# High Density Load Rate
## Public Rate Hearing Continued

February 16, 2016

CHELAN COUNTY
POWER
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# Hearing Overview to Date

- Feb. 1, 2016 – Hearing opened, staff introduced additional rate and implementation options, heard public opinion for and against the initial rate proposal
- Feb. 3, 2016 – Hearing continued, Emerging Technology Community Forum, heard public opinion for and against proposed rate action
- Feb. 16, 2016 – Hearing continued, staff to present impact of a hypothetical 100 aMW HDL load growth

# Agenda

- Review rate options presented Feb. 1
- Compare rate options – no action required
- Public Comment
- Moratorium discussion and action

# Rate Options Meeting Board Guidance of Achieving Economic/Rate Neutrality for Existing Customers

1. *Full Value Recovery for District - Initial staff proposal: (Mitigate risk of revenue loss to District)*
   - Market cost for Energy (with a floor at production cost) + full recovery for customer & delivery costs
   - ~5.036 cents/KWh [1] [2]

2. *Cost Recovery Over Time: (Mitigate risk of increased rate pressure for existing customer classes)*

   a) No sharing of market benefit/risk - District holds market risk: Production cost for Energy + full recovery for customer & delivery costs
   - ~4.57 cents/KWh [2] + upfront cost

   b) Sharing of market benefit/risk - Customer holds market risk: Higher of production cost or market cost for Energy + current customer & delivery blended rate
   - ~3.99 cents/KWh [1] [2] + upfront cost
   - Supply component to be adjusted periodically (not more frequently than annual)
   - To be paired with Contract



[1] Rate will be variable based on market – currently based on an Energy charge of 3.21 cents/KWh
[2] Following rate design, average per KWh figures presented may vary by customer depending on individual usage and load profile

# How do we compare rate options?

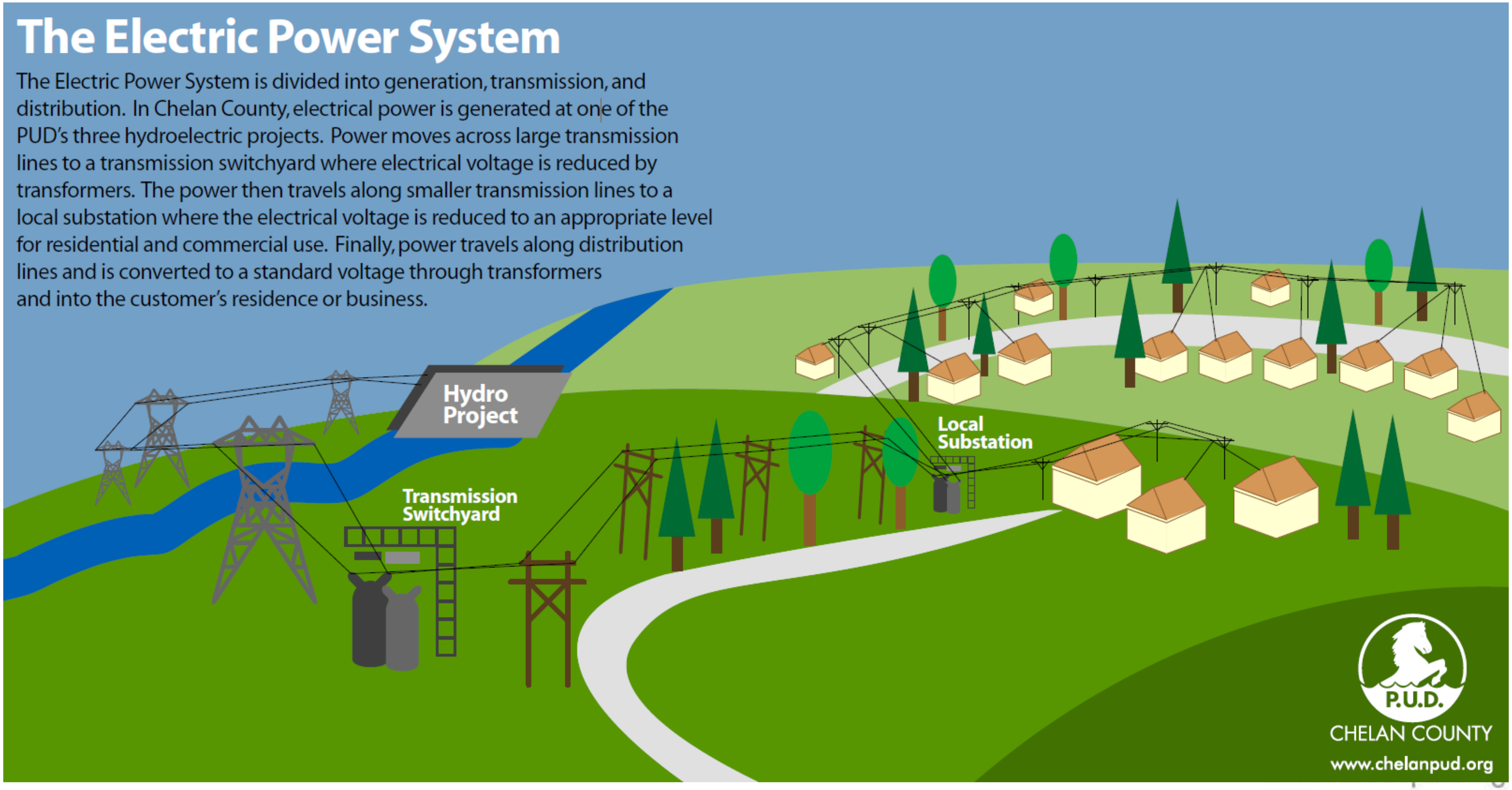
- An illustrative example: 100 aMW load growth
  - General operational impacts
  - System specific impacts
    - Transmission, Substation, Distribution
  - Financial impacts
  - Resulting risks and variability of rate options

