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BEFORE THE IDAHO PUBLIC UTILITIES COMMISSION

**IN THE MATTER OF IDAHO
POWER COMPANY'S
APPLICATION FOR APPROVAL
OF SPECIAL CONTRACT AND
TARIFF SCHEDULE 28 TO
PROVIDE ELECTRIC SERVICE TO
MICRON IDAHO
SEMICONDUCTOR
MANUFACTURING (TRITON) LLC.**

CASE NO. IPC-E-24-44

DIRECT TESTIMONY OF COURTNEY WHITE

On Behalf Of

CLEAN ENERGY OPPORTUNITIES FOR IDAHO

Q: Please state your name, business affiliation, and address.

A: Courtney White, Managing Director, Clean Energy Opportunities for Idaho, 3778 N Plantation River Dr Suite 102, Boise, ID 83714.

Q: On whose behalf are you testifying in this proceeding?

A: I am testifying on behalf of Clean Energy Opportunities for Idaho (CEO). The mission of our nonprofit is to bring problem-solving rigor and solution-focused approaches to advance clean energy and better serve the long-term interests of Idahoans and future generations.

Q: Please describe your experience and qualifications.

A: I have a B.E. in Mechanical Engineering from Vanderbilt University and an MBA from Stanford Graduate School of Business. I have been employed in various business fields, including management consulting and operational management. I have held profit-center accountability for operating entities in five countries. I have taught topics related to strategy, change, and innovation at Boise State University as an adjunct professor for twenty years.

I have been engaged in regulatory matters impacting Idaho's transition to clean energy since 2013. I have served as the Managing Director of Clean Energy Opportunities for Idaho since its founding in 2021.

Q: What is the purpose of your testimony, and how is it organized?

A: The purpose of my testimony is to recommend that the rate structure proposed in the IPC-E-24-44 Application (Attachment 2 – Proposed Tariff Schedule 28) should be denied, and that a process should be ordered for modifying the rate structure to more accurately reflect the hourly, time-varying nature of cost causation.¹

¹ Note the Company's statement, "While Idaho Power does not believe TOU pricing is necessary in this case, the Company would not oppose such an approach if the Commission determined it to be appropriate." IPC-E-24-44, Idaho Power Testimony, Anderson Direct p14.

My testimony focuses on rate structure rather than revenue requirements.

First, my testimony establishes that cost causation varies with time, and that public interest is served by modifying Micron's rate structure to more accurately reflect the costs its new load will cause.

Secondly, I will propose a strawman approach to a time-varying rate structure.

Thirdly, I will address that Micron's load growth is integral to the Company's growing reliance on time-sensitive resources.

Lastly, I will summarize my testimony.

Q: Do you have any exhibits?

A: Yes, I have prepared Exhibit 1 Market Price Averages by Month & Hour.

