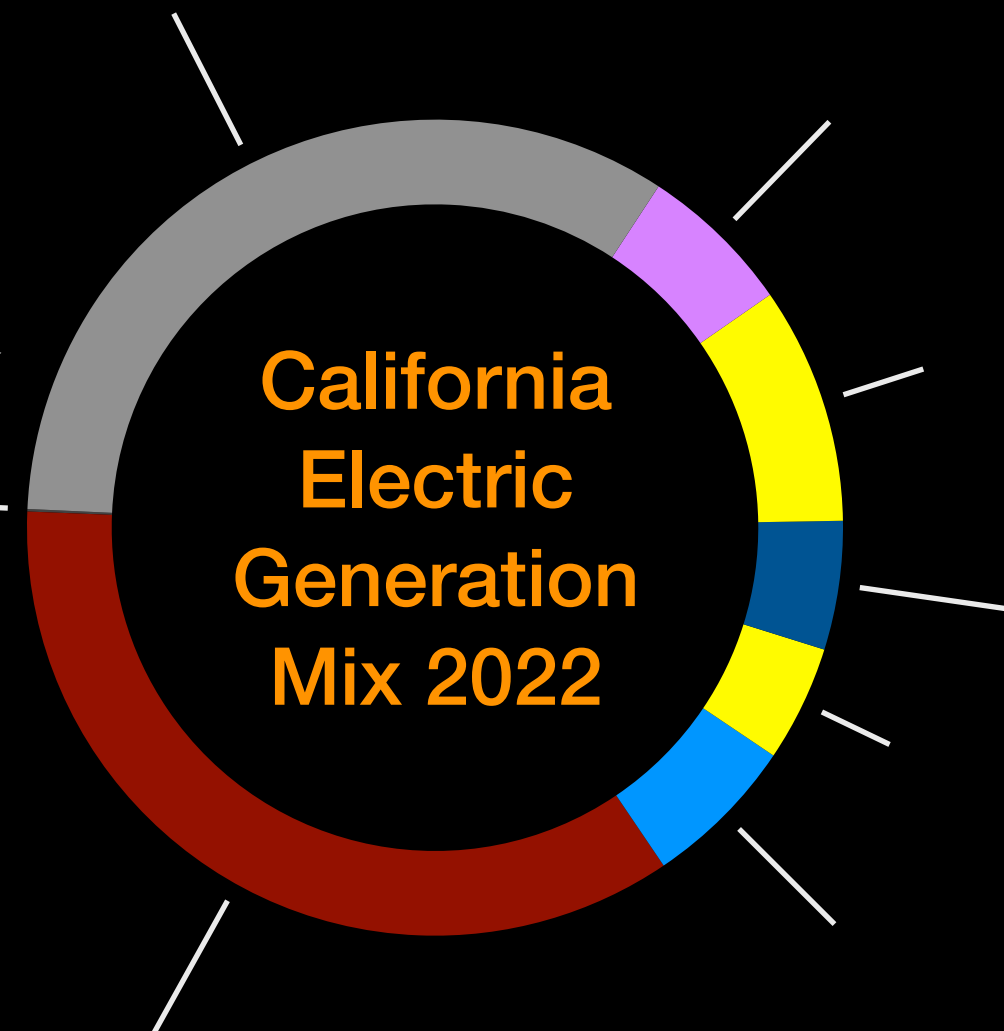
Annual Solar Irradiance



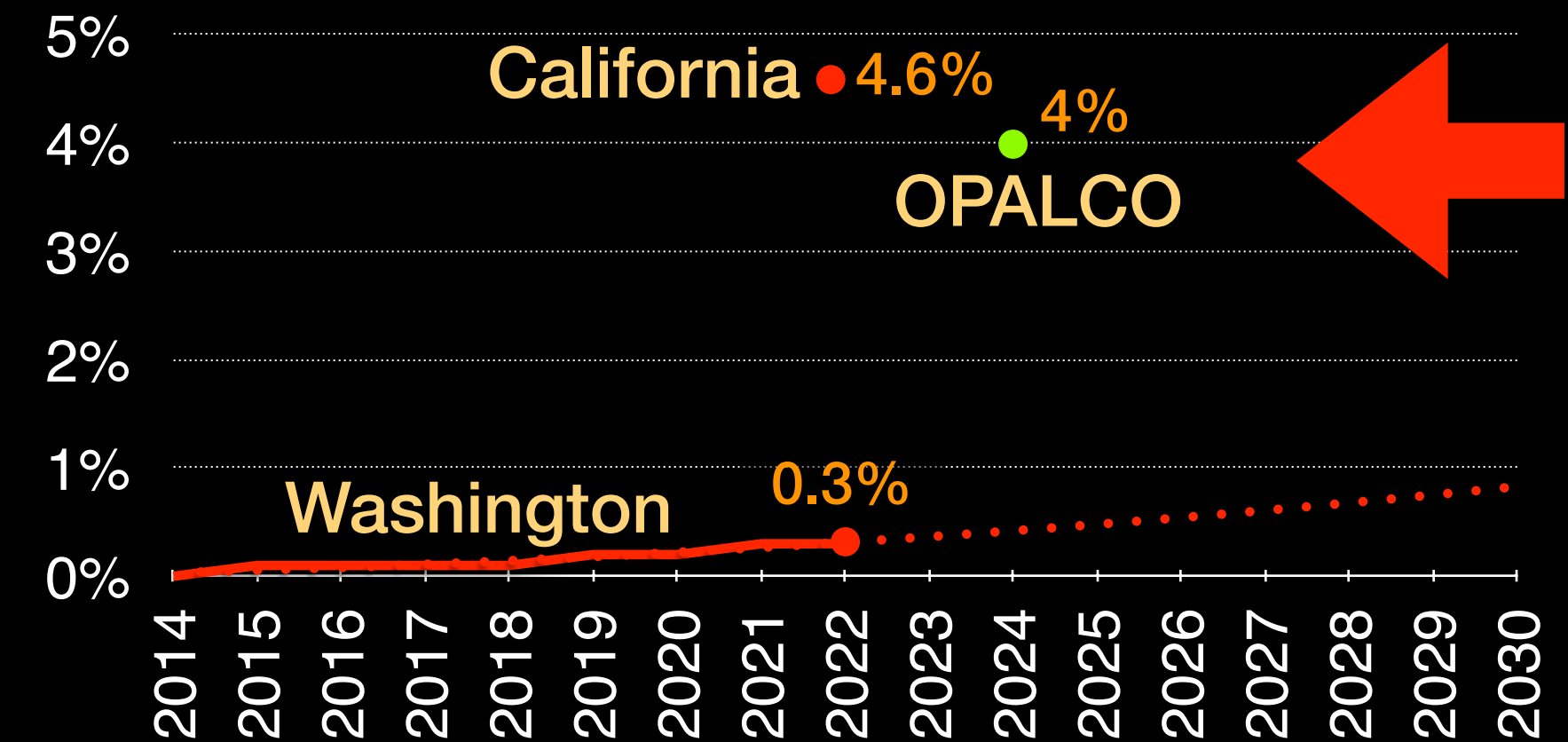
Washington Electric Generation Mix 2022



California Electric Generation Mix 2022



Rooftop Solar % of Total



Notes

- In California, rooftop solar is only 4.6% of the total state energy portfolio.
- In Washington, where solar irradiance is a small fraction of California, rooftop solar contributes only 0.3%, and is projected to be less than 1% by 2030.
- December production is 72% less than California.
- Washington solar capacity factor is about one-third of California's.
- California utility-scale solar production is double rooftop. In Washington, it's one-third of rooftop. WA policy should incentivize utility-scale solar, which is more capital and production-efficient.

Agrisolar



Pollinator Crops

©Joanna Kulesza/Courtesy The Nature Conservancy



Grazing improves soil fertility



Food Production Shade-loving Crops

Agrisolar Helps San Juan County Farmers

Farming in the San Juans is not economic.

The average farmer loses \$51 per acre per year.
A Power Purchase agreement for \$6 per MWh
would produce \$10,000 per acre annually.

Many farmers support utility-scale agrisolar.

No Rural Farm Forest trees to cut.

Helps shade-loving crops in a warming world.

Supports grazing and increased land fertility.

Can be located on poor soil land.



Agri-Solar = Dual-Use Food + Energy Production: Two Approaches

Utility Ownership

- Produces 10X all current rooftop kWh, at 6X less cost
- Much faster to deploy at scale
- Works during outages
- Tracks the sun to maximize production, especially in winter
- Partner with farmers for grazing, pollinators, shade-loving crops
- Improved land fertility and value per acre versus haying

Farmer Ownership

- Farmer sells to OPALCO through a Power Purchase Agreement (PPA)
- Switch It Up Funding and grant-funded joint-projects
- The average farmer loses \$51 per acre per year.
- A PPA for \$6 per MWh would produce \$10,000 per acre per year.