# Assumptions for 100 aMW Analysis

- Assumes growth of HDL load after lifting of moratorium
- Assumes build-out of system over a 5-year-period to accommodate additional load
- Assumes costs are consistent with historic operations and maintenance expenses and actual or planned capital construction for similar capital assets
- Assumes the new HDL loads vary in size and location throughout the service area. A centralized approach could reduce cost however customer location choice would be limited and would not apply to existing services
- Assumes HDL loads have high load factor
- Values presented provide a rough estimate for purpose of comparison

# General Operational Impacts

- Increased demand at one level of the system requires increased capacity at all levels of the upstream system



# General Operational Impacts (cont)

- Increasing capacity and line miles requires both capital investment and ongoing operation and maintenance expenses, such as outage restoration, asset replacements, vegetation management, locating, tools and equipment, regulatory compliance, etc.

- For the purpose of this exercise, our current loading is 185 aMW, increasing this by 100 aMW is a 54% increase. It is assumed all customer and capacity expenses will increase linearly at 54% as well.  This includes direct costs only, additional costs for management, administration, etc. are not included.

# General Operational Impacts (cont)

- Increasing customer base requires additional customer service time, including payment processing, customer inquiry, changes in services, metering, etc.
- Infrastructure siting of transmission lines, substations, and other equipment is a substantial community effort
- Permitting, procurement and construction may not be feasible in a 5-year timeframe (lead time on a transformer alone is 18 months)

# Transmission Impacts

- 5-year Capital Requirement
  - ~$6M for switchyard addition
  - ~$10M for increased transmission line capacity
- Operations and Maintenance
  - ~$4.5M of additional direct expenses annually
- Staffing Increases
  - ~8 full-time positions: two engineering and associated support staff, one 4-person line crew and two wiremen
  - Temporary construction positions



**Note: Values presented provide a rough estimate. Actual costs would vary. Cost of capital not expressly addressed in these values.**

# Substation Impacts

- 5-year Capital Requirement
  - ~$19M for new substations based on location of load
- Operations and Maintenance
  - ~$1M of additional direct expenses annually
- Staffing Increases
  - ~5 full-time positions: one 3-person substation wiremen crew, two engineering and associated support staff
  - Potential temporary construction positions



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# Distribution Impacts

- 5-year Capital Requirement:
  - ~$20M for reconductoring and addition to distribution lines
  - Customer funded line extensions, meter and transformer installation, direct improvements of existing facilities to meet individual loads
- Operations and Maintenance:
  - ~$9M of additional direct expenses annually
- Staffing Increases
  - ~32 full-time and temporary crew positions: eight 4-person crews, initially focused on build-out, four crews retained for maintenance
  - ~10 full-time engineering, project management and associated support staff and servicemen



