BEFORE THE CORPORATION COMMISSION OF THE STATE OF OKLAHOMA

IN THE MATTER OF THE APPLICATION OF PUBLIC SERVICE COMPANY OF OKLAHOMA FOR APPROVAL OF ENERGY EFFICIENCY AND DEMAND RESPONSE PROGRAMS; FOR APPROVAL OF THE RECOVERY OF ALL DEMAND PROGRAM COSTS, LOST NET REVENUES AND A SHARED SAVINGS INCENTIVE; FOR A COMMISSION WAIVER OF OAC 165:35-41-4(b)(7) TO EXTEND THE IMPLEMENTATION SCHEDULE TO FIVE-YEARS AND FOR A LIMITED WAIVER OF OAC 165:35-41-4(b)(5) FOR HEAT PUMP TECHNOLOGY; AND AUTHORIZING THE CONTINUED USE OF THE DEMAND SIDE MANAGEMENT COST RECOVERY RIDER.	)	CAUSE NO. PUD 202100041

OKLAHOMA SUSTAINABILITY NETWORK'S STATEMENT OF POSITION

Pursuant to the Scheduling Order issued in this Cause, Oklahoma Sustainability Network (OSN) hereby files the attached Statement of Position the above-captioned Cause.

Respectfully submitted,

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OSN serves to connect and educate the people of Oklahoma concerning the many aspects of sustainability and to contribute practical ideas that link a prosperous economy with a healthy environment and thriving Oklahoma communities.

OSN participated in the original Demand Programs rulemaking in 2008 and again in the 2013 rulemaking update, and OSN has an established history of reviewing and supporting cost-effective energy efficiency programs, including as a party in each of Public Service Company of Oklahoma's (PSO's) previous Demand Portfolio proposals. OSN has attended every PSO stakeholder meeting and has closely reviewed every annual Evaluation, Measurement & Verification (EM&V) report. OSN also monitors best practices and innovations in program design and implementation, reviews industry reports, and maintains frequent communication with efficiency program experts across the country.

OSN notes PSO's steady year-by-year progress on reducing customer energy usage and peak demand while staying on budget, updating and expanding their programs, and successfully adapting to the serious challenge of the COVID-19 pandemic. OSN has carefully reviewed the application, testimony, and discovery responses provided by PSO in this Cause.

1. COST EFFECTIVENESS

PSO's testimony shows that their Demand Portfolio should be cost-effective (C-E) under the primary tests (TRC and UCT), but OSN notes that the portfolio is likely in practice to be even more cost-effective than shown in the testimony. OSN prepared the table below comparing projected cost-effectiveness results with actual reported cost-effectiveness results from 2018-2020 Annual Reports.

	TRC – Projected [1]	**TRC – Reported** [2]	UCT/PAT – Projected	**UCT/PAT – Reported**
2018	1.51	**2.77**	2.07	**3.09**
2019	1.51	**2.58**	1.73	**3.06**
2020	1.51	**2.47**	1.73	**2.50**
2021	1.51	**-**	1.73	**-**
2022-2026[3]	1.38		1.58	

OSN notes that while PSO's projections for the 2022-2026 portfolio are slightly lower, it is likely that the results will still be well above 2. Any result above 1 would be a cost-effective deployment of customer resources.

[1] Projection for 2018 from Direct Testimony of Sasha Baroiant, Cause #2015-00244, p 37, Table 6; Projections for 2019-2021 from Direct Testimony of Sasha Baroiant, Cause #2018-00073, p 46, Table 5.
[2] 2018 Annual Report, page B-3, Table B-2; 2019 Annual Report, page B-4, Table B-2; 2020 Annual Report, page B-4, Table B-2. Additional tests (RIM, SCT, PCT) reported in Tables 1-5.
[3] Direct Testimony of Sasha Baroiant, p 46, Table 5.

EPA's publication, "Understanding Cost-Effectiveness of Energy Efficiency Programs: Best Practices, Technical Methods, and Emerging Issues for Policy-Makers" (cited by PSO witness Sasha Baroiant on page 11 of his Direct Testimony), includes an important description of the TRC test: "Benefits and costs from the perspective of all utility customers (participants and nonparticipants) in the utility service territory." [4]

But OSN also notes that PSO's projected cost-effectiveness calculations exclude a number of important benefits and avoided costs that provide *even more value* to PSO and its customers. The avoided risk benefits associated with energy efficiency investments are considerable:

- No risk of stranded assets in the future;
- No transmission lines, no interconnection costs, no congestion or curtailment risks;
- No risk of construction delays or cost overruns;
- No rail lines for fuel;
- No pipeline costs;
- No eminent domain battles;
- No water supply risks or wastewater disposal issues;
- No tax credit debates; and
- Not subject to future EPA rules or compliance.

None of these avoided risks are specifically quantified or monetized in the cost-effectiveness tests, but these benefits are real and they accrue to all customers - participants and non-participants.

EPA also points to another significant Non-Energy Benefit (NEB) of energy efficiency programs: lower arrearages. "From the utility perspective, NEBs have been shown to reduce the number of shut-off notices issued or bill complaints received, particularly in low-income communities."[5] PSO's response to Data Request OSN 2-8 shows that 68,436 residential accounts, or 14.1%, were in delinquency as of April 2021. As noted by PSO, this figure does not even include any balances that are deferred on payment arrangements.