*Powers the county through three seasons + critical services in winter
using just .5% of land*

Agrisolar: Farming the Sun

- A harmonious blend of agriculture and solar energy production that enhances the land, boosts farming economics, and increases local renewable energy generation.
- New Jersey has implemented a climate-friendly land-use policy that allows up to 5% of farmland to host agrisolar arrays. [Click Here to Learn More](#)
- To put that in perspective, OPALCO's local energy plan would use less than 3% of county ag land.
- Working in collaboration with farmers, agrisolar would improve farming economics, helping farmers access farmland that would otherwise be too expensive.
- According the the 2022 USDA Census of Agriculture, the average San Juan County farmer loses \$51 per acre. Agrisolar can help farm the sun to produce local energy and income for farmers, improve soil health and productivity. [Click Here to Learn More](#)
- 30% to 50% of designated Agricultural Resource Land (ARL) in San Juan County, WA may have marginal or non-qualifying soils due to factors like rocky terrain, poor drainage, or steep slopes

Agri-Solar = Dual-Use Food + Energy Production



News: Small US State Launches Game-Changing Agrivoltaic Project

DOE recognizes the enormous opportunity for agrivoltaics to combine agriculture with clean energy production, while increasing revenue for farmers and landowners,”

Dr. Becca Jones-Albertus

Director, U.S. DOE Solar Energy Technologies Office.



“We found increases over time for all habitat and biodiversity metrics: floral rank, flowering plant species richness, insect group diversity, native bee abundance, and total insect abundance, with the most noticeable temporal increases in native bee abundance,” the research team concluded. Overall, they assessed that insect communities responded to the habitat restoration project at the relatively rapid pace of less than four years.

In another key finding, the researchers found that bee visitations from the solar array to a nearby soybean field were comparable to the visitations from a nearby farmland preserved under the US Department of Agriculture’s Conservation Reserve Program.

San Juan County Agri-Solar Economics

	Acres	% Total	\$/ACRE	500 acres
Cropland	7,928	40.5%		6.3%
Pastureland	6,255	32.0%		8.0%
Woodland	3,954	20.2%		12.6%
Other	1,434	7.3%		
Total	19,571	100.0%		2.6%
Crops	\$5,734,000		\$723	\$/ACRE CROPLAND
Livestock	\$4,909,000		\$785	\$/ACRE PASTURELAND
Total	\$10,643,000		\$544	\$/ACRE TOTAL
Gov't Payments	\$72,000			
Farm Related	\$747,000			
Total Income	\$11,462,000		\$585.66	\$/ACRE/year TOTAL
Total Expenses	\$12,453,000		-\$636.30	\$/ACRE/year TOTAL
NET INCOME	-\$991,000			

If Agrivoltaics adopted:

1MW	6 acres
1,000MWh/yr	
\$42/MWh	\$42,000/yr
	+\$7,000/acre/yr

Community agri-solar is more efficient, cost-effective, and equitable



WASHINGTON STATE UNIVERSITY
Energy Program

The Washington State University (WSU) Energy Program delivers program management, on-site assessments, analytical tools, and training to meet evolving energy challenges in the State of Washington, the Pacific Northwest, the United States, and internationally.

Partnering with a wide range of agencies, organizations, institutions, and businesses, our energy experts identify energy challenges and develop solutions.

Our customers include large and small businesses, public and private utilities, manufacturing plants, local and state governments, federal agencies and facilities, schools and universities, national laboratories, tribes, professional and trade associations, and consumers.

Our staff of energy engineers, energy specialists, technical experts, and software developers work out of Olympia, Washington. The WSU Energy Program is a self-supported department within the University.

We are part of the College of Agricultural, Human and Natural Resource Sciences (CAHNRS). Our Director reports to the Associate Dean of the College/ Director of WSU Extension.

Contact
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WSUEEP23-05 • June 2023



Photo by Lexie Haln, Lightsource bp; courtesy of the U.S. Department of Energy.

Dual-Use Solar Opportunities for Washington State

Executive Summary

To meet Washington state's directive to replace its fossil-fuel generated energy sources with renewable and non-emitting energy sources by 2045, clean energy such as solar will need to be developed. Solar photovoltaic (PV) installations require five to ten acres per one megawatt (MW) of generated electricity, which can create conflict with other land uses. Across the country and the world, land use conflicts are eased when solar PV is co-located with agricultural operations, often called dual-use solar, allowing food production and ecosystem services to continue on the same site where electricity is generated.

Currently, Washington state lags far behind many other states in dual-use solar applications and research. This report, written by Washington State University (WSU) Energy Program as mandated by the Washington State Legislature, provides information such as dual-use solar research, benefits, considerations, policies, and incentives. The intent of this report is to increase the opportunities and practice of dual use in Washington.

Benefits and challenges

Dual-use solar provides numerous economic and environmental benefits, including improved economics for farmers and other agricultural producers, ecosystem services such as maintaining soil health, and expanded siting opportunities for solar development. Farmers benefit by keeping their land in production, and developers may see some soft costs (non-hardware) reduced.

Below are many of the benefits derived from various dual-use activities. More specific information is under the individual activities in the next section.

Dual-Use Agri-solar Benefits

- Improved farm economics from solar energy sales
- Increase access to ag land that would otherwise be unaffordable
- Reduce climate impacts, including:
 - Reduce soil evaporation and plant transpiration
 - Shade cooling - grazing, bees, sun-sensitive crops, broccoli, etc.
 - Pollinator habitat diversity - safeguards soil health, improves stormwater retention, reduces wind and soil erosion

County Permitting Challenges and Opportunities

Bailer Hill is the Flagship of Future County Climate Action

Bailer Hill Micro-grid public support is running about 8 to 1 in favor, especially with farmers.

- Partner with farmers for grazing, pollinators, shade-loving crops
Agri-Solar Dual-Use = Food + Energy Production
Improved land fertility and value per acre versus haying
- Doubles local energy production, including all rooftop solar since 2008
Much faster to deploy at scale
- Sun-tracking arrays improve winter solar production when it is needed most

Why Bailer Hill?

- Needed to be an ag site, close to our substation, for sale, can't be a "jewel of the San Juans"
- 65% of County land use acres are "NO"
- 35% is arduous Conditional Use Permit
- Grants decision-making required OPALCO ownership
- Prefer not needing to remove trees
- Poor soil conditions, evaporation, and pollinator profile, that could be improved with agri-solar
- No warning signs in pre-development vetting process
- Reasonable sale price for membership

Bailer Hill Microgrid Permitting Frustration

- The broadband crisis was an example of the success of OPALCO/County collaboration.
- It worked because we had mutual trust and commitment to quickly solving large problems, with environmental care.
- Bailer Hill project has been a bureaucratic nightmare. Rather than continue to struggle with project delays and special interest permitting opposition, OPALCO has decided to pause our permitting efforts on Bailer Hill.
- In the coming months, OPALCO will be checking in with our membership (via a membership survey) to determine if we have the support from the majority of our members to continue permitting/building local renewable energy projects in San Juan County.

Bailer Hill Microgrid Permitting Frustration

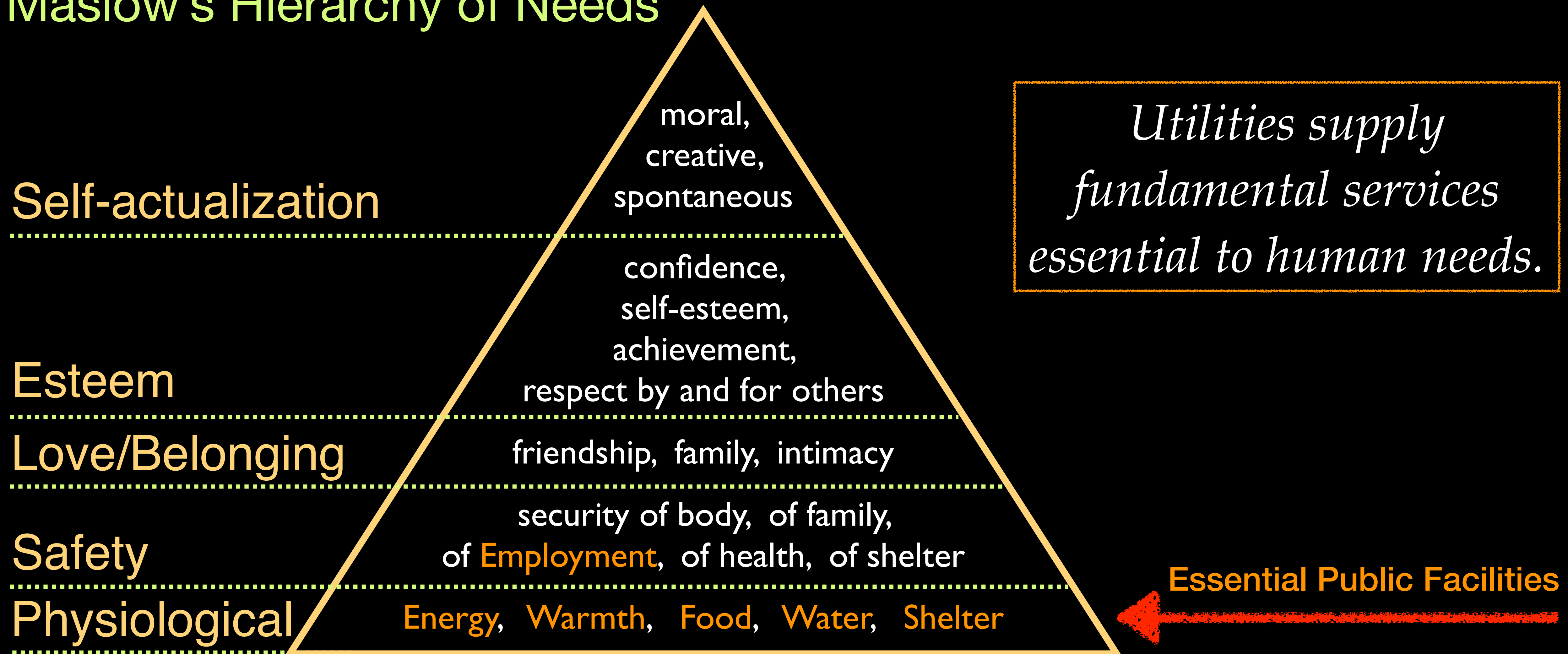
- About 2 years of delay, much of it arbitrary, costing the co-op over \$300,000.
- SJC's latest permitting delay will require us to provide additional information that will take 9 to 12 months to complete.
- This request will put us past the deadline schedule for the Low-Income Solar Grant that we tentatively received from the WA Department of Commerce.
- OPALCO is working with the WA Department of Commerce to see if we can obtain another schedule extension and develop alternative site locations, and in discussions with Council about extending Decatur Island Micro-grid.