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# System Impacts Summary

| FTE= Full-time equivalent employee<br>O&M = Operations and Maintenance | **Impacts** |
|---|---|
| Transmission | -Capital: ~$16M<br>-O&M: ~$4.5M per year<br>-Staffing: ~8 FTE plus temporary construction positions |
| Substations | -Capital: ~$19M<br>-O&M: ~$1M per year<br>-Staffing: ~5 FTE plus temporary construction positions |
| Distribution | -Capital: ~$20M<br>-O&M: ~$9M per year<br>-Staffing: ~26 FTE plus 16 temporary construction positions |
| **Total direct impact (indirect impacts not included)** | **-Capital: ~$55M**<br>**-O&M: ~$14.5M per year**<br>**-Staffing: ~39 FTE plus 16 or more temporary construction positions** |



**Note: Values presented provide a rough estimate. Actual costs would vary. Cost of capital not expressly addressed in these values.**

# District Impact of 100 aMW Load Increase - Details

***An illustrative example for purpose of rate comparisons***

| | 2017 | 2018 | 2019 | 2020 | 2021 | 2022 and beyond |
|---|---|---|---|---|---|---|
| Assumed cumulative new load | 20 aMW | 40 aMW | 60 aMW | 80 aMW | 100 aMW | 100 aMW |
| **Customer and Delivery Net Impact (rate revenue less annual cost)** | | | | | | |
| At current blended rate (0.78 cents/KWh) | $ (12.5M) | $ (14.0M) | $ (15.6M) | $ (17.1M) | $(18.7M) | $ (7.7M) |
| At full cost recovery rate (1.83 cents/KWh) | $ (10.7M) | $ (10.4M) | $(10.1M) | $ (9.8M) | $ (9.5M) | $ 1.5M |
| | | | | | | |
| **Energy Net Impact (Wholesale vs. Retail)** | | | | | | |
| At current blended rate (2.06 cents/KWh) | $ (2.0M) | $ (4.0M) | $ (6.0M) | $ (8.0M) | $(10.0M) | Market Dependent |
| At market energy rate (3.21 cents/KWh) | $ 0 | $ 0 | $ 0 | $ 0 | $ 0 | Market Dependent |
| At production cost rate (2.74 cents/KWh) | $ (0.8M) | $ (1.6M) | $ (2.5M) | $ (3.3M) | $ (4.1M) | Market Dependent |



Note: Values presented provide a rough estimate. Actual costs would vary. Cost of capital not expressly addressed in these values.

# District Impact of 100 aMW Load Increase - Summary

| *An illustrative example for purpose of rate comparisons* | **Capital Investment Risk** | **Total Annual Revenue Impact after Build-out**** | | |
|---|---|---|---|---|
| | | **Expected** | **Ranges under Market Variations***** | |
| | | | Low Market | High Market |
| Current Rates | $55M risk | | | |
| Rate option #1 (Market cost energy with production cost floor + full recovery for customer and delivery cost) | $55M risk or $0 with full upfront cost recovery* | | | |
| Rate option #2a (Production cost energy + full recovery for customer and delivery cost) | $0 with full upfront cost recovery* | | | |
| Rate option #2b (Higher of market cost or production cost energy + current customer and delivery blended rate) | $0 with full upfront cost recovery* | | | |

**Note: Values presented provide a rough estimate. Actual costs would vary. Cost of capital not expressly addressed in these values.**

* $55M capital investment still required, but capital impact to District is mitigated by full upfront cost recovery from new applicants.

** Revenue impact does not include recovery of cost of capital incurred by District.

*** Market variations assume 5-year forward market rate as low-side and highest existing District slice as high-side.

# District Impact of 100 aMW Load Increase - Summary

| *An illustrative example for purpose of rate comparisons* | **Capital Investment Risk** | **Total Annual Revenue Impact after Build-out**** | | |
|---|---|---|---|---|
| | | **Expected** | **Ranges under Market Variations***** | |
| | | | Low Market | High Market |
| Current Rates | $55M risk | $ (18M) | | |
| Rate option #1 (Market cost energy with production cost floor + full recovery for customer and delivery cost) | $55M risk or $0 with full upfront cost recovery* | $ 1.5M | | |
| Rate option #2a (Production cost energy + full recovery for customer and delivery cost) | $0 with full upfront cost recovery* | $ (2.5M) | | |
| Rate option #2b (Higher of market cost or production cost energy + current customer and delivery blended rate) | $0 with full upfront cost recovery* | $ (8M) | | |

