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Sustainable Electric Energy Rates

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Presentation Outline

Discuss

- Sustainable Rate Structure
- Today's Rate Structure
- Basis for Today's Rates
- Review PGE SEC Form10-K Data
- Discuss NYISO January 2025 Costs
- Sustainable Electric Rates
- Recommendations

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MRP and PBR

- **Multi-Year Rate Plans**

  Offer utilities predictable revenue and customers stable bills.

- **Performance Based Rates**

  Tie revenue and profits to specific performance goals.

- **Sustainable Rates**

  Focus on ROI considering Infrastructure and Energy Production.

  Assure affordable, high-value service; clean energy development; and community benefits.

Oregon PUC Adaptability Statement: We develop expertise and adapt our skills, our organization, and our regulatory processes and tools in order to meet rapid change in our regulated industries.

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Sustainable Rates: Benefits

- **Infrastructure - $ per KW (monthly)**
  Customers know their infrastructure charge for the year.
- **Energy – ¢ per KWH (hourly)**
  All customers pay the same rate for energy – 24 / 7/ 365
- **Electric Utilities**
  Minimize overbuilding.
- **Energy Production Facilities**
  Understand how to meet ROI expectations.
- **Oregon PUC**
- Have metrics that justify electric rates

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Sustainable Rates: Residential Customers

- **Infrastructure - $14 per KW (monthly)**

  Wires to consumers

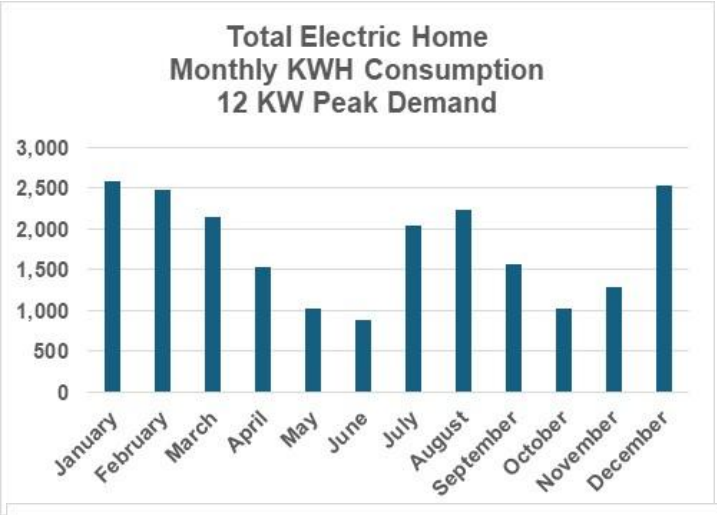
  Based on maximum demand during previous year

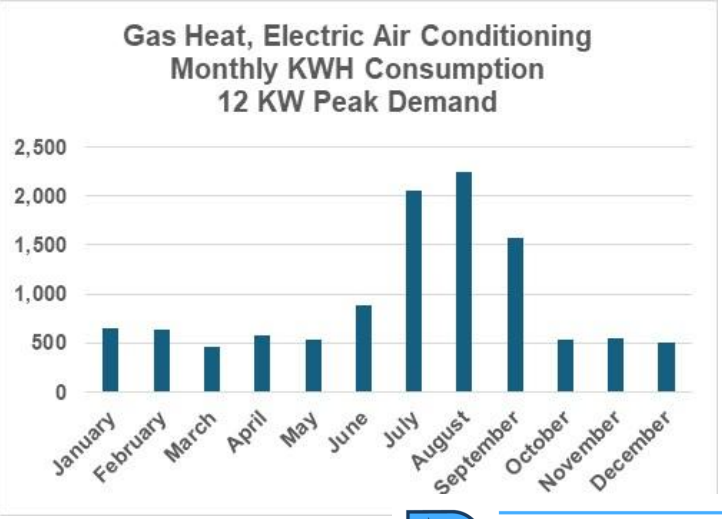
- **Energy – 8¢ per KWH (hourly)**

  Hourly consumption

Comparison: KW is motor horsepower.
KWH is energy consumption.