GMA and Local Renewable Energy

- OPALCO has been attempting to obtain a permit to build it's second micro-grid project on our Bailer Hill site.
- Following Growth Management Act (GMA) protocols is unfairly limiting OPALCO's ability to provide essential electrical services to San Juan County.
- Normally larger cities and counties opt-in to GMA provisions where the city/county directly controls both providing essential services as well as permitting.
- In the case of OPALCO, we provide essential power, however, SJC independently controls restrictive land-use and permitting protocols.
- SJC's existing land-use tables have not been updated for decades and remain overly restrictive of non-carbon emitting and passive generation

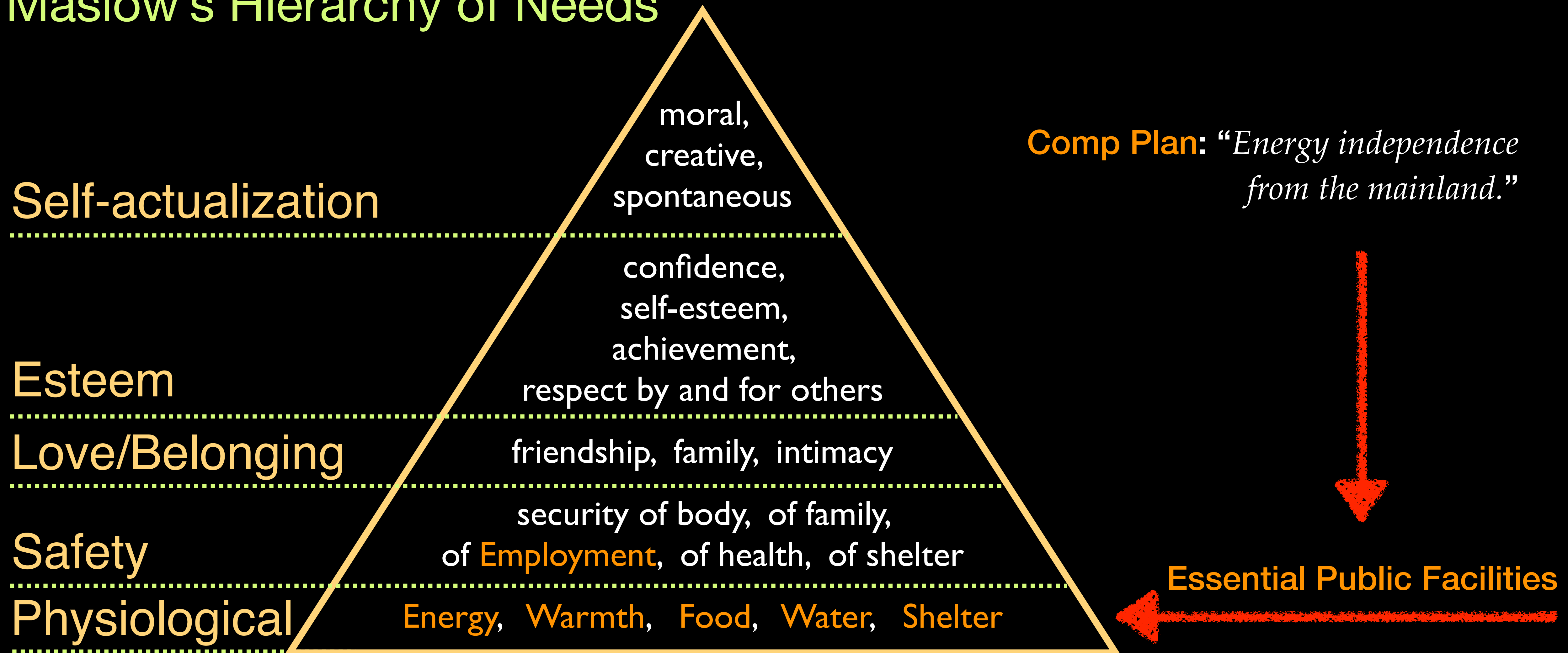
Utility Duty To Serve: Essential Public Facilities

Maslow's Hierarchy of Needs



Utility Duty To Serve: Essential Public Facilities

Maslow's Hierarchy of Needs



Climate Action Protects

Rural Character

Risk

Climate Change Is Destroying Nature.

Need to reduce CO2 50% by 2030.

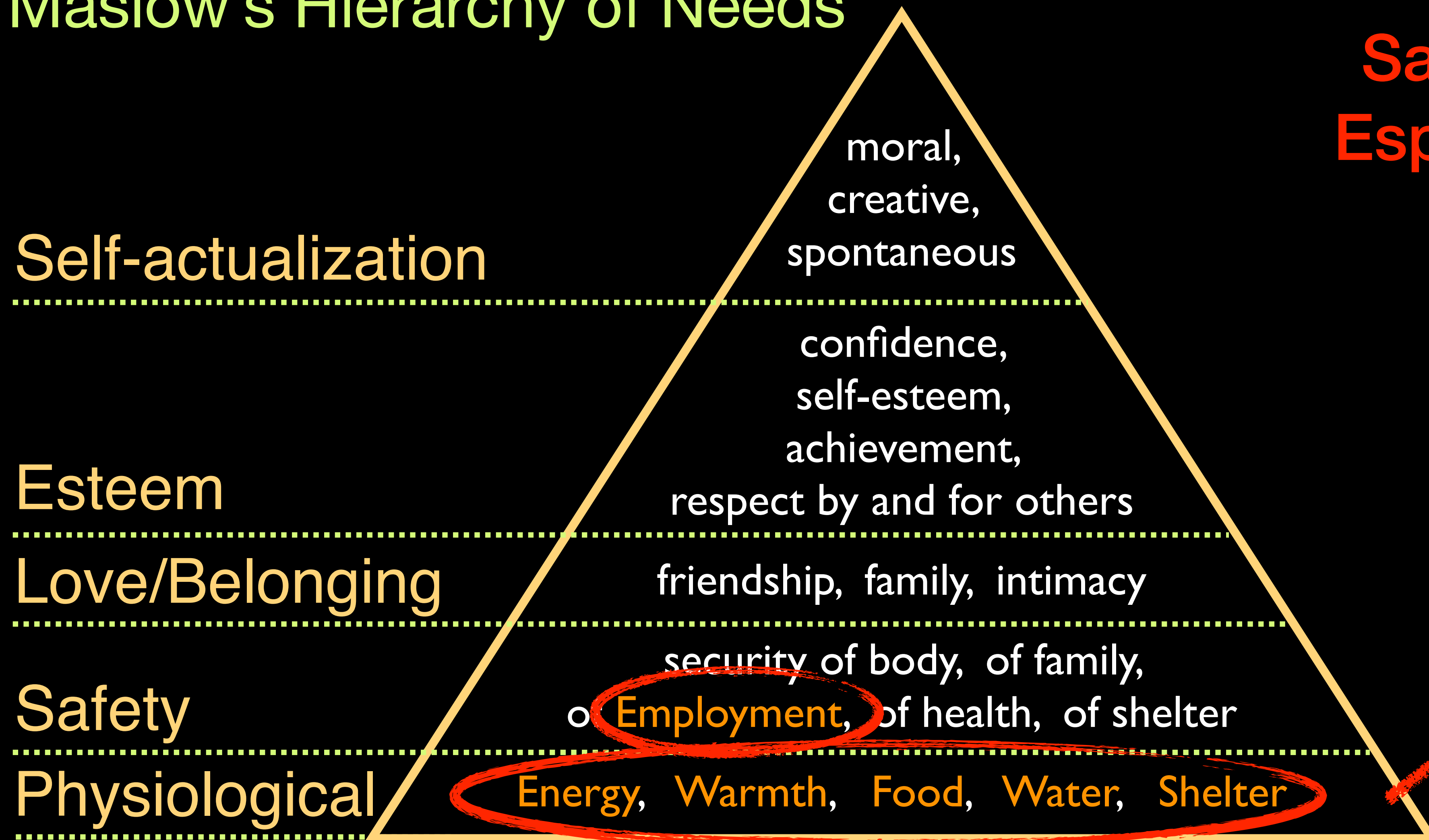
Mainland power outages and price shocks are imminent.