There are other significant NEBs associated with EE programs, including reduced emissions of criteria pollutants or ozone precursors and reduced air toxics (including mercury). OSN notes that NEBs - sometimes referred to as "externalities" - have significant *public interest* value. Some states, including Colorado, Idaho, Utah, Washington, and Minnesota require an "adder" in the benefits calculations to capture this value.[6] In Oklahoma, CenterPoint Energy includes an "Environmental Damage Factor" in its cost-effectiveness calculations for their Demand Portfolio.[7]

[4] *"Understanding Cost-Effectiveness of Energy Efficiency Programs: Best Practices, Technical Methods, and Emerging Issues for Policy-Makers*" - Environmental Protection Agency, November 2008, Table 3-1 - https://www.epa.gov/sites/production/files/2015-08/documents/cost-effectiveness.pdf
[5] ibid, p 4-10.
[6] See ACEEE's "Everyone Benefits" for a helpful discussion of NEBs.
[7] CenterPoint 2019-00060, Laboy Direct Exhibits, p. 59, Input 9.
http://imaging.occeweb.com/AP/CaseFiles/occ30270050.pdf

The public interest value of these air quality benefits is considerable. EPA's updated "Public Health Benefits per kWh" report (May 2021) calculates a range of 1.3 - 3.09 ¢/kWh: [8]

Table ES-1. 2019 Benefits-per-kWh Values (cents

Region	Project Type	3% Discount Rate	
		2019 ¢/kWh (low)	2019 ¢/kWh (high)
California	Uniform EE	0.67	1.51
	EE at Peak	0.74	1.67
	Utility Solar	0.65	1.47
	Distributed Solar	0.64	1.44
	Onshore Wind	0.63	1.41
	Offshore Wind	0.67	1.50
Carolinas	Uniform EE	1.66	3.75
	EE at Peak	1.65	3.73
	Utility Solar	1.69	3.80
	Distributed Solar	1.69	3.81
	Onshore Wind	1.66	3.75
	Offshore Wind	1.66	3.74
Central	Uniform EE	1.37	3.09
	EE at Peak	1.33	2.99
	Utility Solar	1.34	3.01
	Distributed Solar	1.34	3.02
	Onshore Wind	1.39	3.14

EPA's report includes the following observation: "State and local governments are increasingly interested in quantifying the public health value of emissions reductions from EE/RE so that they can fully reflect these benefits in policy decision-making processes." The report identifies various stakeholders for these benefits-per-kWh screening values, including state and local energy agencies, air quality or public health agencies, and Public Utility Commissions.[9]

PSO included a conservative proxy price for carbon risks (consistent with PSO's 2018 IRP "CO2 dispatch burden") in some of their C-E tests.[10] OSN appreciates PSO's effort to include a benefit value for avoided carbon costs, and OSN also recognizes the challenge of determining a reasonable price for that value. But OSN is less sympathetic with PSO's choice to use 2028 as a commencement date for applying the value - thereby effectively excluding much of its benefit from the average measure life of their proposed portfolio. PSO's current (2019-2021) portfolio used a commencement year of 2022. When asked about

[8] *"Public Health Benefits per kWh of Energy Efficiency and Renewable Energy in the United States: A Technical Report"* – EPA, May 2021, 2nd Edition - https://www.epa.gov/sites/production/files/2021-05/documents/bpk_report_-_second_edition_-_2019.pdf
[9] ibid, p 31.
[10] PSO Response to Data Request OSN 1-2.

their shift from 2022 to 2028, PSO's response simply referred to the advance of time.[11] OSN notes that PSO has advanced the timing by 6 years, not 3. But more importantly, PSO's commencement date ignores the fact that - from a ratepayer, societal, or public interest perspective - climate change and its associated risks and damages are already well underway.[12]

OSN asserts that it would be more reasonable for PSO to use a commencement date of 2022 instead of 2028. This would coincide with the start of the proposed portfolio and would appropriately and prudently reflect the cost-effectiveness and avoided risks of some form of carbon action. PSO's CO2 analysis appears to be focused primarily on the risk of a carbon tax somewhere in the future,[13] but OSN notes that other regulatory or market pressures are possible and maybe even more likely to happen sooner, rather than later, including a Clean Energy Standard, actions by the United States Treasury,[14] commitments under the Paris Agreement, shareholder activism, competitive business pressure,[15] ESG investment priorities,[16] FERC orders, or large-scale public investment and tax credits for renewable energy and battery storage that leave fossil fuel assets uncompetitive.

PSO's DSM programs will displace millions of tons of CO2.[17] Those emissions reductions will make PSO's portfolio even more cost-effective against any requirements for carbon compliance. OSN believes that a ratepayer and public interest perspective on the value of avoided carbon emissions is crucial and prudent for evaluating the benefits of DSM programs starting in 2022, not at some future date.

2. DEMAND PROGRAMS AND FEBRUARY 2021 STORM EVENT

The effect of the February 2021 winter storm event on Oklahoma's power resources - and the extraordinary costs associated with it - has been discussed almost entirely as a supply-side failure, but it was also driven by sustained high demand for energy, with much of that high demand being driven by residential heating load.[18] OSN notes that PSO and other utilities issued multiple appeals for energy conservation in response to SPP's Energy Emergency Alert Levels.[19] Supply-side solutions to the event will take time to implement, if they are implemented at all.