Q. Is there a linkage between the timing of load and cost causation?

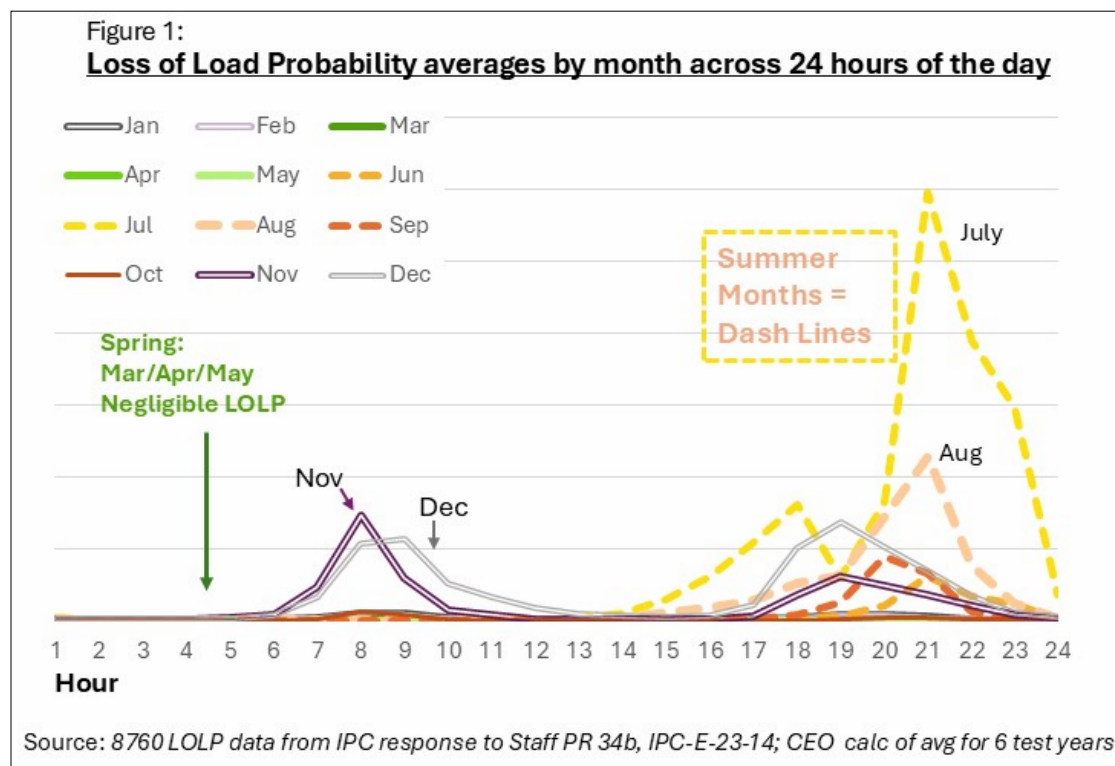
A. Yes. I would posit as a well-established fact that cost causation varies with the timing of load across hours of the day and year.

Regarding energy costs, the Company's current General Rate Case (GRC) utilizes historic market prices (three-year EIM averages) to inform price differentials across different time windows in certain TOU tariffs.² See Exhibit 1 for an illustration of how market prices vary across months of the year and hours of the day.

Regarding capacity costs, the Company's Integrated Resource Planning process demonstrates that Loss of Load risks drive the need for capacity additions. E.g., the Company describes in its 2023 IRP, "In terms of capacity, the hourly LOLP values were used to determine

² IPC-E-25-16, Idaho Power Testimony, Anderson Direct, p25.

the seasons and hours of highest risk for the 2023 IRP.” (Appendix C, p92). These risks vary significantly by month and hour, as illustrated in Figure 1.



Q. How is public interest served by aligning price signals to reflect the time-varying nature of future cost causation?

A. Two independent reasons why price signals reflecting forward-looking cost causation would serve the public interest include:

1. Economic Efficiency. A foundational principle of ratemaking is to provide price signals that promote economically efficient consumption and investment decisions. With increasing levels of solar on the grid, time-varying price signals have become increasingly needed to attract load into hours of ample supply and to charge appropriately for load during hours associated with high risk and high cost. A time-varying rate structure aligns customer financial incentives to evaluate current and future opportunities for controlling when and how

they consume power with choices that mitigate long-term system costs to the benefit of all customers.

2. Fairness. Fairness requires that customers be charged rates that reflect the costs that their usage causes. The Company presents that “Limited Load Flexibility” is a reason why a TOU pricing structure is not appropriate for the Micron FAB.³ The Commission is not in a position to delineate which large load customers will or will not have the potential for cost-effective demand flexibility, particularly given that technologies such as storage will evolve over time. Behind the meter, large customers will choose whether or not to seek opportunities for load shaping and will weigh operational and investment decisions which could impact load shape. These are choices the customer should be able to weigh, now and in the future, based on accurate price signals.

Q. If current evidence were to suggest that the Micron FAB’s entire load is inflexible over the span of the contract, does that suggest there is no need for price signals to align with the time-varying nature of costs?

A. As new large load customers are attracted to Idaho, a decision to allow one new large load customer to choose a rate structure that fails to align price signals with the time-varying nature of cost causation is a step down a slippery slope. Neither the Commission nor customers can predict with certainty what the cost/benefits of load shaping options will be across different customers over the coming decade.⁴ What we *can* do, to the best of our ability and with the most current outlook, is to align price signals with time-varying cost causation so that customers and

³ IPC-E-24-44, Idaho Power Testimony, Anderson Direct, p13.

