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Data Centers and Affordability

Oregon Data Center Advisory Committee

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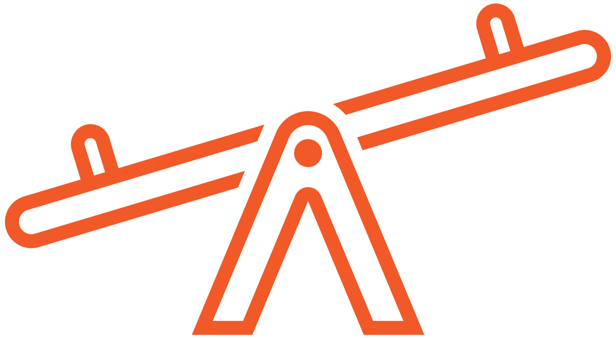
Zooming Out

- Data centers are one form of load growth, albeit one with outsized impacts and unique characteristics
- Understanding the affordability impacts of data centers requires a careful look at the incremental costs and other impacts and a comparison with revenues and other benefits
- Absent external funding sources, maintaining affordability for existing ratepayers requires both control of costs and a hard look at all revenue contributions from data centers

When is Load Growth Bad for Existing Customers?

- Existing customers pay more when marginal costs are higher than the additional revenue from the new customer/load
  - New load has high marginal costs
  - Rates for growing load are low
  - When the new load is speculative or could exit quickly
- Prior to new investments, previously unexpected load growth has a range of downsides
  - Expensive power plants generate more often
  - Higher line losses
  - Greater reliability risks



The Affordability Puzzle

Planning & Investments

Improving forecasts

- Scrutinizing data center demand decreases speculation
- Increases confidence that any new infrastructure will serve new load

Keeping costs low

- Considering low-cost and low-risk resources on equal footing
- Unlocking demand flexibility benefits

Regulatory Frameworks & Rates

Shaping the landscape

- Structural reforms make good results more likely
- Business model reform turns utility into partner

Allocating costs and risk

- Understanding the revenue life cycle
- Improving core cost allocation methods

Advanced rate design

- Balancing revenue certainty and efficient marginal cost pricing

Proactive Planning Strategies for All End Uses

1. Forecasting improvements:
   - Additional data sources and methodologies for forecasting energy demand are incorporated in determinations of grid need to account for emerging and evolving loads.
2. Changes to criteria for investments:
   - Determination on when investments in the grid are made should evolve in the face of novel sources of demand to continue to ensure lowest cost and most beneficial outcomes for energy customers.
3. Prioritization:
   - Managing the risk and uncertainty in forecasting demand requires a balanced approach to ensure adequate capacity to serve demand reliably is preserved while costs are contained.

Scrutinizing Data Center Demand

- Utilize data center contingencies, scenarios, and sensitivities
  - "All models are wrong, but some are useful." – George E.P. Box
  - Exclude data centers from base case
  - Consider project likelihood via milestones

- Account for data center load flexibility in modeling
  - Big potential benefits from small amounts of flexibility – which is possible!
  - Must be accounted for in planning to capture system benefits (ESIG report)