PSO indicates that nearly all of its proposed programs and measures will reduce winter peak loads and winter energy usage, and they are developing options to utilize the demand response programs outside of the familiar summer peaking season.[20] This is a significant opportunity for demand savings. PSO's

[11] PSO Responses to Data Request OSN 1-5a & b.
[12] *NOAA Delivers New U.S. Climate Normals* - https://www.ncei.noaa.gov/news/noaa-delivers-new-us-climate-normals
Climate Change Indicators in the United States - https://www.epa.gov/climate-indicators#discover
[13] PSO Response to Data Request OSN 1-8a.
[14] *Remarks by Secretary of the Treasury Janet L. Yellen addressing the threat of climate change* - *https://home.treasury.gov/news/press-releases/jy0104*
[15] "Businesses & Investors Call for Ambitious U.S. NDC" - Includes multiple businesses with operations in Oklahoma. https://www.wemeanbusinesscoalition.org/ambitious-u-s-2030-ndc/
Google's 24/7 carbon-free energy goal - https://blog.google/outreach-initiatives/sustainability/new-progress-toward-our-247-carbon-free-energy-goal/
[16] "World's largest money manager says sustainable investing surge to continue" - https://www.cnbc.com/2021/01/26/blackrock-calls-for-climate-change-disclosure-expects-sustainable-investing-to-continue.html
[17] PSO 2020 Energy Efficiency & Demand Response Programs: Annual Report, Table 2-3.
[18] PSO Response to Data Request OSN 2-1b & e.
[19] PSO Response to Data Request OSN 2-1d.
[20] PSO Response to Data Request OSN 2-1f.

response to OSN's Data Request 2-6 shows that approximately 21% of PSO's residential customers have electric space heating, and 44% of PSO's residential customers have electric water heating. But PSO makes the important point that overall BTU demand reduction would be accomplished for participants with either electric or non-electric heating.[21]

OSN supports PSO's efforts to expand demand response options to accommodate other connected devices into the Direct Load Control component of Power Hours. OSN also supports PSO's proposal for a limited waiver of OAC 165:35-41-4(b)(5) to enable customers to choose the highest efficiency heat pump technology.

New Homes Program

PSO's response to Data Request OSN 2-11 shows that the New Homes component of the current Home Rebates program is over-subscribed to the point that the entire budget for 2021 was exhausted by March 31st. It is likely that PSO will have to transfer funds from another area of the budget to avoid closing down this prominent and successful program. OSN notes that Oklahoma has one of the lowest-efficiency residential building codes in the nation;[22] incentives for high-efficiency construction are at least a partial remedy for this. OSN recommends that PSO's proposed $750,642 annual budget for New Homes should be returned to its actual 2020 spending level of $1,715,450.[23]

Recommendation

Given the extreme costs of the winter weather event and the imperative to help avoid a repetition of it, OSN supports an increase in funding for PSO's Residential Energy Services programs to help customers invest in better insulated homes and purchase the highest-efficiency appliances.

3. HOME WEATHERIZATION

From frozen pipes and expensive plumbing repairs to many years ahead of higher monthly bills for extraordinary fuel cost recovery, PSO's limited-income customers are living with an energy burden that will now be even higher as a result of the 2021 winter storm event. PSO proposes to reach only 1,763 participants per year with their well-established and proven Home Weatherization program,[24] but they have identified 229,196 eligible PSO customers.[25]

[21] PSO Response to Data Request OSN 2-1g.
[22] *2020 State Energy Efficiency Scorecard*, ACEEE, p 84, Table 26 - https://www.aceee.org/sites/default/files/pdfs/u2011.pdf
[23] PSO Response to Data Request OSN 2-10, Attachment 1.
[24] Direct Testimony of Sasha Baroiant, Exhibit SB-02, Table 4.
[25] PSO Response to Data Request OSN 2-3.

Clearly there is room - and need - to expand the home weatherization program, and fortunately it is also a cost-effective opportunity. OSN assembled the following table showing projected and reported cost effectiveness ratios for the weatherization program since 2018:

	TRC – Projected [26]	**TRC – Reported [27]**	UCT/PAT – Projected	**UCT/PAT – Reported**
2018	1.62	**2.50**	1.10	**1.66**
2019	1.58	**2.25**	1.01	**1.55**
2020	1.58	**2.87**	1.01	**1.97**
2021	1.58	**-**	1.01	**-**
2022-2026	1.17		0.78	

OSN notes that PSO's proposed Home Weatherization budget of $3,447,989 average per year represents 22.3% of their Residential Sector portfolio budget ($15,448,993/yr) - but 47.4% of their 483,536 Residential customers are eligible for the program.[28] OAC 165:35-41-4(b)(10) states, "Demand Portfolios shall: Address programs for low-income customers and hard-to-reach customers to assure proportionate Demand Programs are deployed in these customer groups."