⁴ Consider that ChatGPT was launched less than 3 years ago. Like AI, disruptive technologies can radically and rapidly impact the electricity industry in ways we do not anticipate.

innovators have the motive and information to pursue opportunities and make accurately informed decisions.

Q. Is the availability of solutions which could improve a customer's demand flexibility affected by pricing structures?

A. Yes. Innovators strive to pursue solutions with the potential to create value, which I believe is in the public interest. Those motives and choices are informed by the degree to which pricing structures reflect the potential to add value.

Q. Do you believe that Increased Complexity is a valid reason to exclude the Micron FAB from taking service under a time varying rate structure?

A. . The Company describes that "Increased Complexity" is a reason why TOU pricing is not appropriate for the Micron FAB.⁵ While I agree that complexity is a factor in rate design, I do not believe that "Increased Complexity" is a valid reason to exclude Micron from a price structure that reflects the time varying nature of costs. Consider, for example, the regulatory process for setting the Export Credit Rate for customers with on-site generation. Residential customers have expressed concern with the complexity of that methodology and rate structure, yet such complexity was deemed merited to ensure accurate and fair rates. The public is no less deserving of an accurate and fair rate structure for the Micron FAB, particularly given the scale of system cost impacts the Micron FAB presents.

Q: Are there potential benefits from a customer perspective to take service under time-varying rates?

A: Yes. First, I would note that different customers may see these benefits differently, and I would suggest that the benefits above to public interest are most relevant to regulatory

⁵ IPC-E-24-44, Idaho Power Testimony, Anderson Direct, p14.

decisions. E.g., the Commission approves rate increases regardless of whether customers want them. Nevertheless, I would highlight three potential benefits to a customer taking service under time-varying rates:

Greater potential to control and mitigate costs. Relative to high demand charges and flat energy rates, time varying rates allow customers more opportunities to control costs and to share in the savings associated with mitigating system costs.

GHG benefits. The hours of the day that are lowest cost to serve (around 10am to 2pm, or “Super Off Peak” hours) also correlate with hours of high solar generation and low system emissions. For customers with goals related to Greenhouse Gas (GHG) emissions, a time of use rate structure that includes a Super Off-Peak window creates an economic advantage for shifting demand for utility-supplied power into hours associated with relatively lower emissions. It also lays the groundwork for the hourly matching of energy usage and emissions should that become a GHG Protocol requirement.

Better information enables better decisions. In the absence of a Commission-approved TOU tariff, Micron is unable to accurately evaluate the financial benefits of future storage or other load shaping opportunities which have the potential to mitigate costs and/or to help Micron achieve its clean energy goals.

Q. How might Micron be harmed by a time-varying rate structure?

A. Regardless of what revenue requirements are approved in this docket, a time-varying rate structure could be designed to yield the same revenue requirements. That is, if Micron’s actual load shape were the same as the projected load shape associated with the approved revenue requirements, Micron’s total bill under the time-varying rate structure would be the same as that under the rate structure proposed in the application. While this would allow Micron

the potential to benefit if it were able to favorably modify its load shape, the potential harm to Micron would occur if the company's actual load shape were less favorable than that assumed in the determination of revenue requirements. E.g., if Micron's load were disproportionately higher than projected during On-Peak, its bill would be higher to reflect the higher causation of costs. In that scenario, I would suggest that paying for higher cost causation would be appropriate.

Q. Does the Company have other customers subject to standard time-varying rates?

A. Yes, four examples include:

- Large Power Service (a.k.a. industrial customers) take service under Schedule 19, which is a time-of-use tariff with energy charges that vary by season and time period (On-Peak, Mid-Peak, and Off-Peak). For example, in the Company's current General Rate Case (GRC), the proposed energy charges for Secondary Service include 7.3300¢/kWh On-Peak versus 5.0473¢/kWh Off-Peak in Summer.⁶
- Brisbie, LLC (a.k.a. Meta) takes service under Schedule 33, a time-of-use tariff with energy charges that vary by season and time period. For example, in the Company's current GRC, the proposed energy charges for this data center include 6.7062¢/kWh On-Peak versus 4.3865¢/kWh Off-Peak in Summer.⁷
- Schedule 20 for Speculative High-Density Load is a time-of-use tariff with energy charges that vary by season and time period.
- On-Site Generators receive an Export Credit Rate (ECR) for exports to the grid. In its IPC-E-25-15 ECR Update application, the Company proposed a credit of 14.0598¢/kWh On-Peak versus 1.7682¢/kWh Off-Peak in Summer.⁸

⁶ IPC-E-25-16, p62 of pdf, Schedule 19.