Rooftop solar is not a silver bullet.

utility-scale solar will help

A Climate Crisis At Our Doorstep

Maslow's Hierarchy of Needs

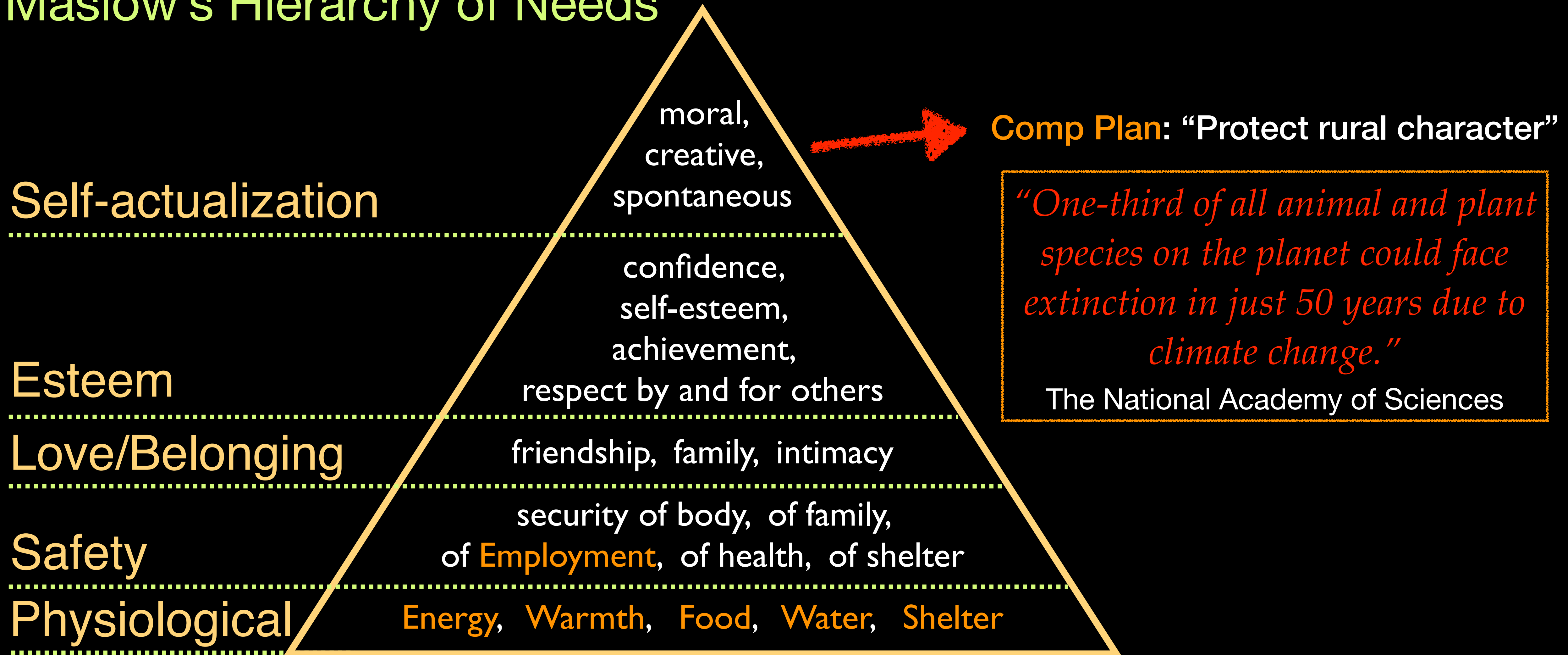


San Juan County is Especially Vulnerable

heat domes
drought
extreme wind
wildfires
water shortages
extreme rain & wind
flooding
sea level rise
climate migrants
ocean acidification
ocean warming