OSN recommends that PSO target additional participants, but OSN also notes that there likely is potential for deeper savings per participant. Specific incremental incentives for replacement of the oldest, most inefficient appliances, for example, could be added as a measure. ACEEE made the following observation in a 2017 report:

> Many programs have room to provide additional best practice measures, such as water efficiency and appliance upgrades. Approximately 65% of the electric programs and 52% of the natural gas programs in this study included appliance upgrades as an offered program measure. Because low-income households are more likely to have older appliances, appliance upgrades have the potential for greater energy savings for these customers.[29]

OSN strongly supports PSO's proposed addition of heat pump water heaters as a new measure for the program.[30]

OSN also recommends that PSO increase their marketing for the program. ACEEE has pointed out that low-income customers tend to be less aware of efficiency programs than non-low-income customers.[31] Anecdotally, OSN still encounters customers (and even city leaders) who are unaware that the program exists.

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[26] Projections from Direct Testimonies of Sasha Baroiant - Cause #2015-00244, p 37, Table 6; and Cause #2018-00073, p 46, Table 5.
[27] 2018 Annual Report, page B-3, Table B-2; 2019 Annual Report, page B-4, Table B-2; 2020 Annual Report, page B-4, Table B-2.
[28] https://www.psoklahoma.com/lib/docs/company/about/PSOFactSheet2021.pdf - 229,196 / 483,536 = 47.4
[29] *Low-Income Energy Efficiency Programs: A Baseline Assessment of Programs in the 51 Largest Cities*, ACEEE, 2017 - p 22, 2nd para. https://www.aceee.org/sites/default/files/low-income-baseline-1117.pdf
[30] Direct Testimony of Sasha Baroiant, Exhibit SB-02, p 4.
[31] *Making a Difference: Strategies for Successful Low-Income Energy Efficiency Programs*, ACEEE, 2017 - p 8, 2nd para. https://www.aceee.org/sites/default/files/publications/researchreports/u1713.pdf

Expanding the Home Weatherization program and budget should not be at the expense of PSO's other cost-effective programs. *OSN recommends that Home Weatherization should be separated from the spending cap and allowed to stand on its own merits.*

OVERALL RECOMMENDATIONS

Cost-effective, low-risk energy efficiency programs are the best bargain that PSO can offer to Oklahoma customers, and it is the best investment for reducing customers' exposure to fuel costs and other supply-side shocks. OSN respectfully requests that the Commission approve PSO's demand programs along with the following recommendations:

1. Approve PSO's proposal for a limited waiver of OAC 165:35-41-4(b)(5) to enable customers to choose the highest efficiency heat pump technology.
2. Remove the Home Weatherization program from under the spending cap and make it a stand-alone program.
3. Increase the Home Weatherization budget to $6,895,978 to reach more eligible customers and achieve deeper savings.
4. Stay below the spending cap for the remaining programs, but increase the budgets for the following:
   - Residential Energy Services, including a return to previous spending level of $1,715,450 for New Homes and additional amounts for other components of Home Rebates;
   - Multi-Family Channel; and
   - Business Rebates.

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PUBLIC SERVICE COMPANY OF OKLAHOMA'S RESPONSE TO OKLAHOMA SUSTAINABILITY NETWORK'S FIRST SET OF DATA REQUESTS

Question No. OSN 1-2:

Please provide the approximate date for when the CO2 avoided costs and commencement year for this portfolio were determined or formulated and by whom. Provide any supporting documentation.

Response No. OSN 1-2:

The base carbon case for the company associated with resource planning activities currently includes a $15/metric ton ($13.21/short ton) carbon price beginning in 2028. These are consistent assumption as discussed in AEP's "Climate Impact Analysis" report (2028 and $15/ meteric ton + 3.5% per year). As stated in OSN 1-1, the originally filed Exhibit SB-01 incorrectly identifies 2030 as the commencement year. Please see filed Errata SB-01, which contains amended Exhibit SB-01.

Witness: Jeffrey E. Brown — Title: EE & Consumer Programs Mgr

Witness: Kimete Seferi — Title: Regulatory Consultant

Date Response Provided: 5/3/2021

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PUBLIC SERVICE COMPANY OF OKLAHOMA'S RESPONSE TO OKLAHOMA SUSTAINABILITY NETWORK'S FIRST SET OF DATA REQUESTS

Question No. OSN 1-5:

For the previous Demand Programs portfolio (2019-2021), PSO used a CO2 avoided cost commencement date of 2022.
(a) Please explain why PSO now is utilizing a much later commencement date (either 2030 or 2028).
(b) Does PSO believe that the risk of carbon regulation or climate change impact is lower now than it was for the 2018 Demand Programs filing? Please explain.

Response No. OSN 1-5:

a) The later start date of the CO2 avoided cost is reflective of the fact that several years have now passed since the 2018 filing without substantial federal action on carbon pricing or regulation. For carbon pricing to be realized consensus on regulation/policy will be needed as well as appropriate lead time for compliance.
b) PSO does not believe the risk is lower. Per (a) the shift in timing is largely attributed to the passage of time.