⁷ IPC-E-25-16, p79 of pdf, Schedule 33.

⁸ IPC-E-25-15, Application p10.

Q. Has the Company presented evidence that price signals should reflect the time-varying nature of capacity cost causation?

A. Yes. See the direct testimony of Jared Ellsworth in IPC-E-23-14, p17, which refers to the Export Credit Rate:

Q. Why does the Company believe it is reasonable to provide a time-variant credit for capacity?

A. The procurement of capacity resources is driven by the identified hours of highest risk - the period that capacity can be avoided. By aligning the period of capacity avoidance with that of the ECR, a price signal is created that could incentivize customers to invest in or optimize systems to maximize output during the period of capacity avoidance. Examples of a potential incentivized price signal with a time-variant credit for capacity include systems with optimized direction of panels or installation of energy storage devices.

Q. Regarding the citation above from IPC-E-23-14 in which the Company recommends time variant rate price signals to reflect the potential for capacity cost avoidance, did the Company present that an investment to time-shift some load, such as storage, is cost effective for customers?

A. The Company did not base its recommendation on whether storage would be cost-effective for customers. The issue at hand was not to evaluate the cost effectiveness of storage from the perspective of an on-site generator but to align rate structure with the time-variant nature of costs. With regard to Micron, I similarly believe that the regulatory issue at hand is not to evaluate the current and future cost/benefits of storage or other load shaping opportunities from Micron's perspective behind the meter, but to align price signals with the time-variant nature of costs.

Q. What do you see as the most significant opportunities to further improve on the Company's current approach to rate design for its cost-based TOU tariffs?

A. I believe the two most significant opportunities to improve are:

1. Include a "Super Off Peak" time window. Historically, the Company's approach to TOU has centered around high risk On Peak hours and includes long periods of Off Peak that include nighttime hours. Those time periods have reasonably aligned with cost dynamics in the past. Those dynamics, however, have changed and merit a change to the time windows for time-varying rates.

Price signals should be forward looking. Idaho Power's market price forecasts demonstrate the emergence of an exceptionally low-price window around 10am to 2pm when solar supply is high relative to demand. See Exhibit 1 for a comparison of historical EIM prices relative to Mid-C forecasts across hours of the day.

Note also in Figure 1 (p4) that during all months of the year this 10am to 2pm period shows very low Loss of Load risks, indicating that load increases during this period are unlikely to require capacity resource additions.

2. Use volumetric charges (per kWh) during higher risk time windows rather than Demand charges for the recovery of generation and transmission capacity costs.

a. Peak demand on the system no longer aligns with peak risk, which typically occurs later than peak demand when solar output declines faster than load. As the Company describes in its 2023 Integrated Resource Plan (p121), "As the wider industry, and the company, moves towards VERs whose hour-to-hour and season-to-season generation changes, it is no longer viable to only contemplate peak hour requirements."

b. Risk varies substantially across hours of the day and year, as was illustrated in Figure 1 (p4). A Non-Coincident Peak (NCP) demand charge assumes that cost causation is flat across all hours, and as such is misaligned with cost causation. A Coincident Peak demand charge does not incentivize load-shifting into hours with exceptionally low capacity causation.

c. Demand charges *disincentivize* customers from changing load shape in a manner that could mitigate costs. The use of Non-Coincident Peak demand charges provides little incentive for customers to shape their consumption into low-cost periods and help the utility avoid capacity additions. For example, a technology enabling a customer with a flat load to shift load from a high-risk hour to a low-risk / low-cost hour would yield system benefits yet would *increase* the customer's demand charge.

Q. Please suggest an alternative methodology for determining a time-varying rate structure for Micron FAB which would incorporate the improvements you have described.

