

## PUBLIC COMMENT ON PUGET SOUND ENERGY 2015 INTEGRATED RESOURCE PLAN, DOCKETS UG-141169 AND UE-141170

Response by James Adcock

Electrical Engineer, specializing in Statistical Modeling,

Ratepayer, Resident of the Eastside and Long-time PSE IRP Participant.

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### CV

I am an Electrical Engineer, graduate of MIT, with over twenty years of industry practice in statistical modeling at some of the PNW's largest engineering companies, including patents issued in the area of statistical modeling. I am a long-time public participant in PSE's IRPs.. For the last 10 years I have worked full time in the area of rational PNW response to climate change, and regulatory design. I am the leading critic of PSE's modeling of Climate [what PSE calls "Weather Modeling"] towards their estimation of winter generation and transmission needs -- namely that PSE continues to ignore the large effects that PNW Climate Change has caused towards warming coldest winter days, making those days much more mild, thereby reducing peak winter generation and transmission requirements. When PSE ignores these large climate changes, it results in PSE Overbuild of generation and transmission resources, with PSE making unfair and excessive profits from that Overbuild, resulting in ratepayers unjustly having to pay unfair and excessive rates. It is not prudent that PSE continues to ignore the reality of climate change in their modeling efforts – they have acknowledged the reality of climate change on the corporate level, while continuing to ignore climate change in their modeling group. They have a requirement as part of the Macquarie acquisition to acquire and maintain competent environmental expertise. That should include retaining the expertise of real climate scientists to inform their modeling efforts, and the degree to which they choose to continue CO2 pollution from existing plants, as well as the choice of emission rates from additional CO2 pollution from new proposed plants.

I am only one of two non-paid individual IRP participants, and – after Industrial Customers having quit PSE's IRP process out of disgust at PSE's continued blocking their access ["Freeze Out"] – the only participant continuing to express concerns over PSE's Overbuilding. Because of my criticism of PSE modeling efforts, PSE has singled me out for discrimination, preventing my participation in many of the 2015 IRP meetings. I have uniformly argued for many years that PSE not only needs to avoid needless and excessive damage to the environment, but PSE also

needs to avoid needless and excessive damages to ratepayer pocketbooks. It is not a question of just doing one or the other. PSE must **BOTH** run their business to minimize internal costs, and to minimize external environmental damage costs – most often minimizing the cost to human society from needless and excessive CO2 emissions, but also in the case of Transmission Planning, avoiding needless and excessive local environmental damages to ratepayers’ homes, leading to blighted communities.

## SUMMARY POSITION STATEMENT

Instead of blocking my participation, PSE should be responding openly and honestly to my criticisms, including addressing my suggestions, which includes as a starting point simply making one comparative modeling run which only uses the last 20 years of weather data as opposed to 80+ years – i.e. perform a quasi-stationary analysis – and for PSE to publish the modeled weather dates corresponding to their modeled system failures (Loss of Load) on their full 80+ year historical modeling runs, in order to show publicly whether (as they claim) those failures are uniformly distributed over the last 80+ years of weather data, or rather (as I claim) those failures are highly concentrated in the archaic historical coldest weather modeling days from the 1950s-1960s – and earlier years, over half a century ago – i.e. failures corresponding to weather conditions which no longer exists in today’s PNW Climate as a result of Climate Change.

I ask the Commission respond to PSE by telling PSE that they have not demonstrated that the proposed NG Peaker Plant is necessary to serve Washington Ratepayer load – as opposed to using Washington ratepayer dollars to build a NG Peaker Plant to be used to serve Californian Load via the California Energy Imbalance Market. PSE has not demonstrated the need for the NG Peaker Plant because PSE has not reasonably modeled the effects of Climate Change on making the coldest winter (Peak) days much more mild. There is nothing to stop PSE from building a NG Plant to serve Californian load via the California Energy Imbalance Market if they want to – it’s just that PSE needs to **use their own money** if they want to expand their business to serve the Californian Energy Imbalance Market – rather than using **Washington ratepayers’ dollars to serve Californians**.

Further, I ask that Commission “Not Acknowledge” PSE IRP submission, based on PSE preventing public participation, substituting instead secret meetings with limited participation not the required public participation, a general refusal to allow two-way conversations between me and PSE at IRP meetings, and not allowing disagreements to be expressed, substituting instead “public **presentations**” for actual “public **participation**.”

In addition, I ask that Commission “Not Acknowledge” because PSE has in general failed to respond to Commission requests from their 2013 acknowledgement letter (requests which I have extracted into an addendum in this response.) Some of those requests have been met, but in general PSE has failed to respond to Commissioners requests from the previous IRP.

Note further that for many years PSE has claimed they would respond to climate change once we have global agreement to deal with climate change. We now do have global agreement to deal with climate change. ***PSE: Now Do It!***

## INTRODUCTION

In this 2015 round of the IRP process PSE:

- Steps up their blocking of public participation of those critical to PSE's proposed new building projects – namely myself, holding separate secret IRP meetings for UTC and AG staff, and for environmental groups, with secret conversations, separate from the public IRP meetings, where PSE can tell a different story than in their public presentations. If (say) PSE misrepresented in these secret meetings, I was blocked from participation – I can say or do nothing to prevent that PSE misrepresentation, nor can I even alert staff members and environmental representatives of that misrepresentation. If PSE and environmental organizations discuss a “tit for tat” agreement to allow Overbuild in exchange for environmental benefits, again, I was not allowed to be there to complain – it is not a question of Over-profiting by Overbuilding vs. Over-damaging the environment, rather it is a question that PSE should not be allowed to Over-profit at all – neither by Overbuilding nor Over-damaging the environment.
- Continues to Overbuild, and thereby Overcharge ratepayers, by ignoring the large effects of climate change on the coldest winter “peak load” days which have become much much warmer.
- Continues to ignore Commissioners' requests from the previous 2013 IRP acknowledgement letter.
- Ignores the NWCouncil 7<sup>th</sup> Power Plan [draft] which shows no new NG generation is required in the PNW.

## PSE IS BLOCKING PUBLIC PARTICIPATION IN THE IRP PROCESS

PSE has acting increasingly unreasonable in their 2015 IRP actions, blocking my "public participation" presence at all in about half of the meetings -- contrary to the clear requirements of the state regulations "public participation is essential." When I asked during the initial IRP planning meetings simply that PSE actually respond to the Commissioners' questions and requests from their 2013 IRP response letter, and that the public actually be allowed to participate, by allowing participants to respond to PSE, rather than PSE simply giving presentation without a chance for the public to respond or ask questions, PSE instead acted to prohibit my presence entirely from many of the IRP meetings, meetings which one participant who was allowed to attend described to me as being "settlement talks." Quote: "Jim, the reason you are not being allowed into these meetings is because they are settlement talks." When I spoke up in initial IRP meetings against PSE's plans to have secret meetings, PSE instead misrepresented in the meeting notes for that meeting that there had been no opposition to PSE's

suggestion of secret meetings. On the contrary, I spoke out clearly that I thought such secret meetings were a bad idea, and bad public policy. I believe it is inappropriate that UTC staff members participate in "settlement talks" with PSE, and certain environmental groups, without public access to those meetings. At best, I believe it can only be described as poor public policy to have such "settlement" talks behind closed doors, and it is certainly inappropriate to have them as part of the "IRP public participation" process. When UTC and AG staff participate in such secret meetings they demonstrate bias in favor of PSE and against ratepayers.

"RCW 80.28.090 Unreasonable preference prohibited. No gas company, electrical company, wastewater company, or water company may make or grant any undue or unreasonable preference or advantage to any person, corporation, or locality, or to any particular description of service in any respect whatsoever, or subject any particular person, corporation or locality or any particular description of service to any undue or unreasonable prejudice or disadvantage in any respect whatsoever."