Electric utilities receive a better return on their investment to supply total electric houses than on their investment to supply gas heated houses.





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Sustainable Rates: Commercial Customers

- **Infrastructure - $11 per KW, Utility Owned Transformers**

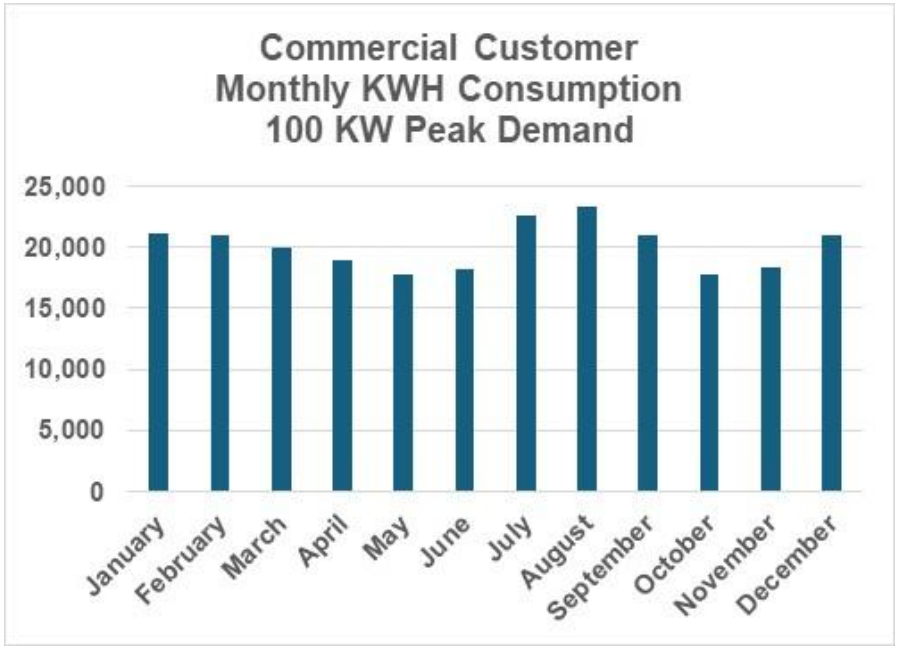
  Rates based on maximum demand (KW) during previous year.

- **Infrastructure - $8 per KW, Customer Owned Transformers**

  Rates based on maximum demand (KW) during previous year.

- **Energy – 8¢ per KWH**

  Same rate as residential



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Sustainable Rates: Industrial Customers

- **Infrastructure - $7 per KW, Utility Owned Transformers**

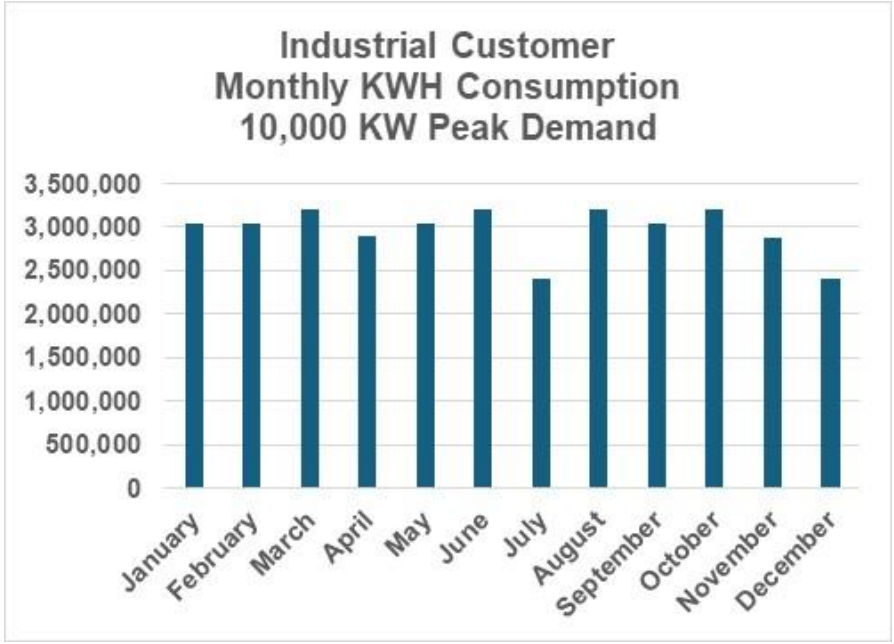
  Rates based on maximum demand during previous year

- **Infrastructure - $3 per KW, Customer Owned Transformers**

  Rates based on maximum demand during previous year.