Witness: Jeffrey E. Brown — Title: EE & Consumer Programs Mgr

Witness: Kimete Seferi — Title: Regulatory Consultant

Date Response Provided: 5/3/2021

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PUBLIC SERVICE COMPANY OF OKLAHOMA'S RESPONSE TO OKLAHOMA SUSTAINABILITY NETWORK'S FIRST SET OF DATA REQUESTS

Question No. OSN 1-8:

PSO has included Avoided Greenhouse Gas Costs as a benefit under the Total Resource Cost Test and the Societal Test, but it is not included as a benefit under the Program Administrator / Utility Cost Test or the Ratepayer Impact Measure Test (See Baroiant Direct Testimony, page 17, Table 1). Avoided purchased capacity costs are included as a benefit under each of the tests except the Participant test.
(a) Does PSO assume that additional purchased capacity costs will be only from non-carbon emitting sources?
(b) Does PSO's calculation of avoided purchased capacity costs include a factor, adjustment, or sensitivity for avoided Greenhouse Gas costs or carbon regulatory risk?
(c) Does PSO believe that purchased capacity faces no risks from, for example, Clean Air Act regulation, carbon pricing initiatives, Clean Energy Standards, actions by the United States Treasury, the United States rejoining the Paris Agreement, or shareholder pressure?
(d) Does PSO believe that the retail rates of non-participating ratepayers (i.e., RIM Test) are not at risk from any of these factors?

Response No. OSN 1-8:

a) No. For instance, the 2018 PSO IRP, section 6.0 outlines PSO's Preferred Plan to include a combination of resources including both carbon and non-carbon emitting.
b) No. Not in avoided capacity costs. However, carbon taxes are reflected in avoided generation costs for the reasons OSN cited in parts c and d of this question. Therefore, avoided GHG costs are not explicitly included in PACT and RIM tests, to avoid double counting the associated financial benefits to ratepayers. TRC and Societal tests also include avoided GHG also as a non-energy benefit. We used the carbon tax as a proxy to estimate the value of this benefit. In retrospect I should have worded the term 'Avoided Greenhouse Gas Costs" as "Benefits from Avoided Greenhouse Gasses", as the term "costs" can be linked to taxes, which are embedded in utility avoided costs.
c) No. There is uncertainty in the timing and magnitude of such actions thus for instance in the 2018 PSO IRP, section 5.4 Risk Analysis, is an assessment of risk of assets.

d) No, all customers are "at-risk", thus PSO resource plan has taking a diversified approach including energy efficiency, renewables and natural gas as defined in the IRP.

Witness: Jeffrey E. Brown — Title: EE & Consumer Programs Mgr

Witness: Sasha Baroiant — Title: Director, ADM Associates, Inc.

Date Response Provided: 5/3/2021

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PUBLIC SERVICE COMPANY OF OKLAHOMA'S RESPONSE TO OKLAHOMA SUSTAINABILITY NETWORK'S SECOND SET OF DATA REQUESTS

Question No. OSN 2-1:

In Exhibit SB-05: Business Demand Response, pp. 1-2, section 6, witness Baroiant refers to the February 2021 storm event: "Recent widespread grid impacts from the Texas Winter Storm of February 2021 have compelled PSO to consider calling curtailment events outside of the typical summer program window. PSO will offer a year-round participation mode for customers that are willing and able to shed loads if needed to do so at any time of the year." (a) Please provide any demand-side analysis of the February 2021 winter weather event. For example, please provide the amount of PSO's load reduction required by SPP during the Energy Emergency Alert Level 3 events on 2/15 and 2/16 and provide 10-year historical comparison of normal February peak power demand versus February 2021. (b) If demand was higher than normal, what percentage of this higher demand was from electric heating loads? (c) If precise data is not available, please provide estimates and/or other insight. (d) Please provide any examples of PSO's public appeals for conservation issued during the February winter weather event. (e) Does PSO agree that the adverse impacts and costs of the February winter weather event were partially driven by sustained high energy usage? (f) Please identify which of the proposed demand programs and measures (including R&D) would reduce winter peak loads and winter energy usage. (g) Could PSO's proposed Direct Load Control component of Power Hours (described at Baroiant Direct, Exhibit SB-7, p. 1) be utilized for winter curtailment events? (h) Will the proposed "bring your own device" component include incentives for the purchase of Smart water heaters equipped with CTA-2045-compliant ports, which would allow scheduled heating and basic demand response control? (i) Could higher-value curtailment incentives be developed for emergency situations, such as SPP's February 2021 Levels 1-3 alerts? Please discuss. (j) Could the "Demand Management Integrated Resources" R&D component, including home battery systems and EV chargers for residential customers, described at page 32 of Sasha Baroiant's testimony, be utilized for adverse winter weather load events?

Response No. OSN 2-1:

(a) The amount of PSO's load reduction required by SPP during the Energy Emergency Alert Level 3 events on 2/15 and 2/16 are shown in OSN 2-1 Attachment 1.
Please see OSN 2-1 Attachment 2 displaying the February 2021 winter event impact on industrial load.