I believe PSE has made such an undue and unreasonable preference in the favor of the representatives of certain environmental groups, and shown undue and unreasonable prejudice and disadvantage in respect to participation in the IRP by this resident of the Eastside, unreasonable preference in refusing to allow this Electrical Engineer, representing ratepayers, to go to the "Technical Advisory Meetings".

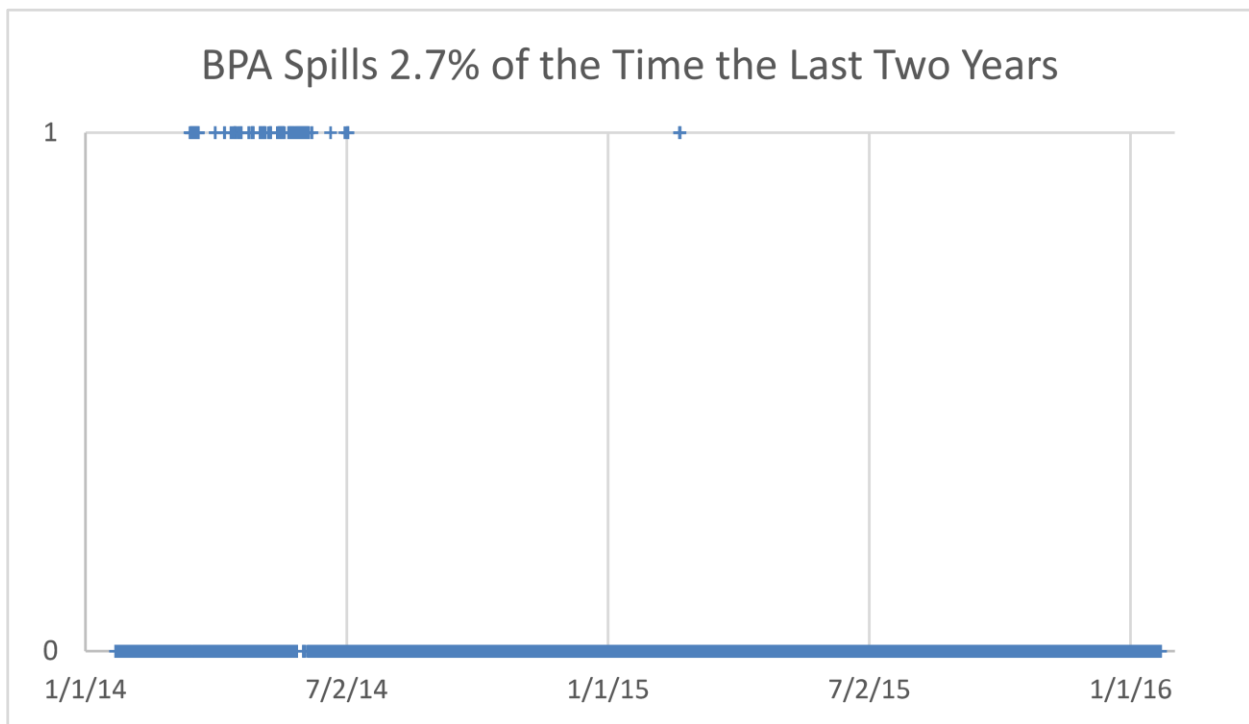
Further, even at the IRP meetings where I was allowed to attend, PSE through their facilitator, threatened me if I were to ask questions, disagree with PSE conclusions or statements of "fact", or to respond in general to PSE statements. And Mr. Popoff repeatedly engaged in "shout downs" to prevent me from literally even saying once sentence. Again, I remind you that I have specifically asked that IRP meetings be audio recorded so that you could hear for yourself what has been going on!

I caution readers of this response that PSE has a history of stating false "facts" to IRP participants. I have called PSE on some of these false "facts" previously, and in at least one case PSE has had to publicly acknowledge that they did not in fact perform the analysis that they claimed they had performed, but rather they just assumed they knew what they were talking about, and then presented to IRP participants their assumptions as-if they were facts – without actually performing the analysis. Namely I am referring to PSE's statement in the previous IRP cycle that "Wind Power costs us \$200 per ton CO2 displaced" – which I strongly objected to as being about 3X higher than other sources have stated for the cost of Wind re CO2. Now this IRP cycle PSE was forced to admit that they hadn't actually even performed the analysis, and that after they actually performed the analysis they found that their \$200 / ton numbers were way too high.

My concern is that by excluding me from these "secret" IRP meetings with UTC and AG staff, and environmental groups, PSE is preventing me from questioning other false "facts" which PSE

is presenting to these non-public participants, leading those participants, including UTC and AG staff, to form false conclusions.

I believe we have seen yet-another round of these falsehoods in this round of IRP meetings, where PSE has stated that the reason (according to PSE) that Wind is not effective in reducing CO2 emissions is that it simply increases the amount of Hydro Spill. This PSE claim is simply false, because the hydro system rarely spills due to Oversupply. In fact, over the last two years Hydro has spilled about 2.7% of the time, meaning that the CO2 reduction effectiveness of Wind is only reduced by about 3% (or less – Spill doesn't necessarily mean Wind is being wasted at 100% -- Spill may only partially displace Wind generation.) And further, as seen in the below plot, now that BPA is having to compensate Wind operators when shutting them down during Oversupply, now suddenly BPA is finding that it basically doesn't have to spill at all!



BPA Spill Flag Data. <http://transmission.bpa.gov/business/operations/Misc/default.aspx>

While on average BPA has spilled 2.7% of the time during the last two years, now that BPA is having to compensate Wind Operators when BPA shuts them down – suddenly BPA is finding it doesn't have to spill hardly at all! When BPA doesn't spill, then contrary to PSE claims, Wind remains 100% effective at displacing Fossil Fuel CO2 emissions, coal or natural gas.

Perhaps now is a good time to remind ourselves of the relative costs of new generation plants, where we can see, if one includes CO2 damage costs, that NG Peakers are really no bargain!

LCOE -- Levelized Cost of Energy (EIA)			Total Cost \$/MWh w CO2		
	LCOE	lb CO2/MWh	CO2 Economic Damage at \$50/ton	total	total at \$100/ton
Coal	\$95	2000	\$50	\$145	\$195
NG CC	\$75	1000	\$25	\$100	\$125
NG Peaker	\$141	1500	\$38	\$179	\$216
Wind	\$74	0	\$0	\$74	\$74
Solar	\$125	0	\$0	\$125	\$125

Recent peer-reviewed articles by real climate scientists in real scientific journals dedicated to the study of climate change (such as Nature Climate Change) put the CO2 economic damage costs at around \$100 / ton. At that level of CO2 damage, Wind total costs are \$74/MWh, compared to NG Peaker costs of \$216/MWh – Wind is Cheap, NG Peakers are almost 3X as expensive.