- **Energy – 8¢ per KWH**

  Same rate as residential



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Sustainable Rates: Data Centers

- **Infrastructure - $7 per KW, Utility Owned Transformers**

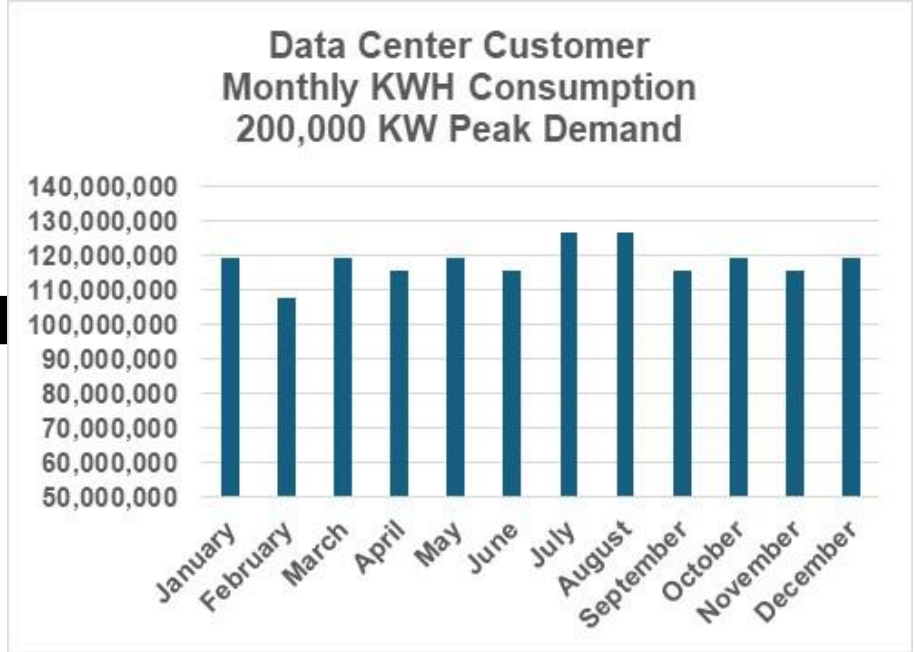
  Rates based on maximum contract demand.

- **Infrastructure - $4 per KW, Customer Owned Transformers**

  Rates based on maximum contract demand.

- **Energy – 8¢ per KWH**

  Same rate as residential



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Sustainable Rates: New Large Customers

Payments begin as soon as contracts are signed.

- **Infrastructure - $7 per KW, Utility Owned Transformers**

  Rates based on maximum contract demand.

- **Infrastructure - $4 per KW, Customer Owned Transformers**

  Rates based on maximum contract demand

- **Energy – 8¢ per KWH**

  Same rate as residential

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Prescient's Vision

Electric utilities, government agencies, energy production facilities, regulators, and consumers should share the mission, namely:

Our mission is to ensure Oregonians have access to safe, reliable and fairly priced utility services that advance state policy and promote the public interest.

Safe: No undetected wildfire ignitions

Reliable: Less than 1 interruption per year, Less than 1 hour per Interruption

Fairly Priced: Less than $1600 per year for a family of three

Greenhouse gas emissions: Less than 0.1 lbs of CO_2 per KWH (yearly interpretation).

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Today's Electric Rate Structure is Unfair!

- Residential & Commercial Customers

are subsidizing

- Customers with Solar Panels
  - Customers with Electric Vehicles
    - Industrial Customers
      - Data Centers

Will consumers pay for Oregon's climate ambitions, data center boom?