Please see OSN 2-1 Attachment 3 showing the actual and weather normalized peak demand for winter and February peaks over the last 10 years.
(b) PSO is not aware of a study of the end-use(s) that caused the higher demand. However, given the weather conditions and decrease of industrial load as shown in (a), electric heating and fan loads is likely a primary driver.
(c) Please see the response to (b).
(d) Please see OSN 2-1 Attachments 4, 5 and 6 of news press releases made during the event. PSO used other means of appeals including dialers, social media, etc.
(e) Yes
(f) Witness Baroiant's Exhibit SB-01, pages 3 – 80, provide the proposed measures by program. All the proposed demand programs and most all measures will reduce winter peak loads and winter energy usage. The primary exceptions would be high efficient air conditioners, pool pumps, and agriculture irrigation pumping motors. The winter peak hours as shown in OSN 2-1 Attachment 3, are generally late morning or late evening. Therefore, measures improving the envelope of homes or businesses reduce energy and demand year round. Similarly, residential and outdoor lighting use is greatest in the evenings and early mornings.
PSO's proposed limited waiver for heat pump technology will add electric load yet due to the high efficiency of heat pumps the overall energy (in BTUs) will be reduced. Therefore, providing reduced demand to the overall delivery of energy, both fossil fuels and renewables.
PSO's proposed R&D are proposed to reduce winter peak through storage (batteries and smart water heating) and both winter peak energy use through net zero energy homes, non-wires alternatives and virtual diagnostic tools to assist identifying abnormally high users.
PSO is proposing to expand the demand response programs to go beyond the typical historic summer peaking event season. PSO's R&D proposes to research load management opportunities that can be utilized year round.
(g) Yes, given the recent February weather event, PSO plans to pursue options for utilizing demand response programs to reduce energy demand outside the traditional PSO summer peak season. The Direct Load Control component of Power Hours does have the technological potential to curtail heating and ventilation loads in winter. The electric load curtailment potential for a winter event would be far lower than in summer, however, since most participants have non-electric heating. However, overall BTU demand reduction would be accomplished for participants with either electric and non-electric heating.
(h) The exact control or communications measures for the bring your own device have not been determined. PSO will attempt to accommodate a variety customer smart devices where cost effective.
(i) Higher-value curtailment incentives may be possible where the utility has total control of the energy consuming or delivery device. However, PSO has generally pursued less controlling practices and more customer-friendly, voluntary demand response or load management programs where customers have opportunities to opt out of events. PSO has generally experienced low event opt out rates.
Load management or demand response programs attempt to avoid the utility system in getting to an emergency situation.
(j) Yes, home battery systems and EV chargers may be utilized for adverse winter weather load events.

Witness: Jeffrey E. Brown Title: EE & Consumer Programs Mgr

Date Response Provided: 5/14/2021

BEFORE THE CORPORATION COMMISSION OF THE STATE OF OKLAHOMA

IN THE MATTER OF THE APPLICATION OF PUBLIC SERVICE COMPANY OF OKLAHOMA FOR APPROVAL OF ENERGY EFFICIENCY AND DEMAND RESPONSE PROGRAMS; FOR APPROVAL OF THE RECOVERY OF ALL DEMAND PROGRAM COSTS, LOST NET REVENUES AND A SHARED SAVINGS INCENTIVE; FOR A COMMISSION WAIVER OF OAC 165:35-41-4(b)(7) TO EXTEND THE IMPLEMENTATION SCHEDULE TO FIVE-YEARS AND FOR A LIMITED WAIVER OF OAC 165:35-41-4(b)(5) FOR HEAT PUMP TECHNOLOGY; AND AUTHORIZING THE CONTINUED USE OF THE DEMAND SIDE MANAGEMENT COST RECOVERY RIDER.	)	CAUSE NO. PUD 202100041

PUBLIC SERVICE COMPANY OF OKLAHOMA'S RESPONSE TO OKLAHOMA SUSTAINABILITY NETWORK'S SECOND SET OF DATA REQUESTS

Question No. OSN 2-3:

In Exhibit SB-02, Section 3, pages 2-3, witness Sasha Baroiant provides eligibility guidelines for the Home Weatherization program. (a) Please provide an estimate of the number of PSO customers or households eligible under these guidelines for the Home Weatherization program. (b) Is this number increasing, or decreasing, from previous years? Please explain.

Response No. OSN 2-3:

(a) The listed eligibility guideline of households with incomes less than $50,000 is the most restrictive. Based on the percentage of 2019 Oklahoma households with incomes under $50,000 as determined by the American Community Survey for Oklahoma multiplied by PSO's 2020 residential customer count yields 229,196 eligible PSO customers.
(b) The annual household income for a household of 4 at or below 200% of federal poverty guidelines has increased since PSO's 2019-2021 Demand Portfolio filing from $50,200 to $52,400. The proposed households earning less than $50,000 per year is the same as the previous filing. However as stated in Exhibit SB-02, PSO will monitor participation rates and inflation and adjust accordingly with stakeholder notification.

Witness: Jeffrey E. Brown Title: EE & Consumer Programs Mgr

Date Response Provided: 5/14/2021

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IN THE MATTER OF THE APPLICATION OF PUBLIC SERVICE COMPANY OF OKLAHOMA FOR APPROVAL OF ENERGY EFFICIENCY AND DEMAND RESPONSE PROGRAMS; FOR APPROVAL OF THE RECOVERY OF ALL DEMAND PROGRAM COSTS, LOST NET REVENUES AND A SHARED SAVINGS INCENTIVE; FOR A COMMISSION WAIVER OF OAC 165:35-41-4(b)(7) TO EXTEND THE IMPLEMENTATION SCHEDULE TO FIVE-YEARS AND FOR A LIMITED WAIVER OF OAC 165:35-41-4(b)(5) FOR HEAT PUMP TECHNOLOGY; AND AUTHORIZING THE CONTINUED USE OF THE DEMAND SIDE MANAGEMENT COST RECOVERY RIDER.	)	CAUSE NO. PUD 202100041

PUBLIC SERVICE COMPANY OF OKLAHOMA'S RESPONSE TO OKLAHOMA SUSTAINABILITY NETWORK'S SECOND SET OF DATA REQUESTS

Question No. OSN 2-6:

On page 26 at line 11 (and footnote), PSO witness Baroiant discusses a ceiling insulation measure and he notes the higher prevalence of electric space heating in the multifamily sector. (a) What percentage of PSO's non opt-out customers use electric space heating? (b) What percentage of PSO's non opt-out customers use electric water heating?