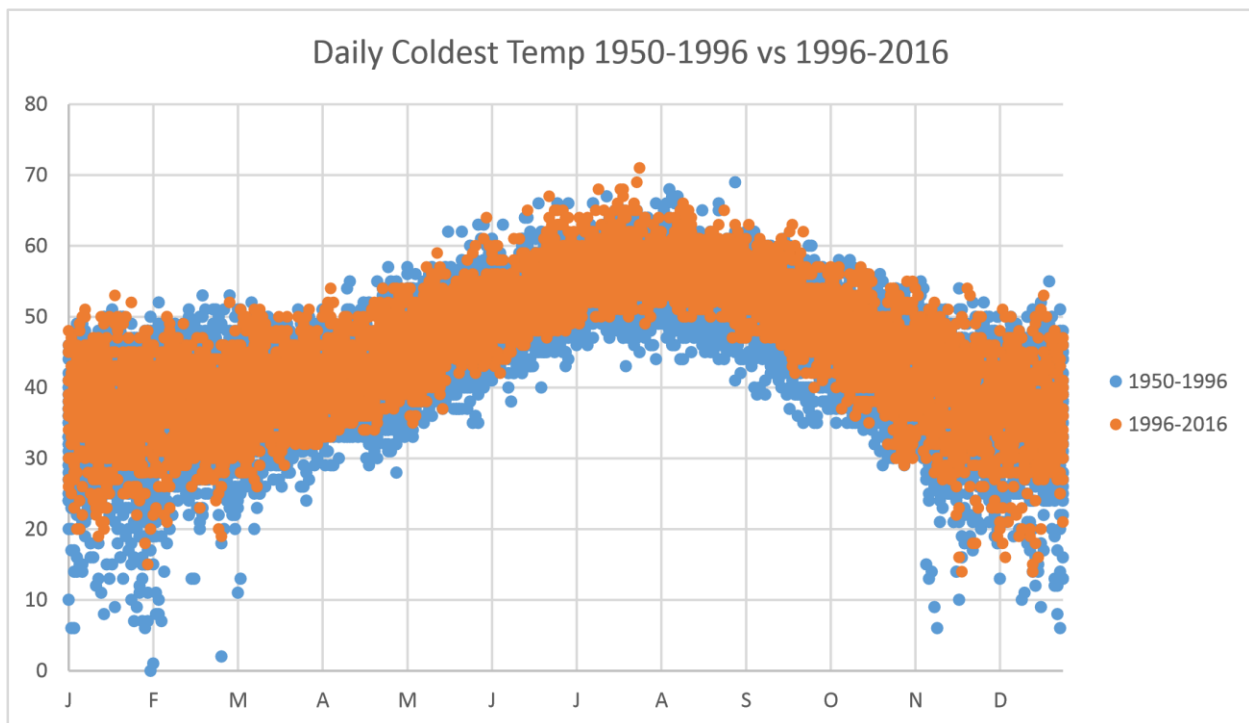
If a NG Peaker runs, it is very expensive to society, due to its high CO2 damage costs – almost as bad as coal power plant. But if it doesn't run, then the entire approx. \$200 million cost of the NG Peaker is a dead-loss to ratepayers. Take your pick, either way NG Peakers are a really bad idea!

## OVERBUILDING BY IGNORING THE IMPACT OF ALREADY EXISTING CLIMATE CHANGE ON PEAK WINTER LOAD

I am particularly critical of PSE's desires to build more NG Peaker plants while ignoring the effects of climate change, as well as PSE's actions to build an industrial scale 220KV transmission line through prime residential neighborhoods of the Eastside. Due to climate change, the coldest winter days in PSE's major load areas have become much, much more mild, leading to greatly reduced needs for PSE peak generation and transmission load. PSE has

responded to these criticisms not by taking reasonable actions to include the effects of climate change on their coldest winter days' load modeling, but rather by expelling me from their "public" IRP meetings.

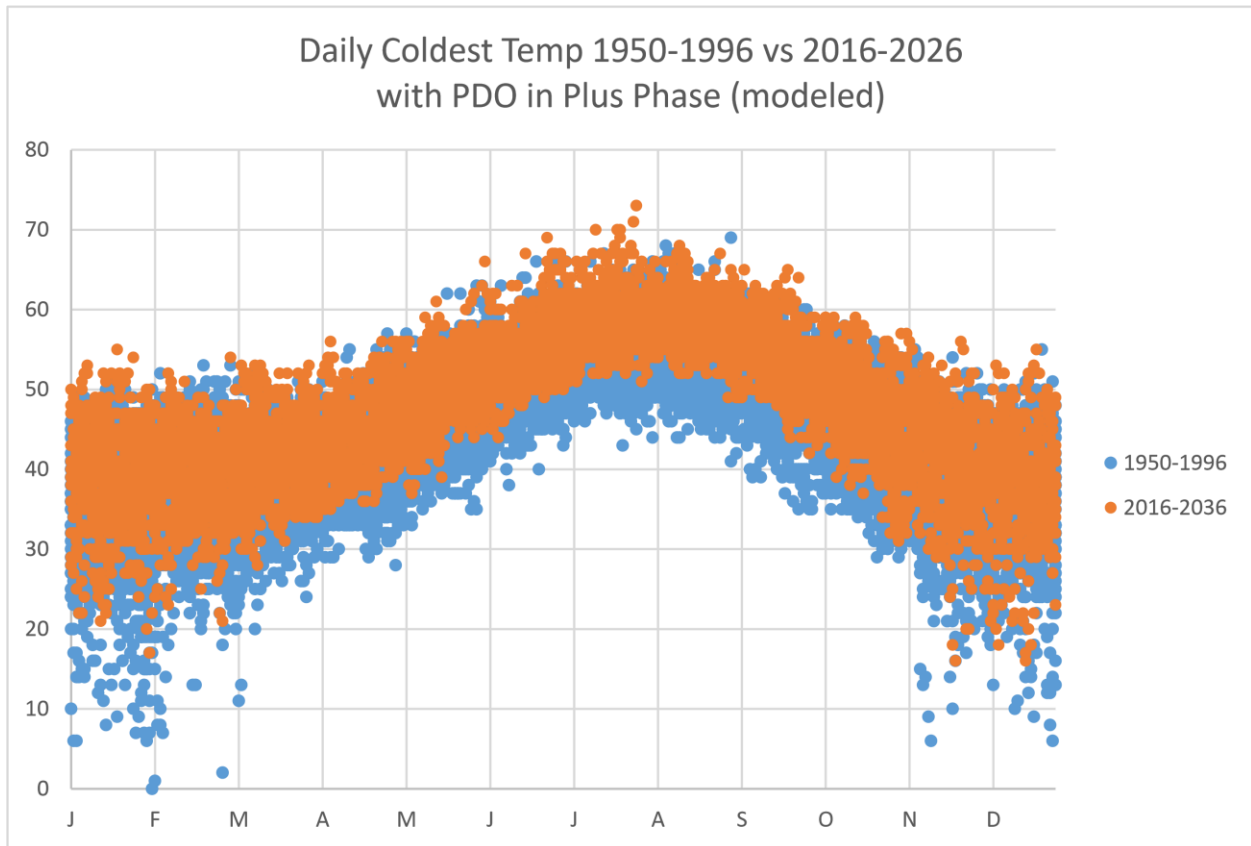
The below plot shows one dot per day for the coldest daily temperatures from the 1950s to date – about 24,000 data points. This is using NOAA SEATAC measurements as the reference temperatures – the same as PSE uses. Note the blue dots below (say) 10 degrees F during the winter months. Those coldest days all happened many many decades ago, 60+ years ago, when the climate was much less mild. In recent decades the coldest days have not gone below 13 degrees F – about a 25% reduction in heating load (HDD – Heating Degree Day, typically taken as outside temperatures measured below 65 degrees F)



When PSE designs their systems based on their new excessive “Once in 100 Years” criteria, what they are saying is that they are designing a system which would have not lost load even once in the 80+ year past record of coldest temperatures, temperatures going down to 0 degrees F (32 degrees below freezing) – ignoring the fact that coldest winter days (below 15 deg. F) have become much much warmer during that time frame. In the above plot the dots correspond to NOAA recorded lowest daily temperatures at SEATAC [the same location PSE uses for it calls its “Weather Modeling” [actually: “Climate Modeling” – you cannot model “Weather” 20+ years in advance.]