A. First, I want to acknowledge that there is no singular truth defining how cost causation varies with time. One extreme is to only consider how a kWh impacts costs in that moment, while in economics the saying is “all costs are variable in the long run.” Further, rate designs include subjective decisions to balance complexity, stability, and other factors.

Below is one strawman approach described in three steps:

Step 1: To establish a baseline for comparison, apply the same methodology to the Micron FAB's energy charge that was applied to Brisbie's energy charge as proposed in IPC-E-25-16. For context, the Company's proposed Summer On Peak energy charge for Brisbie is 53% higher than the proposed Summer Off Peak energy charge, while the proposed energy charge for the Micron FAB is flat.

The intent of this Step 1 is to enable a more informative comparison of the strawman I propose via Steps 2 & 3, which reflect recommended improvements to the TOU rate structure, to a baseline TOU rate structure for Micron FAB.

Step 2: Incorporate a Super Off-Peak time window. I would suggest revising the Company’s existing six TOU time windows as follows:

Table 1: Changes to Time Windows

Current	Strawman
Summer On-Peak = 7pm-11pm, Jun - Sep Non Summer On-Peak = 6am-9am & 5-8pm Mon-Sat except holidays	No change.
Summer Off-Peak Non Summer Off-Peak	Introduce a Super Off Peak window, 10am – 2pm every day all year.
Summer Mid-Peak Non Summer Mid Peak	A Summer and Non Summer “Base Rate” would apply to all hours other than On Peak or Super Off-Peak, substituting for the current mid-peak and off-peak designations.

The Company has traditionally used a price ratio to modify prices for each time window. The use of forward-looking market price differentials could provide more meaningful price ratios than those that result from historical EIM market averages. I suggest using a multi-year average of projected market prices from the Company’s most recently filed Integrated Resource Plan in order to adjust the energy portion of per kWh rates.

Step 3: For the Demand Component, generation and transmission capacity costs should be recovered via volumetric charges per kWh associated with hours of relatively higher risk. I suggest that demand costs for generation and transmission capacity across On Peak and Base Rate loads, and a reasonable ratio be applied to spread a higher portion of costs to load occurring during On Peak versus Base Rate hours. For example, the Summer demand component could be

spread across Summer On Peak load at 3x the per kWh demand component for the Base rate. The Non-Summer On Peak demand component could be spread across Non Summer On Peak load at 2x the demand component for the Base rate. No demand component should be applied to Super Off Peak load given the Loss of Load Probability is consistently low during those hours.

In effect, the steps above would result in a time-varying rate structure which would allow Micron to evaluate technologies and operating decisions which could result in system benefits. The rate structure could be designed such that, if Micron FAB's actual load shape is the same as the projected load shape associated with the approved revenue requirements, the total bill under the time-varying rate structure would be the same as that under the rate structure proposed in the IPC-E-24-44 application.

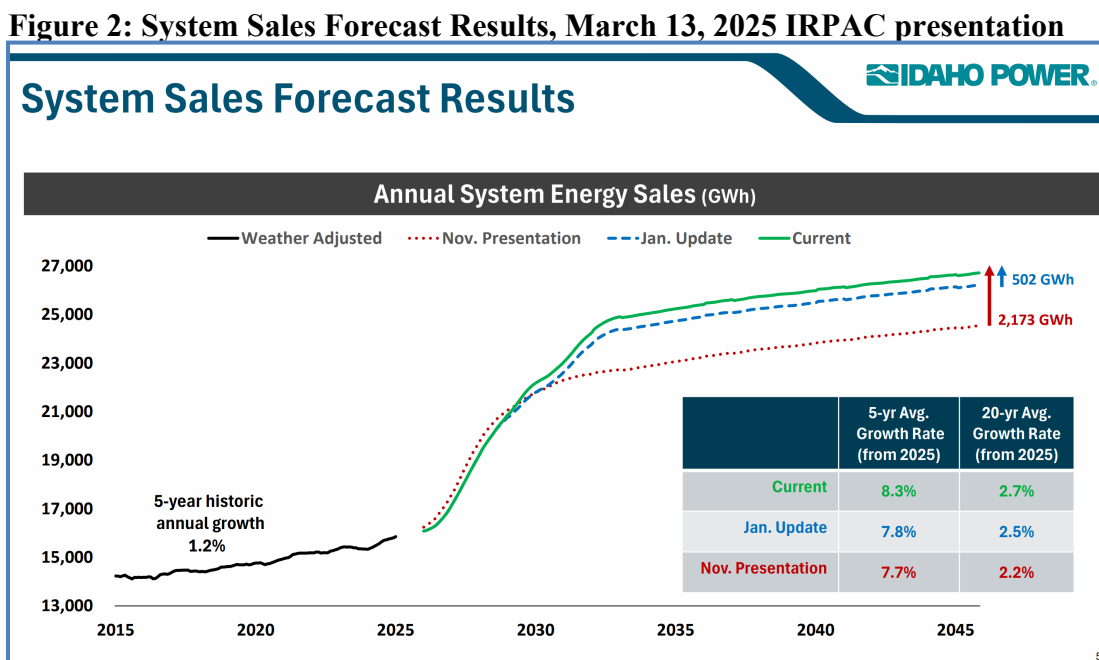
Q. Are there other alternatives to a time-varying rate structure for Micron?