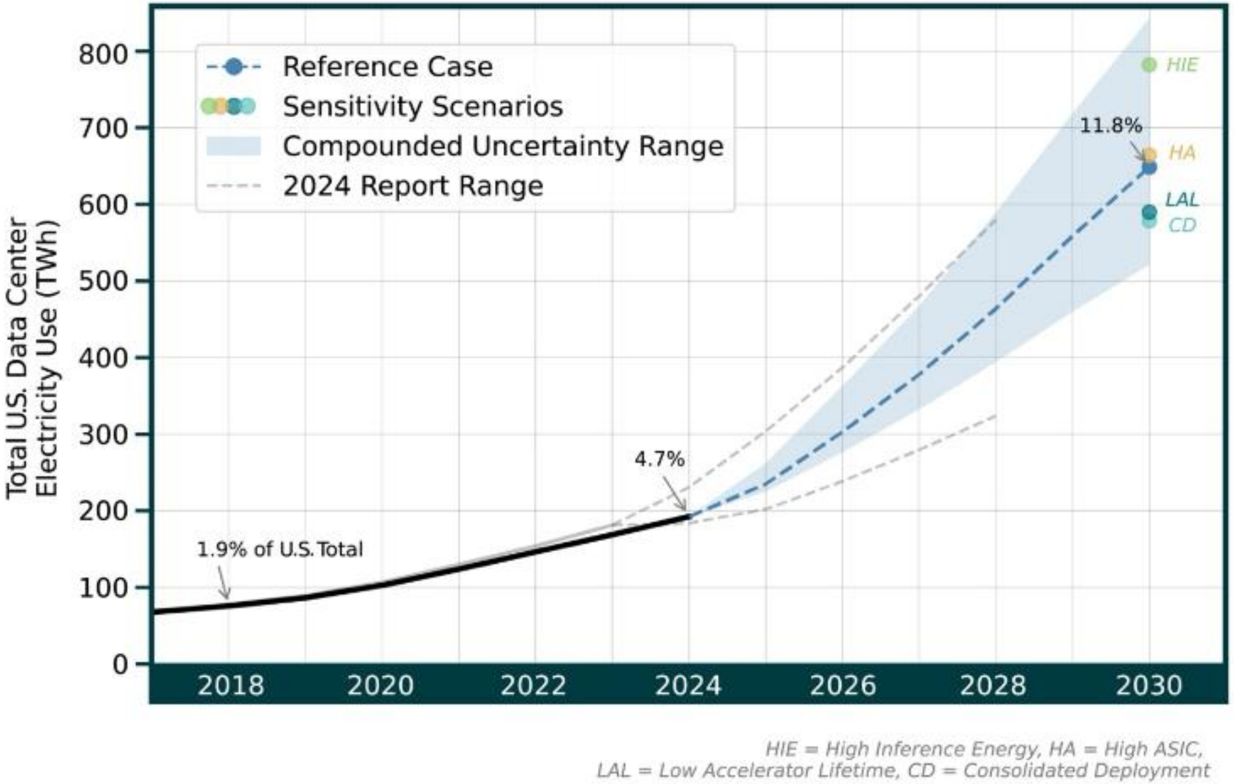


Figure 1. Total U.S. data center electricity use from 2017 through 2030

Source: Smith, S., et al. (2026, June 18). United States Data Center Energy Usage Report: 2025 Update, LBNL. Retrieved from https://escholarship.org/uc/item/33m6w3x0

Keeping Costs Low

Transmission innovations

Includes:
- Grid enhancing technologies (“GETs”)
- Advanced transmission technologies (“ATTs”)
- Surplus interconnection

System-wide flexibility & efficiency

Includes:
- Energy efficiency or demand response programs
- Distributed energy resources
- Virtual power plants

Cheap & clean utility scale resources

Includes:
- Solar, wind
- Battery storage

Unlocking Demand Flexibility Benefits

Tools and strategies:

- Evaluate or expand existing programs
- Ensure transparent, integrated planning across distribution and transmission
- Require pilots or options for DER aggregation; successful pilots move into programs
- Push for statewide and regional consistency
- Ensure customers have access to energy usage data

Examples:

- Google & Xcel MN Pine Island project pays for distributed batteries and other clean energy through a Clean Energy Accelerator Charge
- Renew Home, Sunrun, Tesla national VPP
- Google-Voltus deal for 100 MW VPP in PJM
- Evergy KS & Ameren MO tariffs allow customers to opt in to preferred resources, including DER and EE programs
- VA, IL have new VPP mandates
- MN HF16 requires large customers to pay an annual fee for low-income weatherization

Regulatory Structures and Revenue Frameworks to Encourage Cost Control

- Build commission staff capacity and incorporate AI in filing review
- Advance understanding of prudence review concepts and implementation
- Streamline permitting and interconnection processes
- Reform the utility business model to encourage utility to manage costs and protect customers from fuel price risks
- Improve regional coordination and market integration