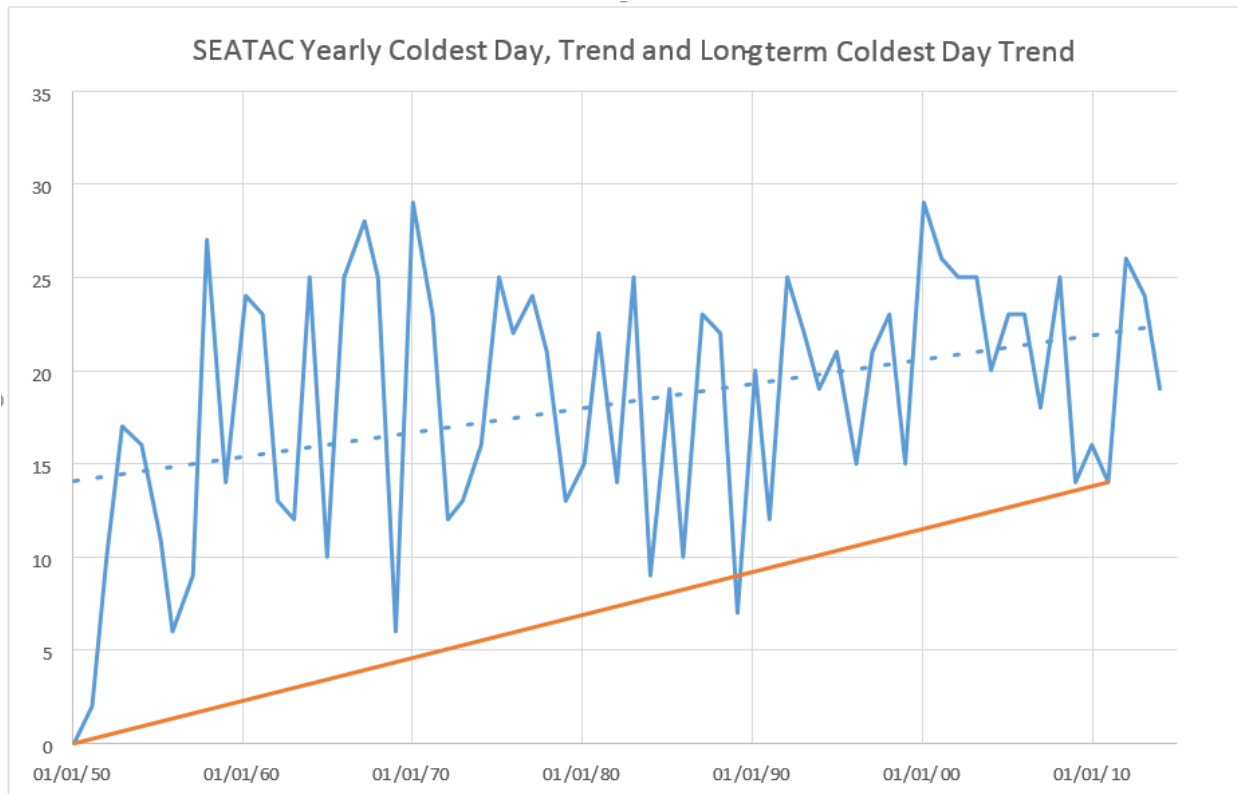
As An Aside: “Climate is what you predict, Weather is what happens.” One cannot model “Weather” long-term into the future 20-30 years. One can only model Climate – that reasonable statistical range of weather which might happen in the future. Of course PSE doesn’t want to call their modeling efforts “Climate Modeling” because that would force them to acknowledge that Climate is Changing, and thus their modeling efforts should be modeling those changes, instead of ignoring those climate changes – as is PSE’s current practice. PSE ignores climate change because it is very profitable for them to do so – resulting in Overbuild, and excess profits from that Overbuild. So PSE doesn’t want to call their Climate Modeling “Climate Modeling” – and so they call it “Weather Modeling” instead. As we know from watching our local weather men and women on TV, we can only model “Weather” for a couple days into the future – if then! Again, what PSE is actually doing is “Climate Modeling” not “Weather Modeling.”

Now in addition, recently the PNW has experienced a change in the phase of PDO – the Pacific Decadal Oscillation. The PDO has shifted from its cold phase to its warm phase, further warming the PNW by several degrees F for the next 20-30 years – the lifetime of PSE’s proposed additional new NG Generating Plant. Below Plot of Climate Change includes a (modeled) conservative estimate of additional warming corresponding to the recent change of phase of the PDO – Pacific Decadal Oscillation – from its cold phase to its warm phase, further warming the PNW for the next 20-30 years – during that lifetime of PSE’s proposed new NG Peaker Plant.





Plot of Daily Coldest Temperatures with an additional (conservatively modeled) +2 degrees F in future temperatures due to PDO shifting to its Warm Phase.

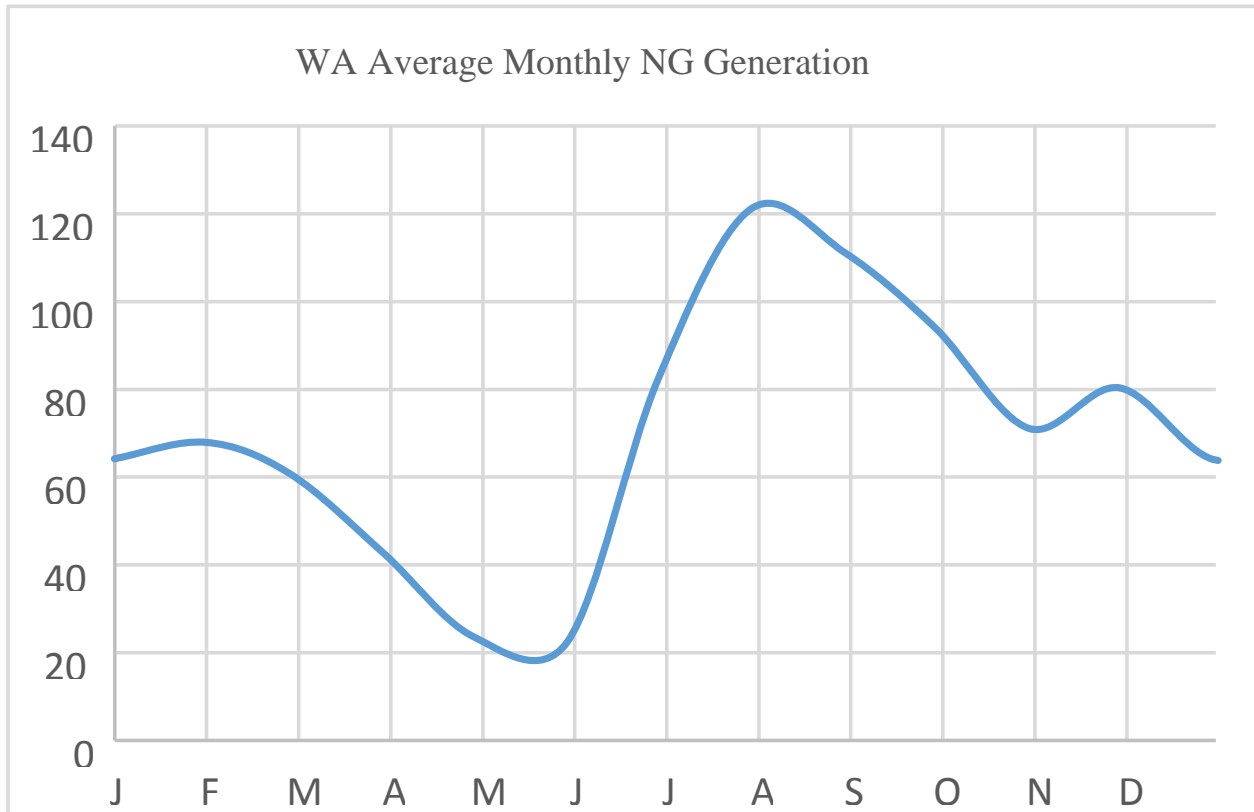


Another way to look at this data is to plot out the trends in each year's coldest day, showing that since 1950, the coldest yearly day trend has warmed (become more mild) by about 15 degrees F.