*Climate disruption will not preserve rural character.
It will destroy it.*

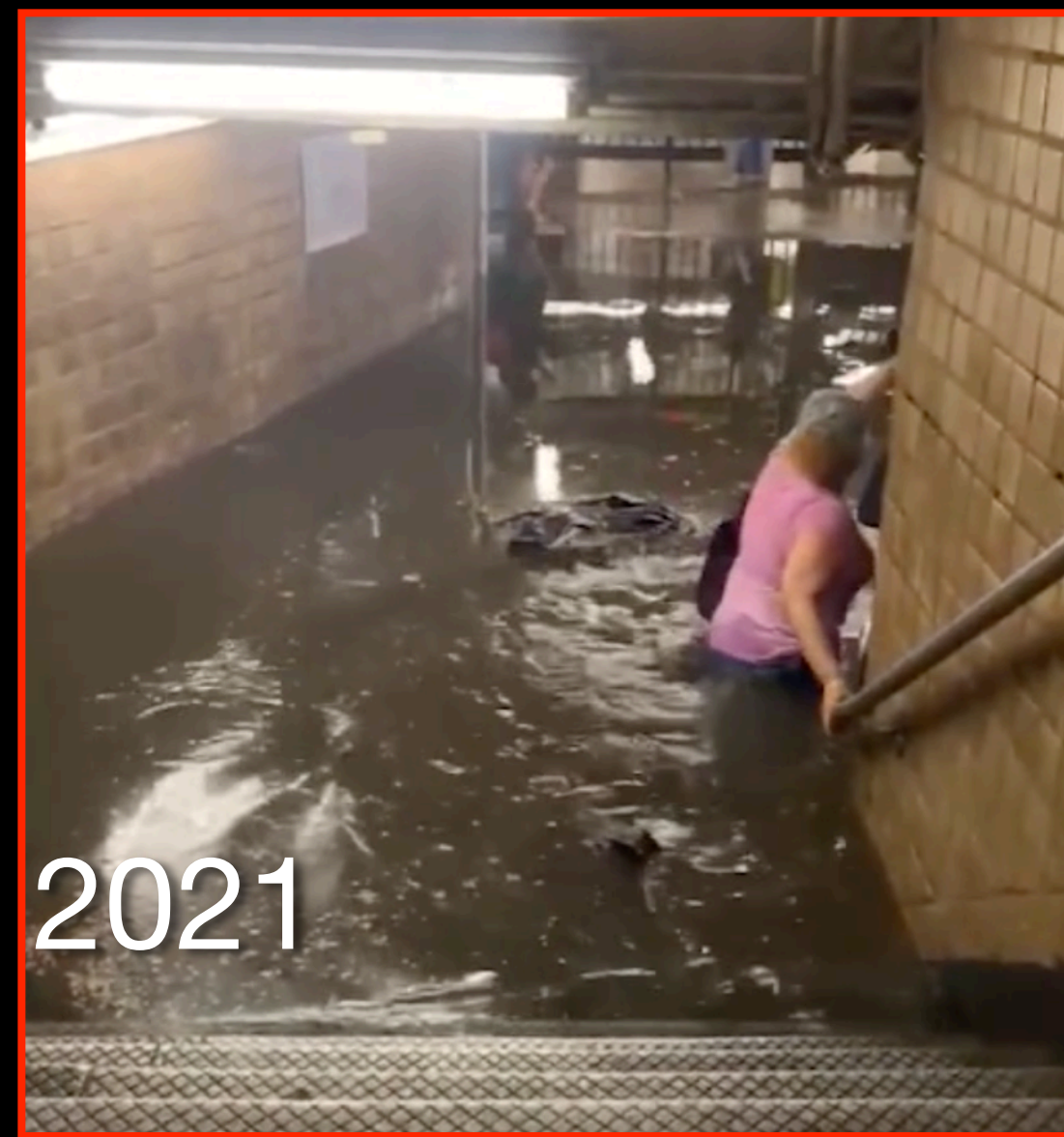
Maslow's Hierarchy of Needs



Extreme Weather: Rain

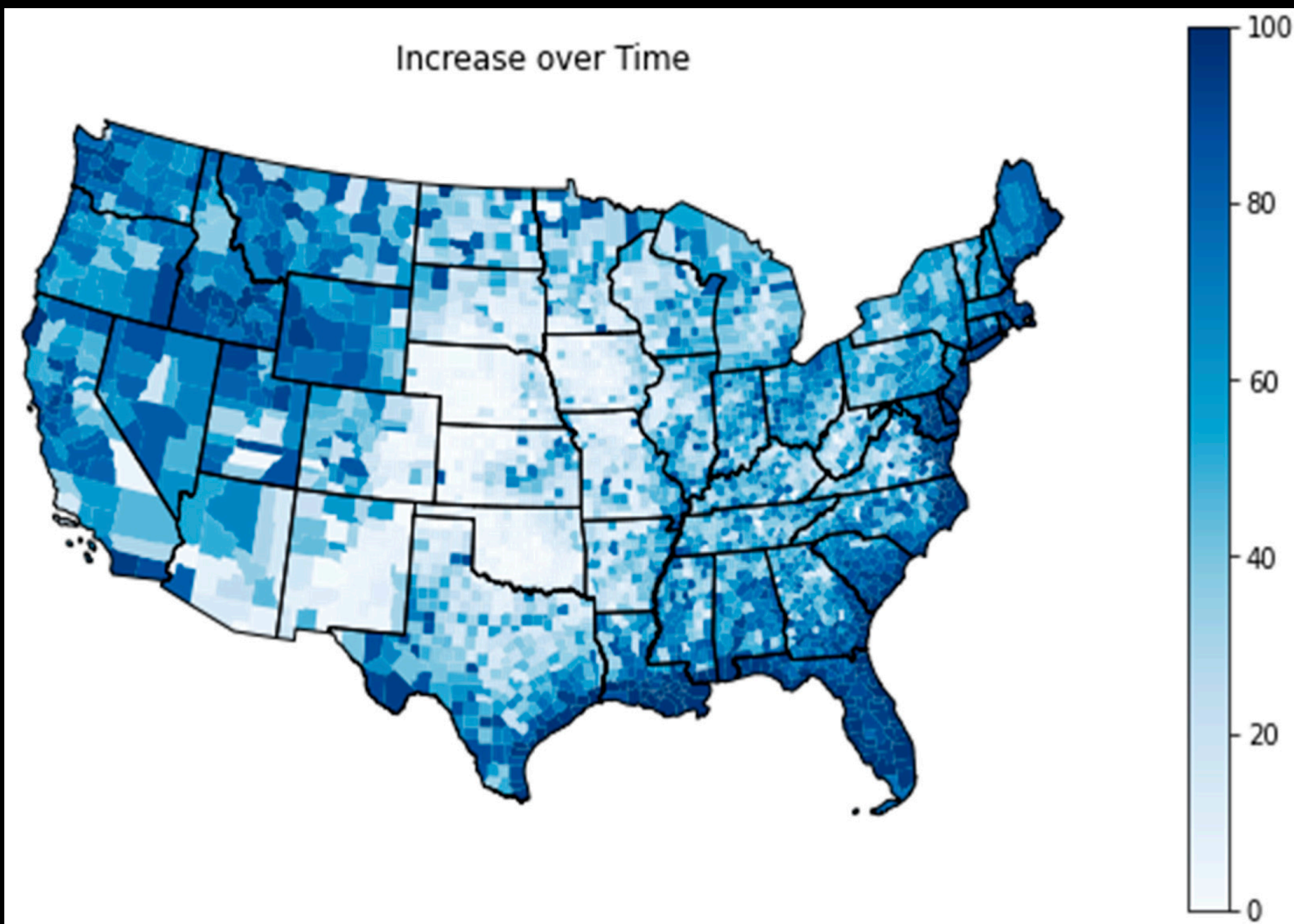


Extreme Weather: Rain



Infrastructure With Operational Risk

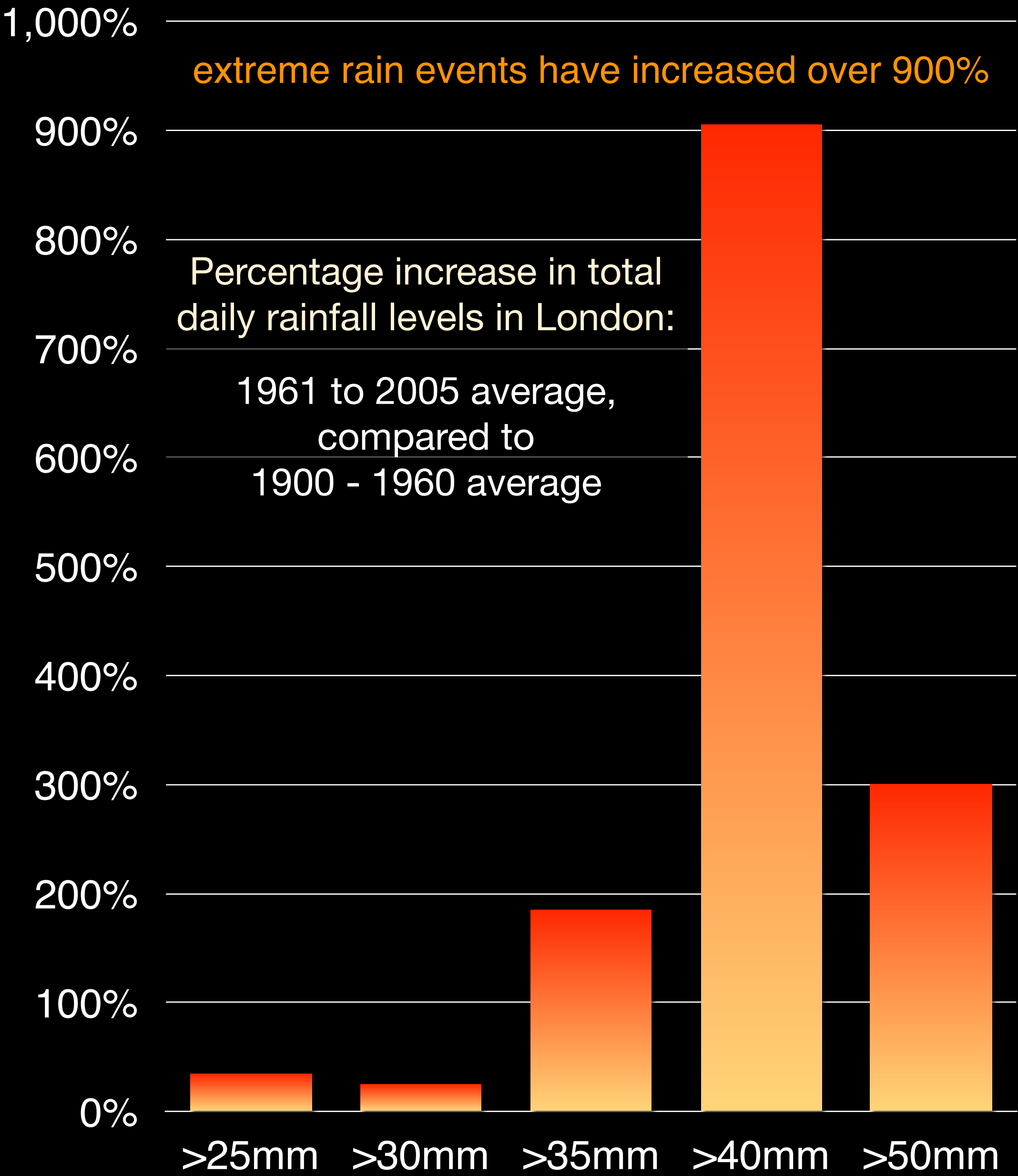
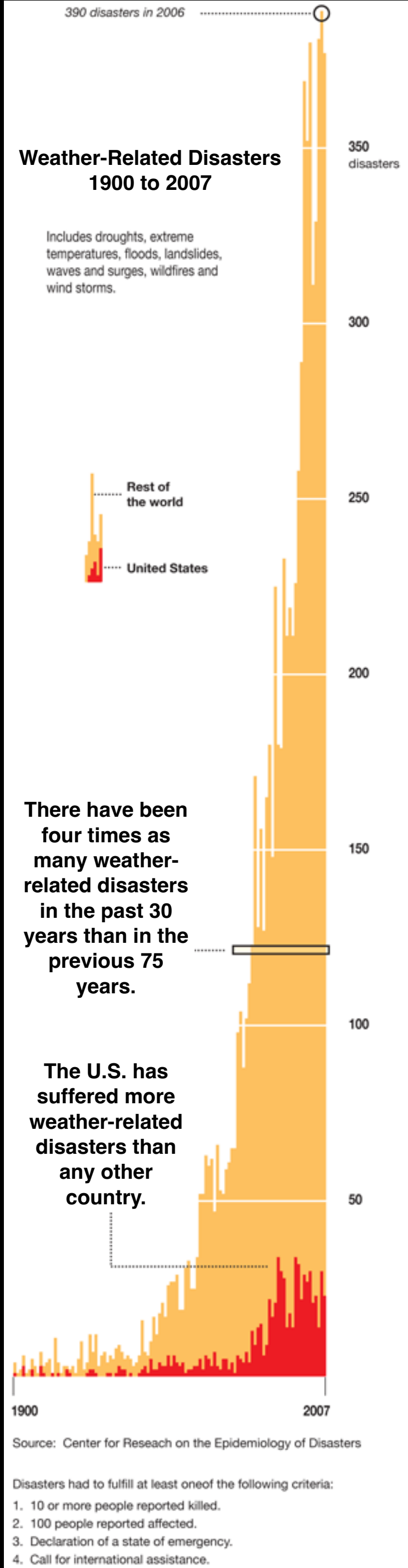
change in percent from 2021 to 2051 by county



**San Juan County is
Especially Vulnerable**

“As climate-fueled disasters get worse, home insurance is becoming a money-losing business in more of the country. Without insurance, you can’t get a mortgage; without a mortgage, can’t buy a home.”

Extreme Weather Events Are Increasing



The developed areas of Puget Sound and the transportation, drinking water, wastewater, and energy systems that serve the region's population will face an increasing risk of a variety of extreme weather events (e.g., heat waves, wind, flooding, wildfire). Consequences include flooding of low-lying infrastructure, damage to energy transmission, and higher maintenance costs for many transportation and other elements of the built environment.