The Revenue Life Cycle

Interconnection

- Fees, deposits, collateral requirements, proof of credit
- Contribution in aid of construction

Monthly bills

- Rates

Disconnection

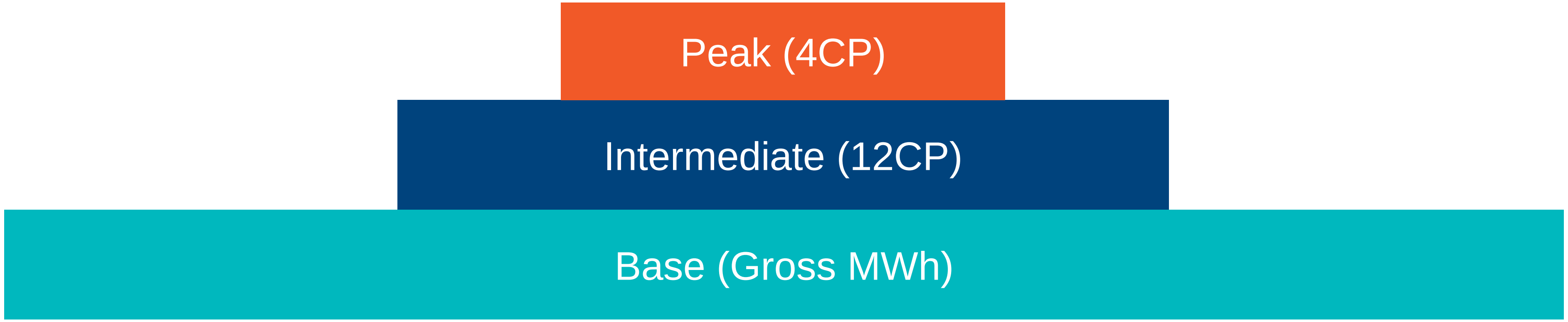
- Commitment terms and exit fees
- Reassignment options

Potential Underlying Problems with Rates

- Existing contribution in aid of construction policies may be outdated
- Existing rates may have a poor marginal cost basis
- Existing cost studies and prevalent analytical methods do a poor job estimating marginal costs in many jurisdictions
- There are major analytical disputes about how to estimate marginal costs
- Even if you do a great job estimating marginal costs, it is a major challenge to design rates that both (1) follow marginal costs and (2) collect the right amount of revenue

Cost Allocation for Bulk Transmission

- Current wholesale transmission cost allocation and pricing methods
  - CAISO: Gross MWh
  - ISO-NE: 12CP
  - ERCOT: 4CP (June to September)
- Each suboptimal individually, but better together
  - Base-intermediate-peak method!



Key Criteria for Advanced Rate Design

Criteria	Key Questions to Ask
Efficient customer price signals	Will customer behavior help lower future system costs?
Customer understanding	Can customers manage their bill? Can they understand why they are paying a different amount than their neighbor?
Fair cost allocation	Do customers contribute to system and program costs that they use and benefit them? In a reasonable proportion?
Administrative costs and feasibility	What are the incremental costs for new analysis, new proceedings, billing system changes and new education efforts?
Effective revenue requirement recovery	Do rate design changes pose new risks to revenue recovery? Can that be counterbalanced with other changes?

SMUD C&I Subtransmission Rates (1 MW)

Rate Element	Price	
Customer Charge ($/month)	$1,420	
Site Infrastructure ($/NCP kW)	$3.935	
	Summer (June to Sept.)	Non-Summer
Peak ($/kWh)	$0.203	$0.144
Off-Peak ($/kWh)	$0.113	$0.118
Off-Peak Saver ($/kWh)	N/A	$0.076
Peak Demand Charge ($/NCP kW)	$11.435	N/A

https://www.smud.org/-/media/Documents/Rate-Information/Rates/CI-TOD4.ashx

Questions?

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About RAP

Regulatory Assistance Project (RAP)® is an independent, global NGO advancing policy innovation and thought leadership within the energy community.

Learn more about our work at raponline.org

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Simplified rate-making process