But, in addition to the fact that the reality of PNW coldest winter days is much much more mild than PSE's modeling would imply, in addition the reality is in Washington State, Net of Hydro, Washington State isn't even remotely Winter Peaking. In fact in Peak Summer Months, Washington State generates twice as much Natural Gas generation as during the Winter. This is because Hydro is itself Winter Peaking, and becomes more Winter Peaking as Climate Change increasingly warms the PNW, causing more and more Winter Precipitation to fall as rain, immediately turned into Hydro power, rather than historically falling as snow, where that potential energy was "banked" by Mother Nature, melting later in the Spring and Summer, and turned in Hydro power then, later in the year.

The result is that the Washington, the PNW, and California, are increasingly relying on NG generation (shipped in part from Washington to California over the Cal Interties – Washington exports 10% of its total generated electricity to other states, primarily California) to meet

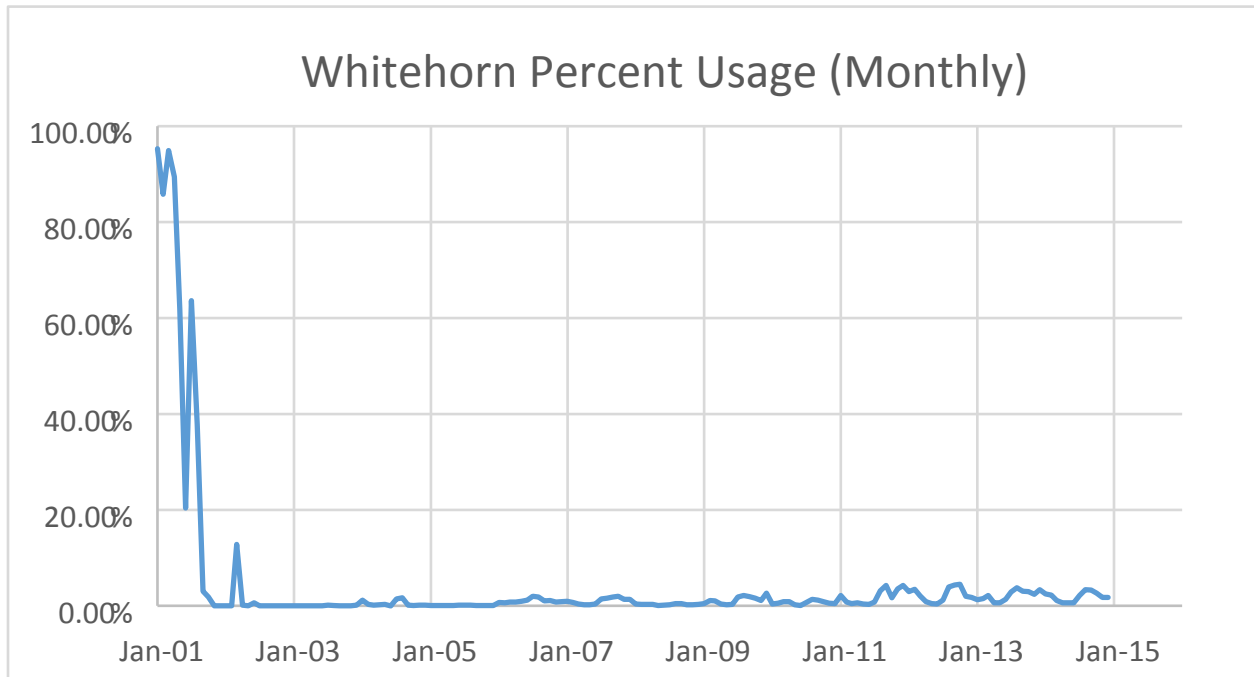
summer load. Below find a plot based on EIA data of WA average monthly NG generation, showing 2X as much NG Power is generated in August as compared to during Winter Months:



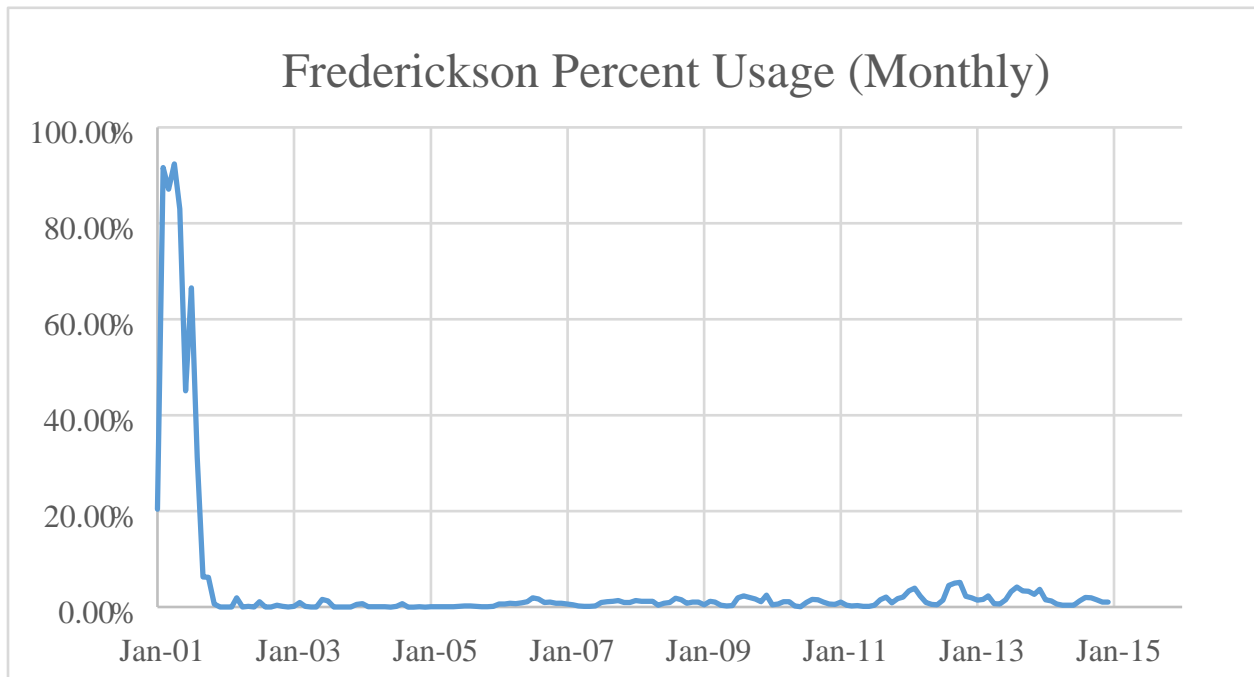
As part of the Macquarie-purchase requirement PSE is required retain competent environmental expertise – as opposed to the continued climate change denial PSE is demonstrating in their “Weather” modeling. Did they retain leading regional climate scientists, such as Philip Mote of the Oregon Climate Change Research Institute, or Amy Snover of the University of Washington Climate Impacts Group to help them with their Climate modeling efforts? No they did not. Instead of retaining competent environmental expertise, PSE chose to deny the reality of climate change in their modeling effort. Why? Because Overbuilding is hugely profitable for PSE!