Electricity bills have soared in Oregon in the past six years, with nearly 58,000 residents disconnected last year. Experts say bills could climb ...

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Today's Electric Rate Structure is Complex

Pricing Plans include:

- Time-of-Use
- Tiered electric
- Solar
- Electric vehicle
- Electric home
- SmartRate™ program
- Community renewable programs
- Market based

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Basis for Today's Electric Rates: Infrastructure Costs

Fixed Costs

- Transmission Lines
- Distribution Lines
- Substations
- Service Transformers
- Operations and Maintenance

Built for Peak Load Conditions

- Light Load: < 30% Usage
- Peak Load: < 60% Usage

B2H power line costs hover near $100 million

Published 7:00 am Saturday, August 24, 2019

By Phil Wright
East Oregonian

PENDLETON — The massive Boardman to Hemingway Transmission Line has cost around $100 million without the installation of a single utility pole.

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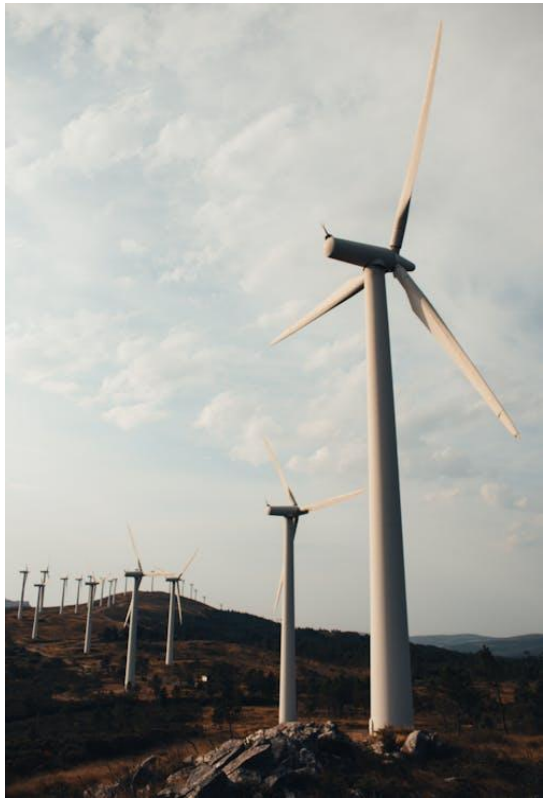
Basis for Today's Electric Rates: Energy Costs

Includes cost of equipment

- Natural Gas — Varies with cost of gas
- Hydroelectric — Fixed cost
- Coal — Varies with cost of oil
- Solar — Fixed cost
- Wind Production — Fixed cost
- Energy Storage — Varies with cost of energy



Built Considering ROI (Return on Investment)

- Low Cost: > 75% Capacity Factor
- High Cost: < 50% Capacity Factor
- Very High Cost: < 5% Capacity Factor (< 15 days per year)

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PGE SEC Form10-K 2025 Data

SEC Form 10-K provides data that investors use to decide where to invest. Form 10-K data includes:

Rate Class	Number of retail customers:	Retail energy delivery (MWh)	Retail revenue	Revenue per kilowatt hour
Residential	829,721	7,732,000	$1,457,000,000	18.19 ¢
Commercial	113,942	7,024,000	$ 924,000,000	13.09 ¢
Industrial	281	6,941,000	$ 458,000,000	6.59 ¢

SEC Form 10-K is submitted by all investor-owned electric utilities.
PGE data is displayed because PGE is an Oregon electric utility.

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NYISO January 2025 Energy Costs

Typical Cost Area Data (A-West, 744 hours, January 2025)		
Highest Cost:	$946.46 per MWh	1/6/2025 17:00
Lowest Cost:	$2.29 per MWh	1/27/2025 5:00
Median Cost:	$71.53 per MWh	

NYISO energy cost data is displayed because Oregon data is not available to the general public.

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NYISO January 2025 Energy Costs

Typical Cost Area Data (A-West, 744 hours)		
Greater than $250 per MWh	10 hours	1.3% of Hours
Between $100 and $250 per MWh	196 hours	26% of Hours
Between $80 and $100 per MWh	114 hours	15% of Hours
Less than $80 per MWh	424 hours	57% of Hours

A-West is one of eleven NYISO cost areas.
A-West energy costs exceeded $100 per MWH for
2 hours in April and 8 hours in August 2025.