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| *An illustrative example for purpose of rate comparisons* | **Capital Investment Risk** | **Total Annual Revenue Impact after Build-out**** | | |
|---|---|---|---|---|
| | | **Expected** | **Ranges under Market Variations***** | |
| | | | Low Market | High Market |
| Current Rates | $55M risk | $ (18M) | $(11M) | |
| Rate option #1 (Market cost energy with production cost floor + full recovery for customer and delivery cost) | $55M risk or $0 with full upfront cost recovery* | $ 1.5M | $4M (production rate) | |
| Rate option #2a (Production cost energy + full recovery for customer and delivery cost) | $0 with full upfront cost recovery* | $ (2.5M) | $4M | |
| Rate option #2b (Higher of market cost or production cost energy + current customer and delivery blended rate) | $0 with full upfront cost recovery* | $ (8M) | $ (5M) (production rate) | |

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# District Impact of 100 aMW Load Increase - Summary

| *An illustrative example for purpose of rate comparisons* | Capital Investment Risk | Total Annual Revenue Impact after Build-out** | | |
|---|---|---|---|---|
| | | Expected | Ranges under Market Variations*** | |
| | | | Low Market | High Market |
| Current Rates | $55M risk | $ (18M) | $(11M) | $(27M) |
| Rate option #1 (Market cost energy with production cost floor + full recovery for customer and delivery cost) | $55M risk or $0 with full upfront cost recovery* | $ 1.5M | $4M (production rate) | $ 1.5M |
| Rate option #2a (Production cost energy + full recovery for customer and delivery cost) | $0 with full upfront cost recovery* | $ (2.5M) | $4M | $(12M) |
| Rate option #2b (Higher of market cost or production cost energy + current customer and delivery blended rate) | $0 with full upfront cost recovery* | $ (8M) | $ (5M) (production rate) | $ (8M) |

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# Comments/Questions?

# Public Comment Period

# Rate Discussion Next Steps

- March 7
  - No new HDL information planned
- March 21
  - Continued comment opportunity
  - Seek guidance on rate design options
  - Seek guidance on upfront system impact fees
  - Seek guidance on rate implementation options

# Moratorium Timeline Options

## If Board chooses to implement rates and upfront charges

<u>Go Forward Now</u>

- June 6, 2016
  - Final rate decision
- Summer 2016
  - Implement upfront system impact fees
- October 3, 2016
  - Rate implementation target
  - Moratorium lifted

<u>Delay</u>

- Review internal and external economic development studies by year-end 2016
- March 6, 2017
  - Final rate decision
- Summer 2017
  - Implement upfront system impact fees
- July 5, 2017
  - Rate implementation target
  - Moratorium lifted