Response No. OSN 2-6:

To develop estimates for the percentages of customers that use electric space and water heating, I combined data from an end-use level forecast provided by Cadmus for an energy efficiency potential study in 2015, PSO's estimated residential per-customer annual energy usage, and typical heating and water heating energy usages. The percentage of customers with a given end use are estimated by the following formula:

Percent_x = Forecast_Energy_Usage_x ÷ Number_of_Accounts ÷ Annual_Energy_Usage_x

Terms in the above equation are defined below:

Percent_x indicates the percentage of households with a given type of equipment represented by the variable ***x***. For example, central heat pumps or electric resistance water heaters.

Forecast_Energy_Usage_x indicates the total annual energy consumption among PSO's residential customers in year 2020 for the equipment represented by **x**, as forecast by PSO (in 2015).

Number_of_Accounts is the number of residential accounts, as estimated by dividing the total forecast electric energy usage in 2020 by the typical annual electric energy consumption. The potential study forecast 6,247,707,510 kWh energy usage in its residential sector. The current estimate for average annual energy usage for residential customers is 13,020 kWh (as provided by witness Earlyne Reynolds). The ratio of the two numbers is 480,623 residential accounts. Although the end-use level forecast is from 2015, the value is in good agreement with actual observed residential sales at in recent years.

Annual_Energy_Usage_x indicates the estimated annual energy consumption for a given equipment, as calculated by technical reference manuals such as the Oklahoma Deemed Savings Documents and the Arkansas Technical Reference Manual. In addition to these documents, I estimated typical capacities and efficiencies for heating and cooling equipment in PSO's service territory. These estimates are informed

by program evaluation data and represent averages over single-family and multi-family sectors. Importantly, I used typical capacities at the household level so that the resulting Percent_x is the percent of homes with the attribute x, rather than a saturation value for the equipment represented by x. Results from the above calculation are shown in Table 1 below.

Table 1 – Percentages of households with given attributes

Attribute	**Percent of Homes**
Central Cooling	80%
Room Cooling	9%
Central Heat Pumps	2%
Total Homes with Air Conditioning	*90%*
Central Heating (Non-Electric Furnace)	78.5%
Electric Heating (Central and Room)	19.8%
Total Homes with Electric Heating	*21.3%*
Total Homes with Heating	99.8%
Electric Water Heating	*44%*

Based on the above calculation we provide the following responses:

a. Approximately 21% of PSO's residential customers have electric space heating.
b. Approximately 44% of PSO's residential customers have electric water heating.

Witness: Sasha Baroiant Title: Director, ADM Associates, Inc.

Date Response Provided: 5/14/2021

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PUBLIC SERVICE COMPANY OF OKLAHOMA'S RESPONSE TO OKLAHOMA SUSTAINABILITY NETWORK'S SECOND SET OF DATA REQUESTS

Question No. OSN 2-8:

Please provide the current percentage of PSO's residential customers who are behind on their electric bills. Is this number increasing, or decreasing, since the beginning of 2020?

Response No. OSN 2-8:

Please see OSN 2-7 Attachment 1 that provides PSO's residential delinquency counts and arrears since January 2020. Both values have since declined, but the arrears had risen up to September 2020. The Attachment only contains active residential accounts, so if a customer account closed and charged off, it is not captured here. This also does not count any balances that are deferred on payment arrangements, or customers who have switched to pre-pay.

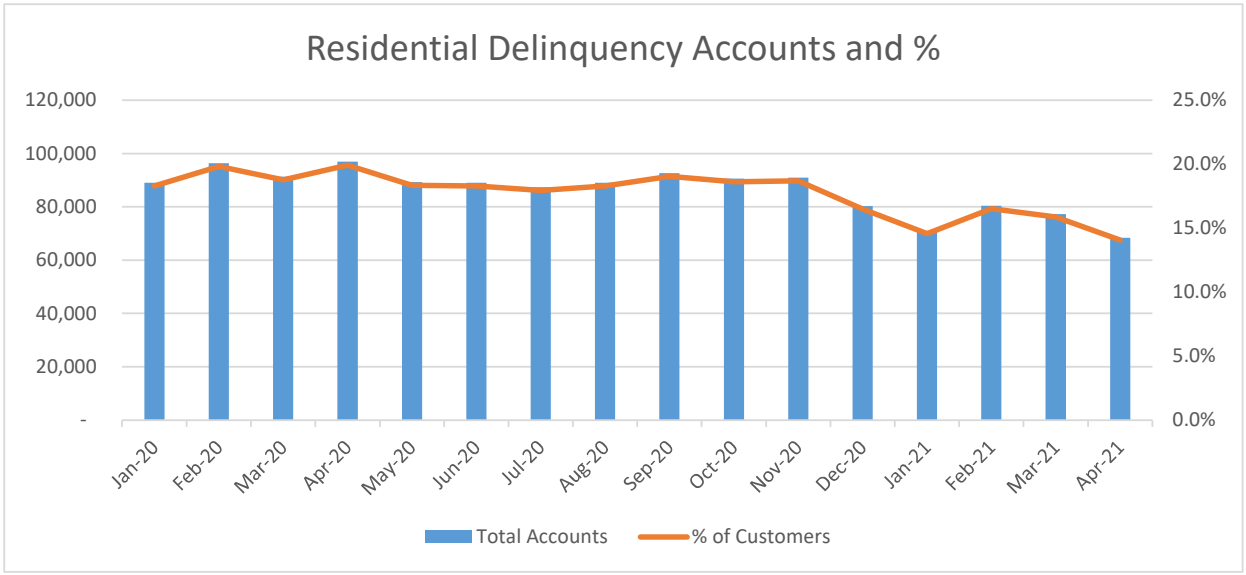
Witness: Jeffrey E. Brown Title: EE & Consumer Programs Mgr