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Ensuring Fair Residential Electric Rates

- Existing rates **PENALIZE** residential customers who do not install solar, purchase electric vehicles, or sign up for tiered rates.

  As more residential customers install solar, penalties increase.

  As more EVs are purchased, penalties increase.

  Tipping point is 30% as KWH Revenue will be less than allowed ROI.

- To be **FAIR**, rates must be based on **Infrastructure Costs** and **Energy Costs**.
- **Sustainable Electric Rates** should be **Revenue Neutral**

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Sustainable Electric Rates

What are typical sustainable electric rates in Oregon in 2026?

	KW (Peak Demand)	KWh (Consumption)
Residential	$14 per KW	8¢ per KWh
Commercial	$11 per KW	8¢ per KWh
Industrial	$3 per KW	8¢ per KWh
Data Center	$4 per KW	8¢ per KWh

KW: How much energy a customer may want at any time.
KWH: How much energy a customer buys each month.

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Sustainable Rates, Estimated Yearly Costs

Residential Property Owner Choices	Demand	Usage	Yearly Cost of Electricity
Wood Heat, Window Fans	1.50 KW	2,880 KWH	$482
Gas Heat, Window Air Conditioner	2.50 KW	4,116 KWH	$749
Gas Heat, Central Air	7.50 KW	7,140 KWH	$1,831
Electric Heat, Central Air	12.00 KW	17,980 KWH	$3,454
Wood Heat, Window Fans, Rooftop Solar	1.50 KW	-10,040 KWH	-$1,469
Gas Heat, Window Air Conditioner, Rooftop Solar	2.50 KW	-8,804 KWH	-$1,247
Gas Heat, Central Air, Rooftop Solar	7.50 KW	-5,780 KWH	-$166
Electric Heat, Central Air, Rooftop Solar	12.00 KW	5,060 KWH	$1,170

This table illustrates what a variety of residential customers would pay after a sustainable rate structure is implemented.

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Ensuring Fair Commercial and Industrial Electric Rates

- Sustainable Electric Rates **must reflect actual costs** for infrastructure and energy.
- Customers with two-line supply must pay KW charge for each line.
- Commercial and Industrial customers must commit to three years of electric service.

Infrastructure

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Ensuring Fair Data Center Electric Rates

- Sustainable Electric Rates for Data Centers must reflect actual costs for infrastructure and energy.
- Data Center customers with two-line supply must pay KW charge for each line.
- Data Center customers must commit to anticipated KW demand after five years of electric service.

MCD 7 LLC data center campus on 192 acres in Limerick Township, Pennsylvania.

The project would consist of five buildings and three facilities and require 750MW of capacity from local utility. Full build-out could take up to five years.

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Electric Utility Goals should include:

- **Only four rate classes:**
  Residential, Commercial, Industrial, Data Center
- **Reduce** future rate increases by 50%
- **Optimize** utilization of existing facilities
- **SAIDI**: Less than 15 minutes per year
- **SAIFI**: Less than 0.01% per year
- **Wildfire Ignitions**: Detect before wildfires exceed 5 acres
- **CO_2 emissions**: Zero during daylight hours
  Less than 0.3 lbs per KWH, other hours

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Think like Samuel Insull (The Architect of Modern Electricity Pricing):

Goals can be met by

1. Changing operating strategies
2. Establishing “Shutters” that halt energy purchases
3. Reducing investment in “Contingency” facilities
4. Automating distribution systems
5. Establishing flow control in transmission systems
6. Changing rate structures

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Questions?

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For a Deeper Understanding:

The remainder of this document presents recommendations that can be implemented to reduce future rate increases while assuring affordable, high-value service; clean energy development; and community benefits.

Prescient recognizes that these recommendations require a high level of technical awareness. As Subject Matter Experts, we are willing to meet with stakeholders one-on-one to provide in-depth explanations of each recommendation.