Now PSE is claiming that they need a new NG Peaker plant to meet Peak Winter Loads. Let us take a look at PSE’s *existing* Peaker Plants to see if even *they* are being used to meet Peak Winter Loads. Below find plots of PSE’s existing Peaker Plant utilization (using EIA data.) Do you see any pattern of the existing peaker plants being used to meet Winter Loads? Is there a strong uptick in peaker plant usage at say each vertical grid line – corresponding to the winter months? No there is not. PSE **IS NOT** in fact even using their existing Peaker Plants to meet winter loads! PSE has enough capacity of meet winter loads without even using their existing Peaker Plants. PSE did use these plants to provide load to California during the California market meltdown in the 2001 time frame. And if the Californian markets were to meltdown

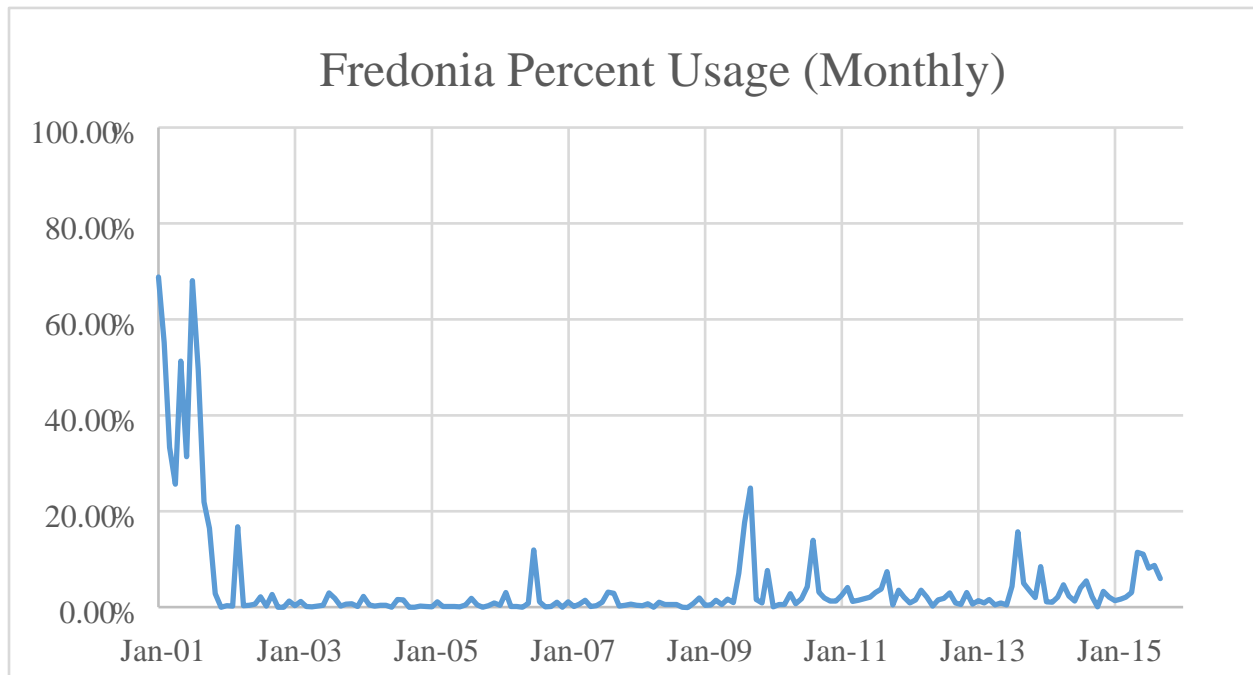
again, PSE would be well positioned to subsidize Californian ratepayers once-again. PSE Peakers do not in practice protect Washington ratepayers, rather in practice PSE Peakers protect Californian ratepayers.



Whitehorn shows little utilization, and no pattern of use for Winter Peaking, since Cal Meltdown



Frederickson shows little utilization, and no pattern of use for Winter Peaking, since Cal Meltdown



Fredonia shows little utilization, and no pattern of use for Winter Peaking, since Cal Meltdown

In the 2013 IRP cycle PSE claimed that Wind costs \$200 / ton CO2 to reduce carbon. This 2015 cycle they were forced to admit that they hadn't even actually performed the analysis, and that now that they have performed the analysis they now think this number is closer to \$120 / ton – a number I still think is way too high to reflect reality. I believe PSE modeling of the CO2 benefit of Wind improperly ignores Wind benefits being expressed outside of the PSE system – PSE doesn't capture those benefits, but PNW society does. Since CO2 is a global problem, where the Wind benefits are captured doesn't matter, whether within PSE area, or say as additional Hydro impoundment in BPAs' area – where the Wind helps us carry more impoundment into the late summer periods when we are low in impounded water – and rainfall. Wind, in practice, turns into more stored Hydro Power – without having to build additional dams.

Now again, in the 2015 IRP cycle Mr. Popoff is claiming that Wind doesn't create a benefit, that it just causes more hydro to spill. Except that BPA maintains a "Spill Data Flag" record (plotted earlier above) that clearly shows that BPA does not hardly spill at all.

**OVERBUILDING BY SETTING UNREASONABLE AND UNNECESSARY 1% LOLP STANDARD**

PSE proposed increase to 1% LOLP equals a "Once in 100 Years" benefit -- but the NG Peaker generating capacity only has a lifetime of 20-30 years. There is no legal requirement for a 1% LOLP, but there is a requirement for 5% LOLP -- which is "Once in 20 Years" -- better corresponding to the actual lifetimes of generating equipment. [Feds pass reliability requirements to FERC who passes reliability requirements to NERC who sets the 5% LOLP requirement] PSE is unreasonably moving to a "Once in 100 Years" standard in order to facilitate their efforts to justify and Overbuild a new NG Peaker Plant.

In addition, PSE makes outrageous claim that this Overbuild is "Optimal" -- that building this plant reduces ratepayers overall costs. This claim is clearly false. It is based on PSE denial of the reality of climate change, resulting in PSE building a system based on 1950s' weather data. The system being built *would* be optimal if we still lived in the climate of the 1950's -- but we do not. The coldest winter days, corresponding to peak generation need, are now much much warmer than in the climate of 65 years ago, resulting in 25% lower peak generation requirements than PSE is claiming.

Further, Low and stable Mid-C prices of about 2.5 cents per kilowatt/hour (discussed further below) demonstrates the huge excess of NG generation capacity already available in the region. If we had any shortage of NG generation, then Mid-C prices would be high and spikey, not now and stable -- especially during PSE's claimed winter peaking months. We have no shortage of NG generation.

An additional reason why this choice of Overbuild is not "Optimal" is the following: "Optimal" would imply that there is not a lower cost way of reaching the same level of reliability -- actual Loss of Power by the ratepayers -- what utilities call "Loss of Load" ratepayers call "Loss of Power" or more commonly: "Honey -- the Power's Out Again!" In my area of the Eastside, which does not have a lot of trees, is not at the end of a long feeder line, and where our neighborhood has the lines buried underground, we are still experiencing about 10 Loss of Power events a year! Not PSE's "1 in 100 Years" by rather "10 in 1 year!" Or, to rephrase using PSE's terminology "1000 Loss of Powers in 100 Years!" Why the disconnect? We are actually experiencing 1000 outages, when PSE's modeling says we are experiencing one outage! The simple answer is that PSE is trying to fix a problem which does not exist, while ignore the real problems which do exist -- which is PSE lack of effective tree maintenance, and refusal to install effective squirrel and critter guards. For perhaps 1/100<sup>th</sup> of the amount of money PSE is asking for another unnecessary NG Peaker Plant, PSE could instead effectively manage trees and critters, actually reducing our common, and continual, outages. PSE: Solve Real Loss of Power Problems, Not invent fake ones. Solving real problems is "Optimal", inventing fake problems is not "Optimal" unless one is talking about "Optimally" wasting ratepayers' dollars -- while PSE profits from that waste.