A. Yes, rate design involves several variables which can be modified to achieve certain goals. For example, if there are benefits to a higher differential in prices, there is justification to narrow the On-Peak window to July and August. In that example, one could tie the July-August On-Peak rate to the avoided cost rate for Storage Qualifying Facilities (\$393.32/MWh)⁹.

Q. Looking ahead, are there other reasons for implementing a time-varying rate structure for Micron?

⁹ *Idaho Power Rates Order No. 36610 – New Contracts*, p11 - AVOIDED COST OF CAPACITY FOR ENERGY STORAGE(IPCO), column “Non-Levelized Avoided Cost of Capacity During Peak Hours”. <https://puc.idaho.gov/Fileroom/PublicFiles/electric/Idaho%20Power%20Rates%20Order%20No.%2036610%20-%20New%20Contracts.pdf>.

A. Yes. First, note that Micron’s load growth accounts for the majority of the Company’s load growth forecasted for the remainder of this decade. Figure 2 illustrates the magnitude of this growth:



To serve this growth, the Company anticipates dramatic increases in imports of variable energy, which will be further enabled by the completion of both the B2H and SWIP-North transmission links. The Company’s resource planning anticipates a substantially higher reliance on market purchases in 2031 (see Figure 3) ¹⁰, for which costs vary across hours of the day.

¹⁰ <https://docs.idahopower.com/pdfs/AboutUs/PlanningForFuture/PreliminaryPortfolioResults041725.pdf>

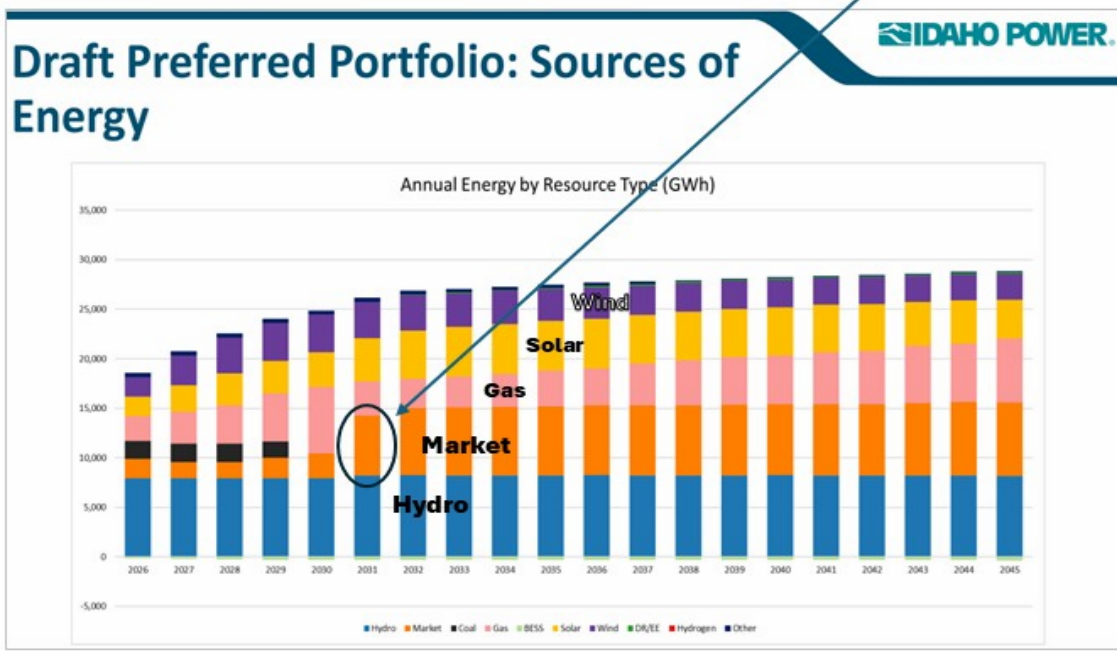
Figure 3 . Draft Preferred Portfolio: Sources Energy