UW Climate Impacts Group

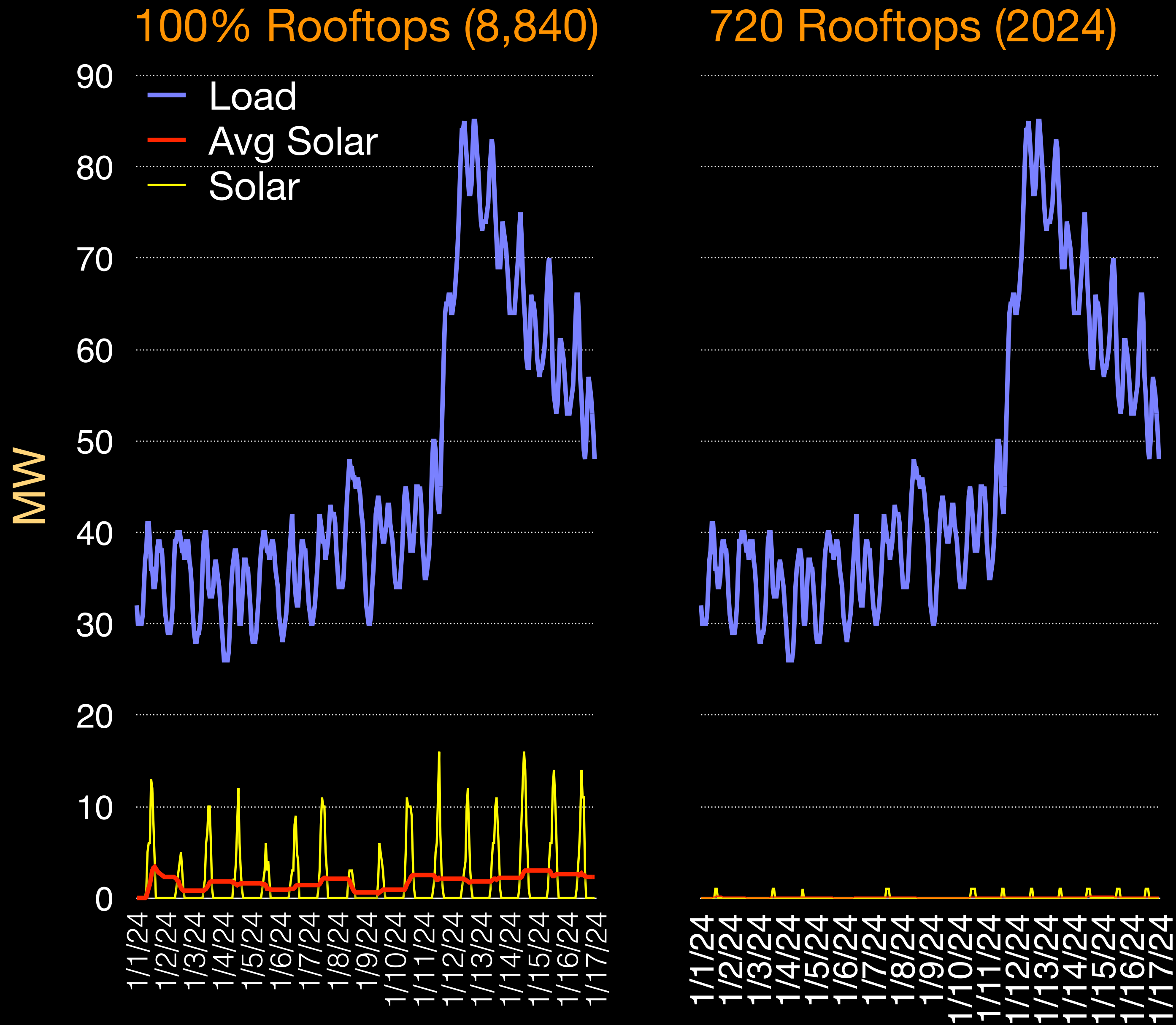
Source: Lloyd's emerging risks team, Center on the Epidemiology of Disasters

Rooftop Solar + Efficiency

A good start, ...

how microgrids fill the gaps

Cold Snap Load: 86 MW peak load, and member rooftop solar production



Notes

- Nor'easter began on 12 January, with near 0° F temperatures
- Load and member solar production around the January 2024 cold snap
- Solar production for **100%** of OPALCO member 10 kW rooftops (8,840 roofs), and 720 members with 7kW rooftops in 2024
- Solar production 24-hour smoothing to represent battery firming
- \$300 million cost for 100% rooftop example

Of the county's 109,000 acres, we only need 540 acres (0.5%) to produce 35% of our energy use.

Local Solar Potential on Rooftops is Less than you Think

OPALCO member rooftop solar is an important part of the solution, where it makes sense.



- ❖ Generation can be degraded due to tree shade and poor roof orientation to the sun
- ❖ Sunny portions of rooftops are a small percentage of rooftop surface area, rooftops are a small percentage of land
- ❖ Rooftop solar inverters provide lower-quality power, requiring grid systems to maintain power quality as # of rooftops increases.

Yellow dots correspond to sunny portions of roof

OPALCO Climate Action Programs: Switch It Up, Rebates, Fuel-switching

Two decades of classic energy efficiency measures (insulation, windows, weatherization, etc) have helped reduce load-per-meter. Now, fuel-switching offers next-level **TOTAL** energy efficiency improvements.

BPA Rebates	2017	2018	2019	2020	2021	2022	2023	2024 partial	Total
Ductless HP	55	79	98	88	78	96	102	30	626
HP Water Heater	14	20	16	28	24	20	16	4	142
Switch It Up Program									
Ductless HP				144	62	87	111	58	462
Ducted HP				3	1	1	33	11	49
			HP fuel-switch share=>			21%	15%		
HP Water Heater				7	0	1	1	1	10
Solar						62	95	41	198
Battery						11	9	3	23
OPALCO Fuel-switch Rebates									
EV Charger						7	47	27	81
Ductless HP						8	64	17	89
			HP fuel-switch share=>			100%	100%	100%	

Notes

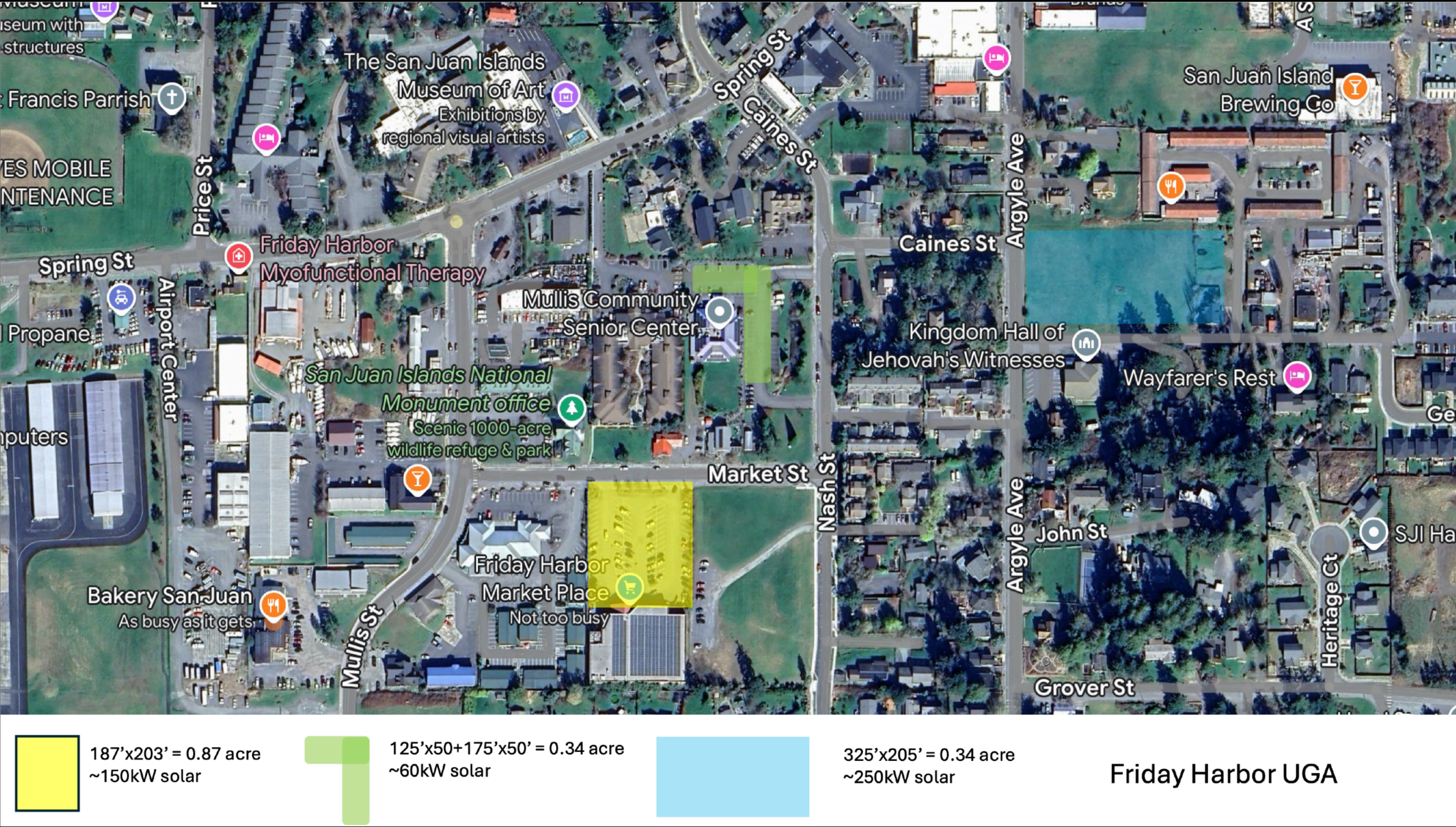
- Rooftop solar installs are accelerating, thanks to Switch It Up (SIU) program started in 2022.
- OPALCO also reduce the renewable energy credit in 2022 to make it more equitable, reducing cost-shifting to those that couldn't afford solar.
- SIU is also reducing CO2 emissions from members who electrify their cars and heating.
- EVs ar 5X more efficient than fossil-fueled cars.
- Heat pumps are 3 X more efficient.