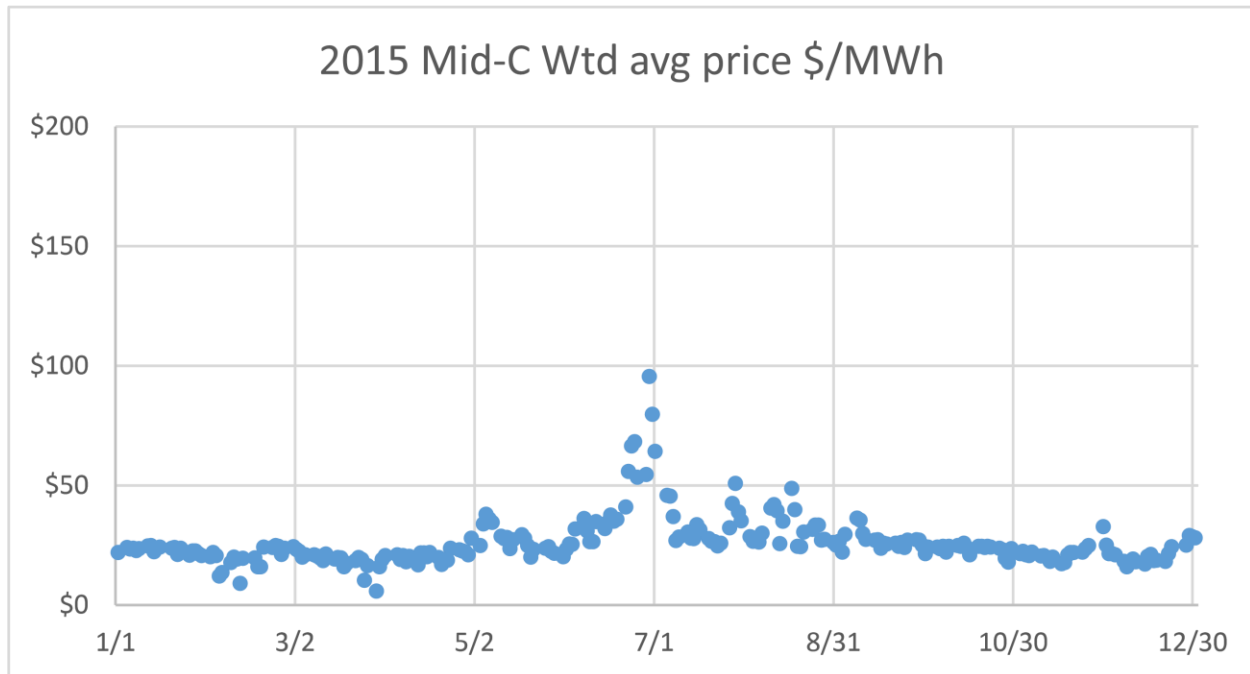
**NWCOUNCIL 7TH PLAN SHOWS NO NEW NG REQUIRED**

In the 7<sup>th</sup> Plan [draft at this point in time] NWCouncil is signaling that they understand that now under the Obama Clean Power Plan it is no longer acceptable that BPA sell PNW Hydro power down to California while ignoring the environmental attributes of that carbon-free power for the PNW. NWCouncil is signaling that they will be pushing BPA instead to make that power more readily available on a contract basis to PNW utilities such as PSE. PSE, instead of trying to build more-and-more new NG generation, should instead try to fairly secure contracts with BPA for this clean, cheap, local hydro power. Rather than having BPA continue to sell it down to California.

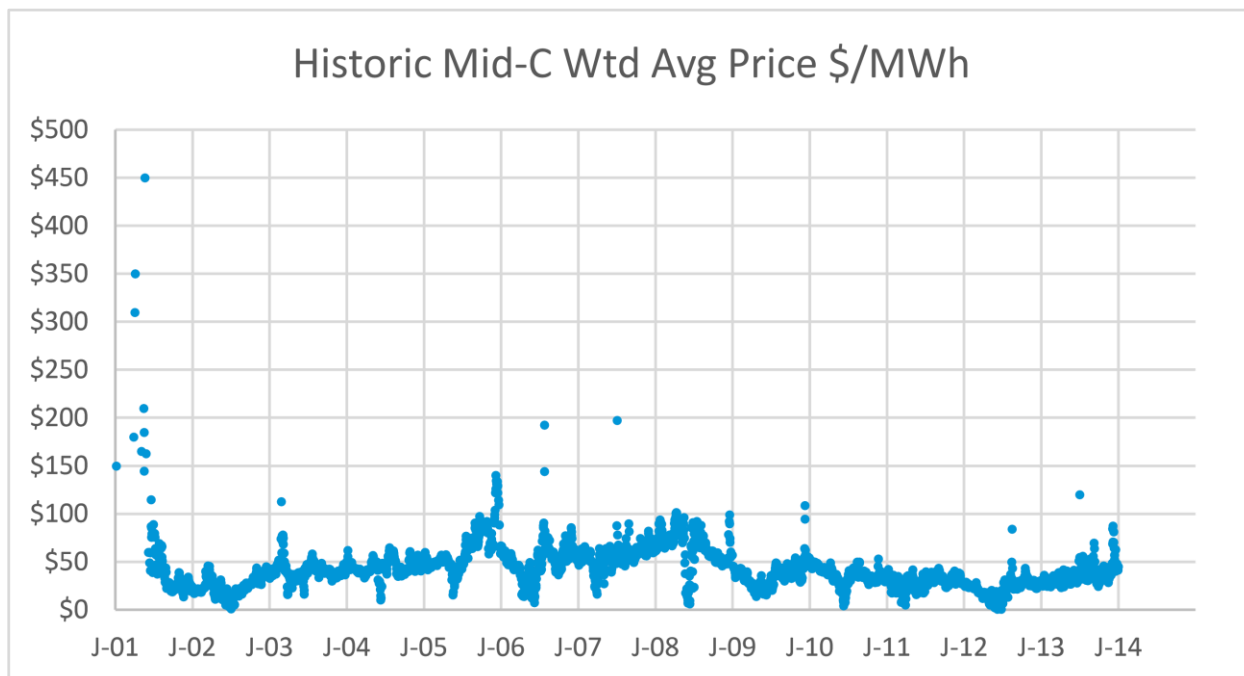
PSE's continued plans to build more-and-more NG generation stands in sharp contrast to the Northwest Council modeling group, who in their 7th Power Plan (draft) recognizes that no new NG generation is necessary in the region -- while stating that they expect some utilities are going to build new NG anyway. Further, modelers for the 7th Plan acknowledge that while they did not include the effects of climate change warming in their modeling, they probably should have done so.

## MID-C PRICES ARE LOW, BENIGN, WELL-CONTROLLED, AND SUMMER PEAKING NOT WINTER PEAKING

Please find attached two plots of Mid-C prices which demonstrate, contrary to PSE claims, that a new NG Peaker plant is NOT needed for Winter Peaking Needs. PSE acknowledges that they essentially “dispatch to market”, meaning based on Mid-C prices. If there was a shortage of Winter Peak Power then, Mid-C prices would jump much higher on those cold winter days. And, historically, as shown on the long-term historical plot, there have been such winter days – extremely rarely – prior to 2008. Since 2008 there have been rare high-priced Peak days – again, very rarely – but those have been Summer Peaking days, NOT Winter Peaking days. Conclusion: The region, and thereby PSE, net of BPA hydro power, is actually SUMMER peaking, not winter peaking as claimed by PSE. There is not a need for a new NG Peaker plant to meet winter peaking needs. Summer Peaking happens because in the summer we start to run out of BPA hydro power, we (the PNW) competes with California and regions south for power – AND because PSE mistakenly engages in a “PG&E Seasonal Exchange” contract where PSE sells power to PG&E during the summer when we are actually short of power, and buys power from PG&E when we are actually long on power [again, net of hydro] And there is no need for a Natural Gas Peaker during the summer, because these high-priced days happen so rarely that it is not nearly profitable to own a NG Peaker plant to cover those rare occurrences.