Idaho Power Preliminary Portfolio Results and Reliability Analysis, Slide 8

April 17, 2025 IRPAC presentation

(labels added)

Note the increased reliance starting 2031 on market purchases



Micron's load growth will have a substantial effect on future system costs and is integral to the Company's growing reliance on time-sensitive resources such as solar and market purchases. This impacts, for example, the price differentials for industrial customers, Brisbie, and any other customer who takes service under time of use tariffs. It impacts the Export Credit Rate for on-site generators. I oppose the proposal to exclude Micron from taking service under a time-varying rate structure, and I oppose a rate structure of demand charges which encourage flat loads and disincentivize load shaping opportunities that have the potential to mitigate system costs.

Q. Could you summarize your testimony?

A. In sum, I recommend that the proposed rate structure (Attachment 2 – Proposed Tariff Schedule 28) should not be approved, and that a process should be ordered for modifying the rate structure to more accurately reflect the hourly, time-varying nature of cost causation.

- Cost dynamics have changed. Both energy & capacity cost causation varies significantly by hour, which should be reflected in any new rate schedule for a large load customer.
- The benefits of better aligning the Micron FAB rate structure with the time-varying nature of cost causation far outweigh the potential harm.
- The regulatory process is not purposed to determine which large customers over time will be able to cost effectively take advantage of current or future load shaping opportunities. The task at hand is to design a resilient rate structure. More accurate price signals provide Micron and future customers the motive and information to weigh the cost/benefits of opportunities with the potential to mitigate future costs.
- Regardless of the methodology for revising Micron’s proposed rate structure, I would emphasize that it include –
 - A Super Off-Peak time window to reflect the emergence of hours which are exceptionally low cost to serve, and
 - Generation and transmission capacity costs should be recovered via volumetric charges associated with hours of relatively higher risk. Demand charges discourage decisions and investments which could improve overall system costs.

Q: Does this conclude your testimony?

A: Yes.