Rooftop vs Utility-Scale Community Solar Potential and Cost Estimates

Rooftops **	total units	% suitable (NREL)*	probability of N+1 (using CA 30yr data ****)			Power & Cost	Units	
						Residential/Commercial Rooftop		
Total Housing Units	13,619	5,714		Mean	95% Confidence	1,562	rooftops	
Owner Occupied	5,507	3,731	20%	746	698-794	10	kW/rooftop	
Renter Occupied	2,201	1,491	1%	15	7-22	1,000	kWh/kW	
Vacant/Vacation Rental	5,911	4,005	20%	801	751-851	15,620	MWh/yr	
				1,562	1,456-1,667	3.15	\$/kW installed ***	
Percentage of Total						\$49,204,333	Installed Cost	
Owner Occupied	40.44%					5%	Distribution Upgrades	
Renter Occupied	16.16%					\$2,460,217	Upgrade Cost	
Vacant	43.40%					\$51,664,550	Total Cost	
						\$2,583,227	\$/yr 20 yr amortization	
Vacant use by type						\$165.38	Power cost/year/MWh	
Seasonal, Recreational, or occasional	4,408							
For sale only	222							
For Rent	214							
Rented or sold, not occupied	111							
For migrant workers	0							
Other vacant	556							
** https://www.sanjuancountywa.gov/DocumentCenter/View/25361/2022-03-11_Page_Staff-Report_HAC-Housing-Element-Feedback								
*** https://www.energy.gov/eere/solar/solar-photovoltaic-system-cost-benchmarks?utm_source=chatgpt.com								
**** https://www.californiadgstats.ca.gov/charts/								
https://www.osti.gov/biblio/1575064								
https://data.nrel.gov/submissions/121								
* Rooftop_PV_Technical_Potential.xlsx			Zip Code			Total Roofs	% Suitable	Suitable Roofs
DEER HARBOR	SAN JUAN	WA	WA_98243	98243	Rural Fringe	163	66.1%	108
EASTSOUND	SAN JUAN	WA	WA_98245	98245	Rural Fringe	2437	66.1%	1610
FRIDAY HARBOR	SAN JUAN	WA	WA_98250	98250	Rural Fringe	3976	68.5%	2724
LOPEZ ISLAND	SAN JUAN	WA	WA_98261	98261	Rural Fringe	1858	68.5%	1272
San Juan County						8,434	67.7%	5,714
Forecasting Potential:								
Spatial distribution of solar PV deployment: an application of the region-based convolutional neural network								
https://epjdatascience.springeropen.com/articles/10.1140/epjds/s13688-023-00399-1?utm_source=chatgpt.com								

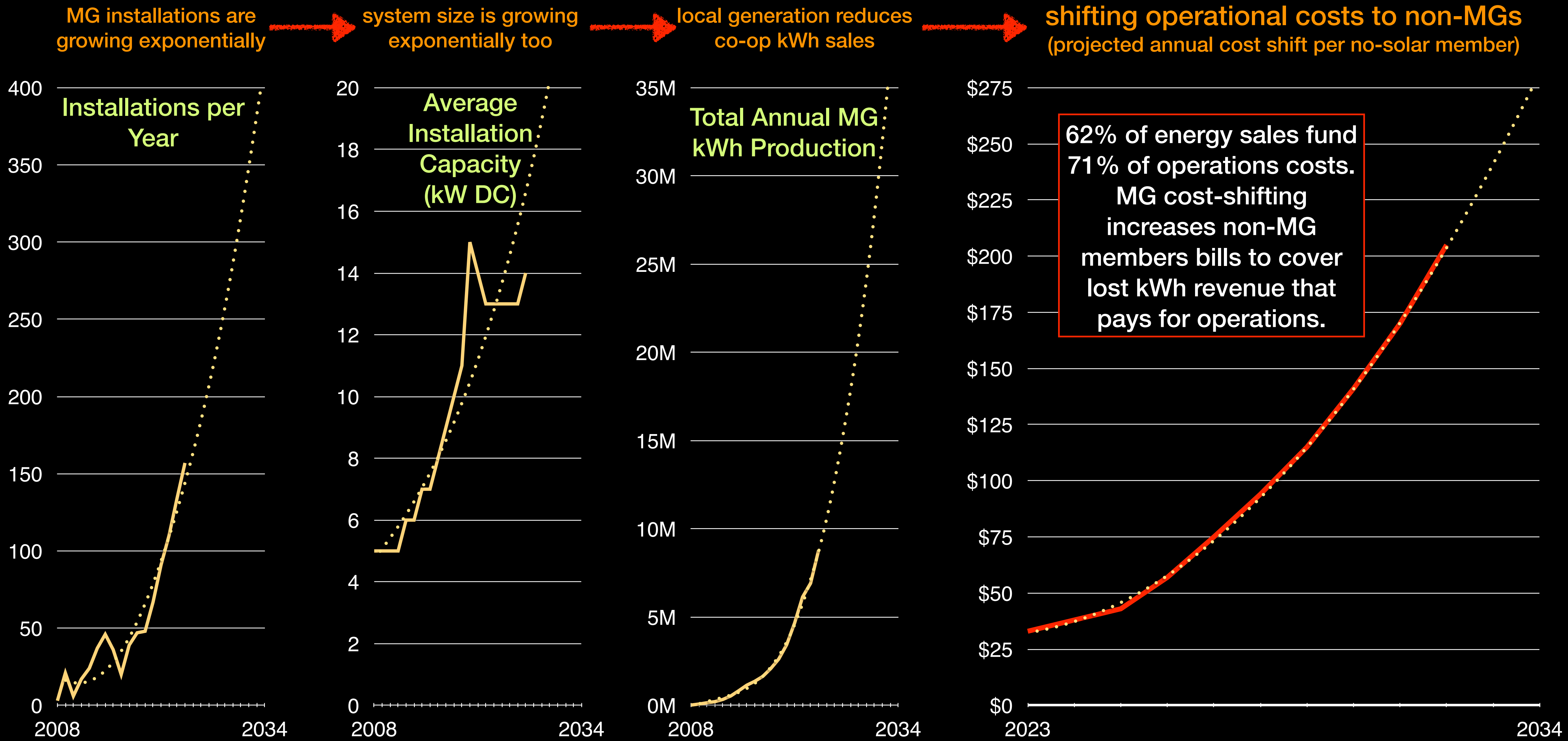
Total Land Area SJC			
175.22	sq.mi.		
112,141	acres		
Houses	13,619		
Average impervious area			
	3700	sq.ft. avg	
	50,390,300	sq.ft.	
	43560	soft/acre	
	1157	acres	
Land Bank	4000	acres	
SJ Preservation Trust	18000	acres	
Roche Harbor LLC	4000	acres	
WA State	6000	acres	
Fed Gov't	2141	acres	
Sub Total:	34141	acres	
Ag Land	18000	acres	
Forest Resource	19098	acres	
Rural Frm Forest	20000	acres	
SubTotal	57098	acres	
Roads			
length	757	miles	
width	55	feet avg	
area	5047	acres	✗
Total	97442	acres	

Rooftop Impervious Surface Analysis



	Developed Area	Estimated Rooftop Area	NREL Estimate	N+1 probability	
Friday Harbor	853 acres	167	100	20.0	acres
East Sound	1875 acres	59	35	7.1	acres
Lopez Village	197 acres	49	29	5.9	acres
				21.2	acres
				1.0	MW/6acres
				3.5	MW
Airports	339 acres	✗			
Urban Areas	3264				
Total Area accounted for	100706				

2023 Rooftop Solar Member Generator Analysis: Cost-Shift Forecast through 2032



Understanding OPALCO Renewable Energy Programs

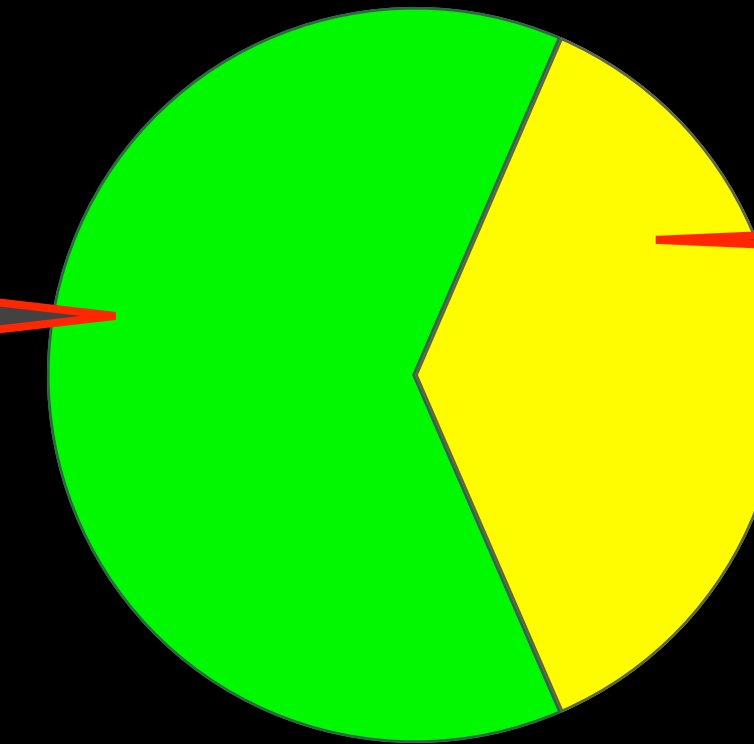
November Board Meeting Member Comment

- Is the Board aware that OPALCO's approach to the Renewable Generation Credit is unique in the state?