2015 Prices have been low and benign, trading recently around 2.5¢ / kWh (\$25 / mWh)– except briefly during the late summer period. This compares to about 36.2¢ / kWh (\$362 / MWh) for the levelized cost of NG Peaker Plants according to “The Levelized Cost of Electricity from Existing Generation Resources” June 2015, Institute for Energy Research. IE rational total cost of dispatch of an NG Peaker even during the rare peak summer days is still 3X too expensive to be useful. On a typical recent trading day prices have been about 14X too low to make owning an NG peaker plant a rational thing to do.



Historically Mid-C prices “blew up” in 2001, in the summer, not in the winter, as the California rational market for electricity collapsed, in part due to regulatory failures. "The California Electricity Crisis: Causes and Policy Options" 2003, Public Policy Institute of California. Thus, briefly, in 2001, a NG Peaker would have been “in the money” – it would have made sense to own a Peaker on those few days – if you could own a Peaker on just those few days. Since then prices have not come close to the \$362/MWh mark, even on a single day, let alone on average. Price spikes happen almost always during the summer, not the winter (a winter spike would happen near one of the above vertical grid marks, summer spikes fall in the middle between vertical grid marks.) Again, PNW, net of hydro, is Summer Peaking, NOT Winter Peaking.

## NOT RESPONDING TO REQUESTED ITEMS IN COMMISSIONERS' PREVIOUS ACKNOWLEDGEMENT LETTER

Further, PSE has not in practice addressed itself to Commissioners questions, which I had extracted from Commissioner's letter and sent to Mr. Popoff, asking that these Commissioners' questions and requests actually be addressed. Mr. Popoff acknowledge this email, thanked me, and then prevented me from attending IRP meetings. I include the questions and issues that Commissioners themselves asked of PSE attached below. When I told PSE at the original IRP planning meetings that I simply asked that they actually address Commissioners' requests in this IRP cycle, PSE responded by preventing me from participating in many of the “public participation is essential” meetings. PSE responded by "freezing me out" of the "Technical Advisory Group" meetings – I am an electrical engineer – graduate of MIT, with 20 years of



industry experience in statistical modeling. I am certainly technically qualified to go to any of their “Technical” meetings! PSE previously "froze out" the lawyer for Industrial Customers, when she in turn complained that PSE is Overbuilding and thereby Overcharging. This is not about “Technical” and who should be allowed to go to “Technical” meetings. Rather, this is about PSE systematically “Freezing Out” *anyone* who complains about PSE’s Overbuilding and resulting Overcharging.

## “ENERGIZE EASTSIDE” TRANSMISSION PROJECT OVERLY DESTRUCTIVE TO RESIDENTIAL NEIGHBORHOODS

Again, I complain of PSE’s continued refusal to include discussion of transmission lines in IRP planning even though they are clearly covered in the IRP requirements. PSE has unfairly and unreasonably discriminated against residential ratepayers by ignoring their own linear routing study “Keep Out” distance for residential homes – while respecting that “Keep Out” distance for used car lots! PSE is concerned about placing 220,000 Volt power lines too near to used cars – but they are not concerned about placing 220,000 Volt power lines right on top of a natural gas pipe line, with small children sleeping in their bedroom almost directly under those 220,000 Volt power lines??? Again, Transmission Projects such as “Energize Eastside” need to be part of the IRP public planning process.

## REFERENCING INCLUDED DATA MATERIALS

Unlike PSE, I have including my work for public inspection in the included CD. I invite anyone interested to review my work. I am happy to show anyone who would like how to independently recreate my work -- unlike PSE who refuses to allow any member of the public to review their work. I am happy to give anyone who wants to use it a copy of my work. Now – please require that PSE do the same – make the dates of the weather days corresponding to their modeled system failures publicly available!

## LIST OF COMMISSIONER'S REQUESTS OF PSE FROM THE PREVIOUS IRP ACKNOWLEDGEMENT LETTER

Improve clarity, transparency and thoroughness.

Refine and integrate new types of analysis into the IRP, of which, the "operational flexibility" analysis performed in the 2013 cycle is an example.

Clarify whether or not there is sufficient interruptible natural gas pipeline capacity -- with oil backup.

Make sure the analysis of the availability of gas-for-power includes interaction with the operational flexibility analysis and a clear connection to the gas storage resources selected in the Plan.

Disaggregate Colstrip analysis, analyzing possible closures of Units 1&2, vs. 3&4 separately.

Provide better explanation and justification for load growth analysis.

Include potential impacts from DG in load forecasts.

Include capacity available from interruptible customers in load forecasts.

"Limiting participation by failing to respond to reasonable requests for information is unacceptable." – I note PSE has refused my request to participate in their "Technical" IRP meetings, and has refused to provide me with the model "weather" dates on which their system modeling failed (those historical dates where their modeling showed additional Peaker(s) would have been necessary.)

"PSE should improve the transparency of its planning margin analysis. In the 2015 IRP, the Company should develop a process to allow stakeholders to better understand the assumptions, the analysis, and the results of the company's planning margin." – on the contrary PSE prevented this Electrical Engineer from participating in the "Technical" meetings.

Address the possibility that the Company's supply-side analysis overall relies too heavily on one particular type of technology, namely single-cycle gas peakers.

Provide more detailed analysis on a broader range of alternatives to peakers in the next IRP. – alternatives should have included contracts with BPA, and the option of Wind-Integration contracts with BPA.

Provide sufficient analysis to show that its peak load will become more extreme over time. – on the contrary, PSE is ignoring how climate change has made peak load less extreme over time.

Demonstrate that the build-out of peakers is not, in fact, being used to meet the need of slowly increasing load. – or sales to Californians via the Cal Energy Imbalance Market.

Quantify and validate assumptions regarding each resource's operational and performance characteristics.

Quantify the amount of interruptible gas capacity used by peakers in the model, and provide the details for assuming that this capacity will be available when needed.

Explain how changes in the load ratio (peak to base) affect the relative economics of different types of generation resources. – on the contrary PSE is ignoring how climate change is making coldest winter days more mild, reducing the load ratio.

Provide more detailed justification for any assumptions or inputs into the load forecasting model.

Update energy storage analysis with recent market data, clarify its assumptions regarding expected operational conditions for storage systems, and include ancillary services in the energy storage analysis, relying on a wide variety of national and state data, especially those available on the California storage market.

Specify the operating and performance characteristics it prioritizes for energy storage technologies prior to issuing its next RFP.

Improve the usefulness of its conservation potential assessment by modeling demand response as a resource separate from energy efficiency.

Include a cost of CO<sub>2</sub> that include the costs on ratepayers and society in general. – On the contrary, Real climate scientists are currently estimating CO<sub>2</sub> costs of about \$100/ton – much higher than PSE is including in their “High” CO<sub>2</sub> modeling.

Model the transmission constraints present in its system and the impact those constraints have on resource selection.

Explicitly describe the relationship between the infrastructure and IRP planning processes.

"Commission expects the Company to provide written responses to all Advisory Group questions submitted to the Company in writing" -- I note that Mr. Popoff has repeatedly refused to provide written responses to my questions submitted in writing.

Provide minutes for each Advisory Group meeting. – on the contrary PSE provided meeting notes which falsely claimed that I had agreed to be excluded from their “Technical” meetings.

Work with stakeholders to develop a reasonable set of input assumptions and reasonable set of results in a format that will be useful for stakeholders.

Make full use of existing provisions to manage confidential information.

Analyze the relative additional necessity of additional Mist storage in conjunction with the LNG and Swarr resources.

Conduct a second run of its model once the appropriate blocks of pipeline capacity are selected, to assess whether early acquisition of pipeline blocks impacts the timing of the selection of other resources.