Date Response Provided: 5/14/2021

Residential Delinquency Accounts since January 2020

Month/Year	30-Day Accounts	60-Day Accounts	90-Day Accounts	90+ Accounts	Total Accounts	% of Customers
Jan-20	77,094	9,464	1,440	1,054	89,052	18.3%
Feb-20	84,078	10,081	1,216	1,033	96,408	19.8%
Mar-20	78,772	10,328	1,328	913	91,341	18.8%
Apr-20	68,148	23,245	3,844	1,683	96,920	19.9%
May-20	57,141	18,610	10,252	3,234	89,237	18.3%
Jun-20	56,554	16,140	8,101	8,179	88,974	18.3%
Jul-20	59,687	12,588	5,937	9,169	87,381	18.0%
Aug-20	76,032	8,012	1,876	3,173	89,093	18.3%
Sep-20	78,117	8,901	2,564	3,043	92,625	19.0%
Oct-20	76,883	8,667	2,526	2,484	90,560	18.6%
Nov-20	76,230	9,178	2,589	2,955	90,952	18.7%
Dec-20	65,670	9,217	2,489	2,851	80,227	16.5%
Jan-21	58,310	7,975	1,844	2,826	70,955	14.6%
Feb-21	67,903	8,006	1,711	2,757	80,377	16.5%
Mar-21	64,283	8,980	1,783	2,219	77,265	15.9%
Apr-21	57,953	7,021	1,576	1,886	68,436	14.1%

Residential Customers as of March 2021: 486,566



BEFORE THE CORPORATION COMMISSION OF THE STATE OF OKLAHOMA

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PUBLIC SERVICE COMPANY OF OKLAHOMA'S RESPONSE TO OKLAHOMA SUSTAINABILITY NETWORK'S SECOND SET OF DATA REQUESTS

Question No. OSN 2-10:

Please provide the proposed annual budget for the New Homes component of the Home Rebates channel (Residential Energy Services) and compare it to the annual budgets for 2019-2021.

Response No. OSN 2-10:

Please see OSN 2-10 Attachment 1 comparing the incentives and savings for the 2019-2021 and the proposed 2022-2026 New Homes subprogram.

Witness: Jeffrey E. Brown Title: EE & Consumer Programs Mgr

Date Response Provided: 5/14/2021

New Homes	Incentive Budget	Incentive Spend	% Budget Spent	kWh Savings Goal	kWh Savings Achieved	Number of Homes
2019	$1,344,613	$1,866,050	139%	1,970,000	1,773,720	879
2020	$1,605,000	$1,715,450	107%	1,605,000	1,488,717	848
2021YTD	$1,220,000	$1,095,100	90%	1,195,000	1,228,305	562
2021 YE Est	$1,220,000	$1,620,000	133%			

New Homes	Incentive Budget			kWh Savings		Number of Homes
2022	$750,642			1,246,915		825
2023	$750,642			1,246,915		825
2024	$750,642			1,246,915		825
2025	$750,642			1,246,915		825
2026	$750,642			1,246,915		825

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PUBLIC SERVICE COMPANY OF OKLAHOMA'S RESPONSE TO OKLAHOMA SUSTAINABILITY NETWORK'S SECOND SET OF DATA REQUESTS

Question No. OSN 2-11:

Please provide an update on utilization and budget of the New Homes component for 2021. Is demand for the component increasing or decreasing?

Response No. OSN 2-11:

Please see the response to OSN 2-10, OSN 2-10 Attachment 1 comparing the incentive and savings for the 2019-2021 and the proposed 2022-2026 New Homes subprogram. The attachment includes the 2021 actuals to date and expected at year end. New home construction demand is high. As of March 31, 2021, over 100% of the New Homes budget has been allocated for homes that have or will be complete before year-end.

Witness: Jeffrey E. Brown Title: EE & Consumer Programs Mgr

Date Response Provided: 5/14/2021

CERTIFICATE OF SERVICE

This is to certify that a true and correct copy of the above and foregoing document was delivered via e-mail on the 24th day of May 2021, to the following:

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