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Recommendations: Distribution System

Place automatic distribution line sectionalizing switches at numerous locations along each distribution line.

Automate distribution systems to facilitate load transfers between substations.

Basis for Recommendation

1. Reduce number of expensive transformers (> $1,000.000) in substations.
2. Improve SAIDI

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Recommendations: Distribution System

Petition NERC to allow “Shutters” and underfrequency load shedding when cost of energy exceeds $250 per MWH.

- Cost based underfrequency load shedding should begin when frequency decays to less than 59 Hertz.

Basis for Recommendation

- Shutters: Stop additional MWH purchases. Shutters would be implemented for 1 to 2 hours once or twice a month.
- Forced shutdown of a 1,000 MW energy production facility will cause frequency to dip less than 0.1 hertz.
- When frequency decays, motors draw less energy. This reduces the shortfall between production and consumption.

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Recommendations: Transmission System

Install inductors and capacitors in transmission lines to enhance flow control.

Basis for Recommendation:

In areas with multiple, parallel transmission lines, transmission line utilization can be increased 25% to 35% by establishing flow control.

Encourage construction of renewable energy resources at locations with unused transmission line capacity.

Basis for Recommendation

Transmission lines serving coastal areas can carry hundreds of MWH's from Tillamook to Portland with no additional investment in infrastructure.

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Recommendations: Transmission System

Require that electric utilities include accurate load representations in load flow models.

Basis for Recommendation:

Existing load flow models were developed using 1960's technology that does not utilize modern computing capabilities.

Require that electric utilities develop "fracture" models.

Basis for Recommendation

Fracture models identify unlikely conditions that result in simultaneous loss of multiple facilities with ensuing grid collapse.

Load flow models are developed assuming that corrective actions are implemented each time a facility is taken out of service.

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Recommendations: Energy Production

- Sustainable Energy Production Rates must incorporate **Baselines, Incentives, Rewards,** and **Penalties.**
- Energy Purchases must be capped at $250 per MWH.
- Frequency should be allowed to drop to 59 Hertz when the cost of energy is greater than $250 per MWH.
- Frequency should be allowed to rise to 61 Hertz when the cost of energy is less than $20 per MWH.

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Recommendations: Energy Production

Baseline

- Production Facilities (>10 MW) must forecast
    1. Hourly MWH production on a yearly basis
    2. MWH price for each hour
    3. CO_2 emissions for each hour
    4. Startup time
- Preferred production facilities will be notified that their proposal has been accepted for either
    1. Baseload Energy Production, or
    2. Standby Energy Production

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Recommendations: Energy Production

Incentives

- Baseload production facilities will receive a 10% premium for every MWH above forecast when cost of energy exceeds $250.
- Standby production facilities will receive 25% of their MWH price when in “hot” standby mode.
- Standby production facilities will receive110% of their MWH price when in production or startup mode.

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Recommendations: Energy Production

Rewards

- Baseload production facilities will receive a 5% bonus when their yearly capacity factor exceeds forecast.
- Standby production facilities will receive a 10% bonus when their yearly production exceeds forecast.
- Intermittent, renewable energy production facilities with energy storage capability will receive a 10% bonus for all renewable energy delivered.

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Recommendations: Energy Production

Penalties

- Baseload production facilities will experience a 5% holdback when their monthly capacity factor fails to meet forecast or CO_2 emissions are excessive.

  Holdbacks will be paid if yearly capacity factor meets or exceeds yearly forecast.

- Standby production facilities will experience a 10% holdback when their monthly production falls below their commitment or CO_2 emissions are excessive.

  Holdbacks will be paid if yearly production meets or exceeds yearly commitment.

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Recommendations: Oregon PUC

Develop Technical Awareness

- Encourage innovation
- Differentiate “Hype” from “Reality”
- Research industry best practices.
- Research best practices in other industries.
- Understand energy pricing ($/KWH) in New York and California.
- Appreciate the strain renewable energy production places on the electric energy grid.
- Encourage electric utilities to create opportunities for the next Nikola Tesla, the next Gordon Moore, and the next Samuel Insull.

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