

The table below, along with other critical information, was presented by a grid expert at an October 18, 2023 Cascade Policy Institute Conference. Note that for this Winter, 2024-2025 the Northwest electric grid is projected to fall 927 megawatts short of demand. It is projected to be almost nine times as bad in 10 years.

The grid expert reported that they are talking about activating virtual generators at homes to help make up the difference when needed. For example, a virtual generator is equipped to switch the smart meter on a home which is charging an electrical vehicle at night and drain the EV battery charge back into the grid.

## Northwest Region Requirements and Resources

**Table 1. Northwest Region Requirements and Resources – Annual Energy** shows the sum of the individual utilities' requirements and firm resources for each of the next 10 years. Expected firm load and exports make up the total firm regional requirements.

Average Megawatts	2023-24	2024-25	2025-26	2026-27	2027-28	2028-29	2029-30	2030-31	2031-32	2032-33
<b>Firm Requirements</b>										
Load <sup>1)</sup>	21,814	22,791	23,694	24,558	25,545	26,225	26,485	26,681	26,841	27,006
Exports	520	502	502	501	501	501	501	501	501	501
<b>Total</b>	<b>22,334</b>	<b>23,293</b>	<b>24,195</b>	<b>25,060</b>	<b>26,046</b>	<b>26,726</b>	<b>26,986</b>	<b>27,182</b>	<b>27,342</b>	<b>27,507</b>
<b>Firm Resources</b>										
Hydro <sup>2)</sup>	11,459	11,439	11,424	11,462	11,424	11,402	11,200	11,200	11,161	11,005
Small Thermal/Misc.	28	28	28	28	28	18	11	11	11	11
Natural Gas <sup>3)</sup>	4,107	4,497	4,801	4,551	4,546	4,544	4,474	4,426	4,225	4,222
Renewables-Other	276	275	273	274	269	268	268	266	264	260
Solar	503	503	503	502	502	501	501	500	498	483
Wind	1,757	1,747	1,747	1,721	1,661	1,623	1,611	1,596	1,596	1,622
Cogeneration	41	41	34	32	31	31	31	31	31	31
Imports	488	488	467	467	453	380	324	310	310	222
Nuclear	1,116	994	1,116	994	1,116	994	1,116	994	1,116	994
Coal	2,583	2,356	1,593	1,065	1,068	891	583	479	497	508
<b>Total</b>	<b>22,357</b>	<b>22,366</b>	<b>21,985</b>	<b>21,096</b>	<b>21,097</b>	<b>20,652</b>	<b>20,127</b>	<b>19,810</b>	<b>19,708</b>	<b>19,357</b>
<b>Surplus (Deficit)</b>	<b>22</b>	<b>(927)</b>	<b>(2,210)</b>	<b>(3,963)</b>	<b>(4,949)</b>	<b>(6,074)</b>	<b>(6,859)</b>	<b>(7,372)</b>	<b>(7,634)</b>	<b>(8,150)</b>

<sup>1)</sup> Load net of energy efficiency

<sup>2)</sup> Firm hydro for energy is the generation expected assuming critical (8%) water condition (the methodology is changed for the 2023 report)

<sup>3)</sup> More energy may be available from natural gas power plants

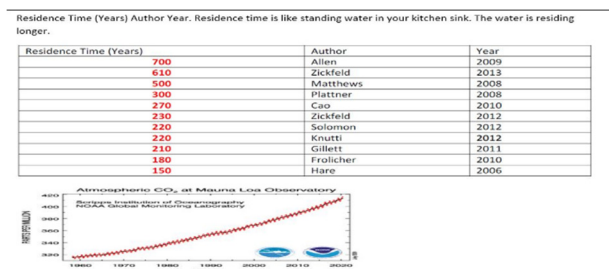
All carbon dioxide emissions related attempts to mitigate this have no effect for about 150 years due to the phenomena of residence time. Thus, there is no reason the dams can't continue to operate for 100+ years as a source of cheap, renewable energy.

Residence time for atmospheric Carbon Dioxide is like standing water in a kitchen sink with the drain plugged. The water resides for a long

period of time.

“Retention time” is the same idea as “residence time.” The average residence time for carbon dioxide is the average time a molecule of carbon dioxide, for example, stays in the troposphere, according to more than 160 PhD’s in 19 published manuscripts, summarized in one published manuscript. Anything we have done or will do with emissions of carbon dioxide will take 150 years to have any effect. Proof is any major events which would have lowered atmospheric carbon dioxide worldwide for which there is still no effect in the carbon dioxide rise data.

- Oil embargo in the 1970’s, for almost two years the worldwide carbon dioxide emissions would have dropped by 90%.
  - Multiple recessions each one the worldwide carbon dioxide emissions would have decreased by 40% for at least one year.
  - Worldwide recession in 2009. A 70% reduction in emissions of carbon dioxide for almost two years.
  - COVID-19 pandemic. A 6% reduction in emissions for 1.5 years.
- You can clearly see no signature from these events in the NOAA data.



Unrealized Global Temperature Increase: Implications of Current Uncertainties, Schwartz, S. E. J. Geophys. Res. , 2018, doi: 10.1002/2017JD028121.

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