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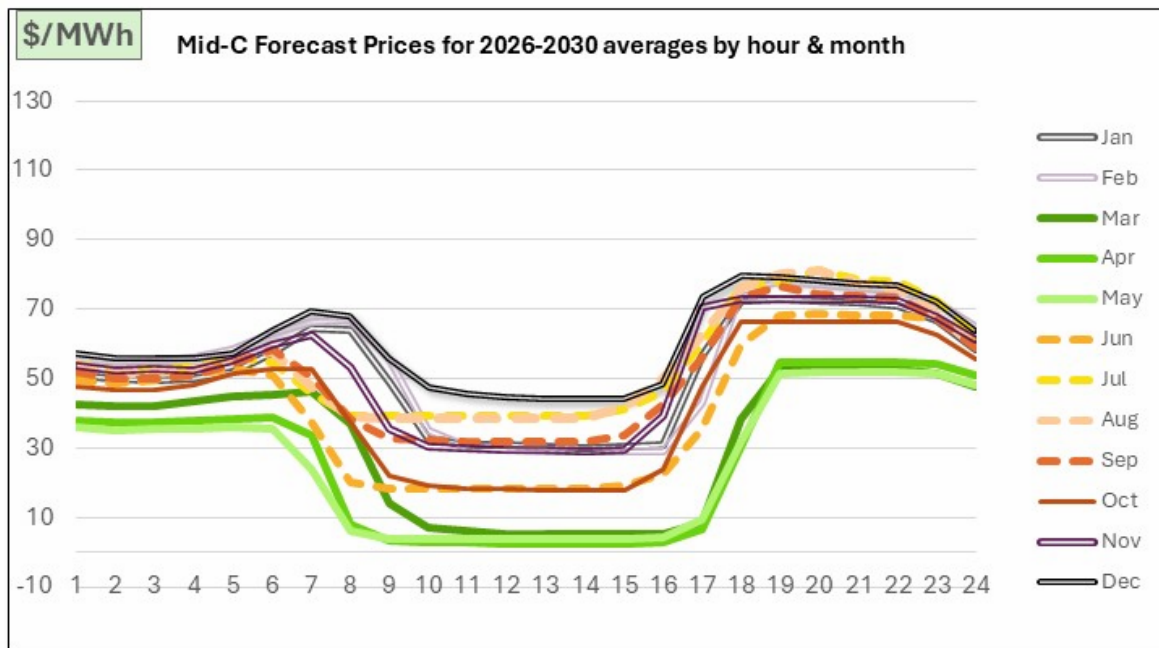
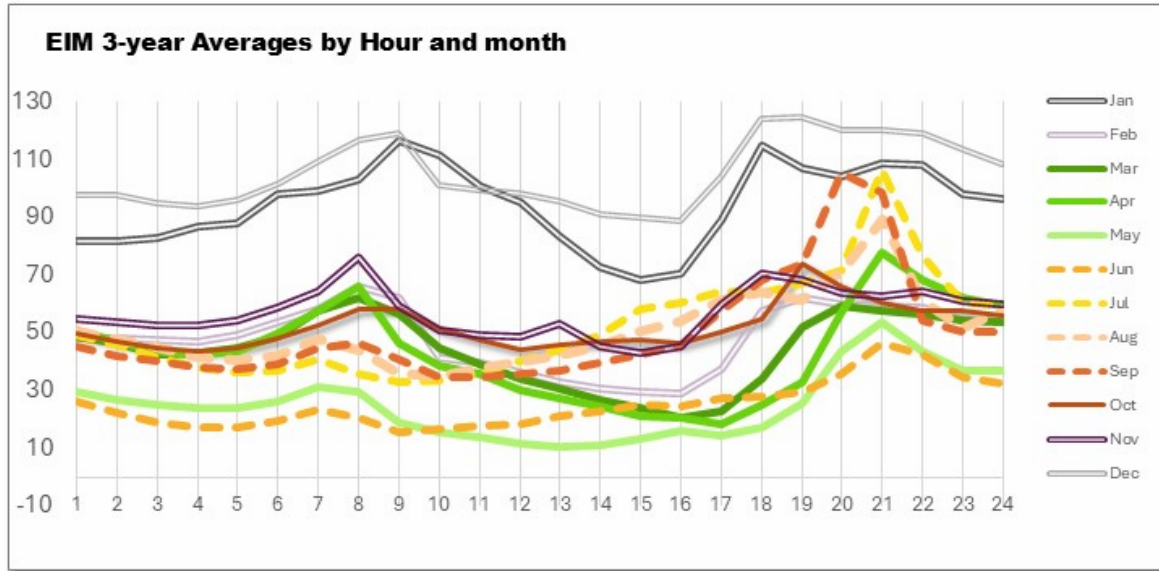
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EXHIBIT NO. 1

Exhibit 1: Market Price Averages by Month & Hour

Below are illustrations of historical EIM prices as well as forecasted Mid-C price averages across 24 hours of the day.



Sources:

2024 EIM prices sourced from 20250401Exhibit 2 – Ellsworth Direct, IP-E-25-15;

2022-2023 EIM prices sourced from Response to CEO PR 4.3, IPC-E-25-15;

CEO calculation of averages

8760 Mid-C data is from the 2023 IRP, sourced from IPC-E-24-23, CEO calc of averages.

CERTIFICATE OF SERVICE

I hereby certify that on this 30th day of June, I delivered true and correct copies of the foregoing DIRECT TESTIMONY to the following persons via the method of service noted:

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A handwritten signature in blue ink, appearing to read "Kelsey Jae".

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