Answer

- OPALCO is a leader in more equitable approaches to rates and low-interest on-bill financing for renewables.
- Having renewables customers pay their fair share of the grid reduces cost shifting. That is financially equitable and consistent with the Washington CETA and CCA financial equity mandates.
- OPALCO renewable energy credits apply to exported energy only. Powering your home receives credit at the full retail rate.
- Since OPALCO introduced these innovations, solar projects, and installers have accelerated, tempered by a limited labor force and affordable housing.

Annual Hours of Production (%)



Powers home, reducing kWh sales at full retail rate

Sold to utility to meet other member's load, replacing BPA, at higher renewable energy credit rate.

	2020	2021	2022	2023	
Annual Installation Count	64	84	90	103	Total
					341
Average Installation Size (DC kW)	13.4	15.0	12.5	12.4	Avg.
					13.3
Installer Avg Installation Size (DC kW)					Avg.
ECOTECH SOLAR	9.4	11.3	46.6	18.3	21.4
WESTERN SOLAR	17.5	42.1	12.0	12.2	20.9
RAINSHADOW	11.9	11.2	9.9	13.1	11.5
SWIFTWATER SOLAR				11.2	11.2
SOLGEN POWER	9.0	6.7	12.5	12.6	10.2
Installations by Installer					
ECOTECH SOLAR	2	1	1	4	
WESTERN SOLAR	4	9	5	6	
RAINSHADOW	52	64	68	57	
SWIFTWATER SOLAR	0	0	0	14	
SOLGEN POWER	1	4	5	5	

Renewables On-bill Financing	2022	2023	Total
Solar and battery projects	64	89	153
Solar and battery financing	\$1,229,022	\$1,609,802	\$2,838,824

The Three Pillars of Washington Energy Policy

Rooftop Solar is a small fraction of what's needed, more expensive, with more cost-shifting

- ✓ **Net-zero GHG emissions by 2050** (50% reduction by 2030)
 - 5 years left to achieve 50% reduction
- ✓ **Energy Resilience**
 - Rooftop doesn't work during outages
 - Utility-scale solar + storage does, directed to critical services via sectionalized grid
 - Utility solar are tilting arrays to maximize winter production
 - Only 1,500 to 1,700 potential roofs (see appendix)
 - Only 3.5 MW of commercial rooftop and parking area
- ✓ **Equitable**
 - Rooftop costs 6X more than utility-scale solar (capital and power cost)
 - Rooftop solar cost-shifts operational costs to those who can't afford solar

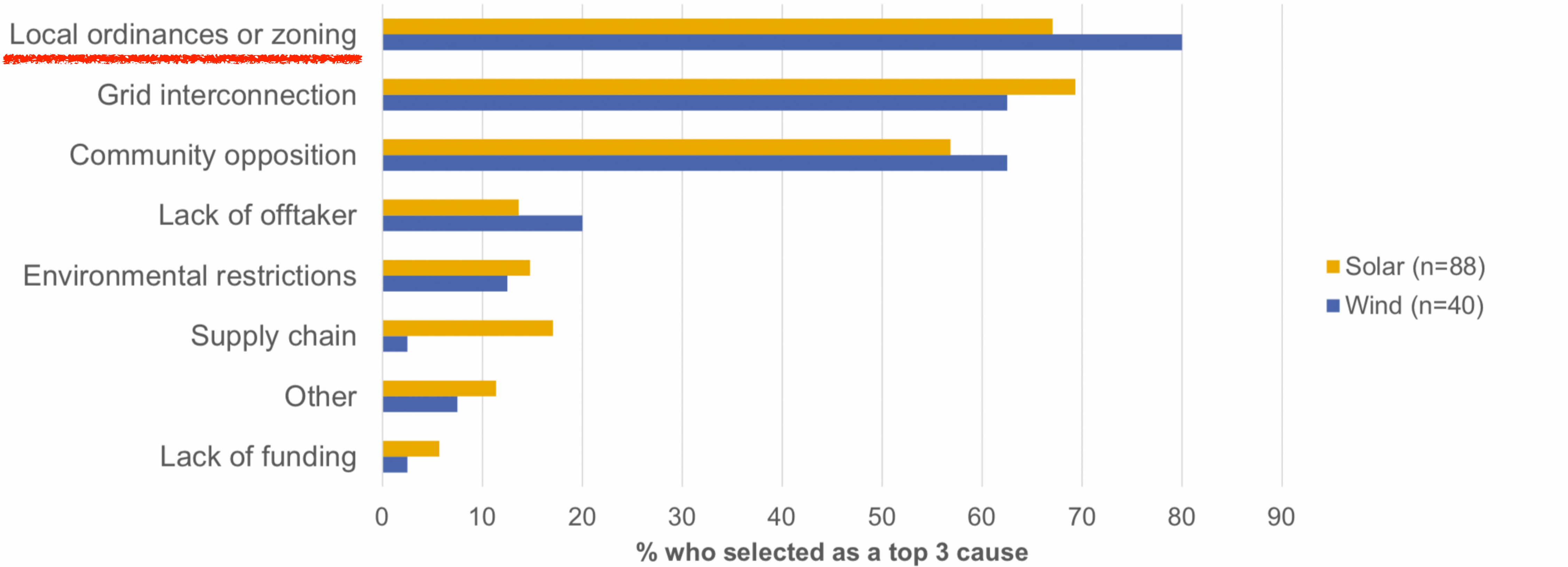
Permitting Evolution

...Some good news

The public wants clean energy, but they don't want to look at it. NIMBY = Not In My Backyard

Local ordinances, interconnection, and opposition are leading causes of cancelation for both wind and solar

Within the last five years, what have been the leading causes of solar project cancelation? (Select one to three)



NIMBY: *Not in my backyard* slowing new energy development

 Columbia Law School | COLUMBIA CLIMATE SCHOOL
SABIN CENTER FOR CLIMATE CHANGE LAW

Opposition to Renewable Energy Facilities in the United States: May 2023 Edition

U.S. NEWS

Tribes, environmental groups ask US court to block \$10B energy transmission project in Arizona

FORBES > BUSINESS > ENERGY

Here's The List Of 317 Wind Energy Rejections The Sierra Club Doesn't Want You To See



January 24, 2024

Large-scale wind and solar developers concerned about social factors affecting deployment

New Berkeley Lab survey of large-scale wind and solar project developers highlights industry concerns with the social factors that contribute to project delays and cancellations.

Large-scale wind and solar deployment is impacted by various technical, economic, and social factors. The social factors, such as community opposition and local ordinances and zoning, in particular remain under examined and are difficult to understand through existing data sources. This study surveyed industry professionals to gather insights from their experiences with project development and community engagement.

- **Projects Cancelled** Approximately one-third of wind and solar siting applications submitted in the last five years were canceled, while about half experience delays of 6 months or more.
- **Increased Cost** Project cancellations result in average sunk costs (expenses spent on the project that could not be recovered) of more than \$2 million per project for solar, and \$7.5 million for wind.
- **Projects Delayed** Local ordinances or zoning, grid interconnection, and community opposition are the top three leading causes of project cancellations for both wind and solar. These are also leading causes of significant delays.
- **NIMBY Accelerating** For both wind and solar, opposition is becoming more prevalent and is more expensive to address than it was five years ago.

NRDC, Sierra Club, and Others Are Evolving Their Thinking on Permitting

- ✓ NRDC
- ✓ Sierra Club
- ✓ World Resources Institute
- ✓ The Nature Conservancy
- ✓ Environmental Defense Fund
- ✓ Defenders of Wildlife
- ✓ National Audubon Society

Why?

They recognize that streamlining these processes is essential to scaling up clean energy deployment, meeting climate goals, and transitioning away from fossil fuels.

- Accelerate the Transition to Clean Energy
- Meet National and State Climate Targets
- Reduce Regulatory Barriers
- Promote Economic Benefits
- Improve Grid Resilience and Reliability
- Leverage Bipartisan Support for Clean Energy Economic and Energy Security Benefits

NRDC, Sierra Club, and Others Are Evolving Their Thinking on Permitting How?

- ✓ NRDC
- ✓ Sierra Club
- ✓ World Resources Institute
- ✓ The Nature Conservancy
- ✓ Environmental Defense Fund
- ✓ Defenders of Wildlife
- ✓ National Audubon Society

NRDC, Sierra Club and others support reforms that streamline the NEPA process without sacrificing essential environmental protections.

They recognize that streamlining these processes is essential to rapidly scaling up clean energy deployment, meeting climate goals, and transitioning away from fossil fuels.

- **Significantly reduce the time and cost it takes to permit renewable energy projects**
- **Align zoning laws with renewable energy goals.** This might involve supporting zoning reforms that make it easier to develop solar farms in areas where they would be most effective.
- **Addressing Local Zoning and Land Use Barriers.**
- **Promoting "One-Stop-Shop" Permitting Processes** with a more streamlined, coordinated framework for federal, state, and local agencies to review projects, reduce duplicative reviews and avoid multiple rounds of environmental assessments.