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# Appendix

# Staff Proposed Rate Class

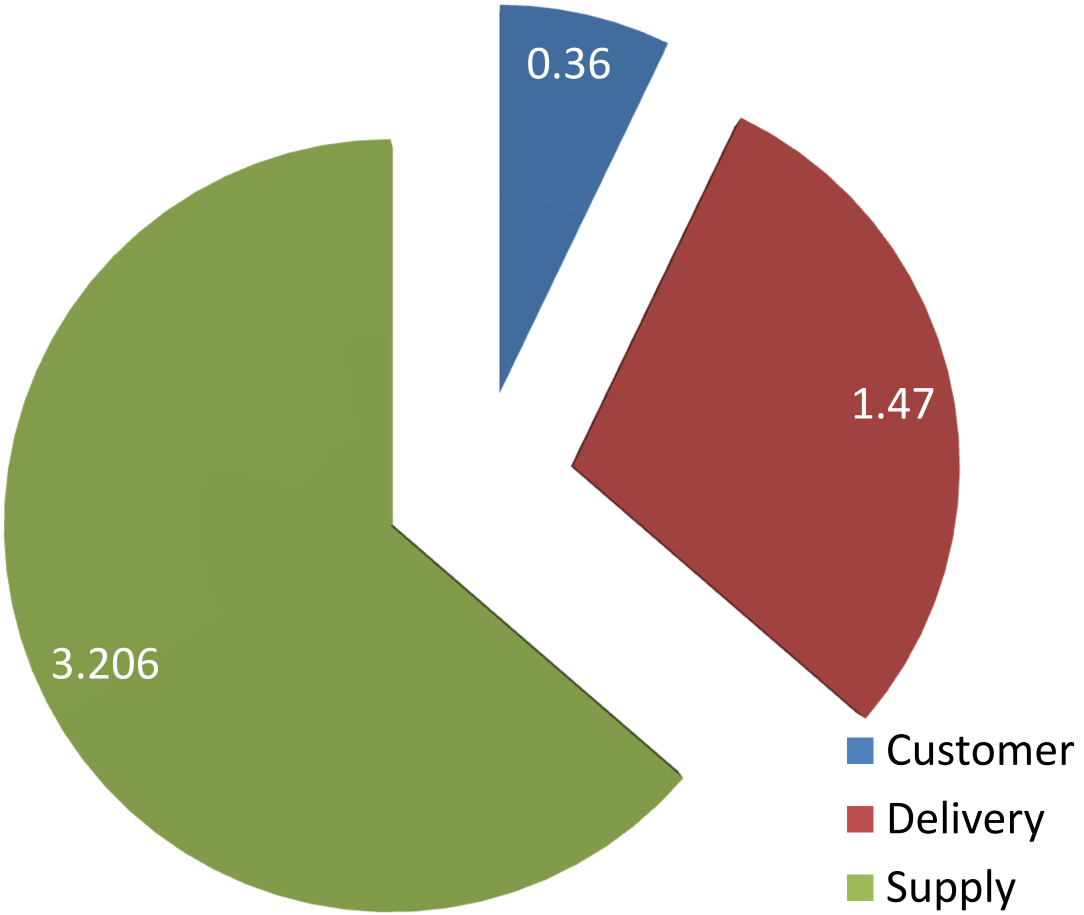
<u>High Density Load</u>

This schedule applies to server farms and similar technological operations. An entity otherwise subject to this rate schedule will be excluded from this schedule if the entity demonstrates to the District's reasonable satisfaction, or the District determines on its own initiative, that the EUI of the subject facility is less than 250 $kWh/ft^2/year$.

# Staff Proposed Rate Class Definitions

- "Energy Use Intensity" or "EUI" means the annual kilowatt-hours of Energy usage divided by the operating space square footage used by the Energy consuming activity as determined by the District.
- "Server farm" means an entity whose Energy use at the Point of Delivery serves mostly one or more computer server machines and any ancillary loads including HVAC, UPS, power systems, and lighting.
- The methodology for calculating EUI will be determined by the District. In developing and applying the methodology, the District may make reasonable assumptions and projections as necessary to estimate Energy usage and square footage based on the Customer's application, data regarding similar operations, and other sources.
- Applies to loads 5 aMW or less

# Initial Staff Proposed HDL Rate: 5.036¢/KWh



# Customer and Delivery Impact

| ***Forecast Scenarios with 100 aMW HDL Load*** | **2017** | **2018** | **2019** | **2020** | **2021** | **2022** | **2023** | **2024** | **2025** | **2026** | **2027** |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **Current Rates (Blended Commercial/Industrial)** | | | | | | | | | | | |
| Customer and Delivery Revenue (0.78 cents/KWh) | $ 1,367 | $ 2,733 | $ 4,100 | $ 5,466 | $ 6,833 | $ 6,833 | $ 6,833 | $ 6,833 | $ 6,833 | $ 6,833 | $ 6,833 |
| Capital | $ (11,000) | $ (11,000) | $ (11,000) | $ (11,000) | $ (11,000) | $ - | $ - | $ - | $ - | $ - | $ - |
| O&M | $ (2,900) | $ (5,800) | $ (8,700) | $ (11,600) | $ (14,500) | $ (14,500) | $ (14,500) | $ (14,500) | $ (14,500) | $ (14,500) | $ (14,500) |
| | **$ (12,533)** | **$ (14,067)** | **$ (15,600)** | **$ (17,134)** | **$ (18,667)** | **$ (7,667)** | **$ (7,667)** | **$ (7,667)** | **$ (7,667)** | **$ (7,667)** | **$ (7,667)** |
| **Existing COSA Rate** | | | | | | | | | | | |
| Customer and Delivery Revenue (1.83 cents/KWh) | $ 3,206 | $ 6,412 | $ 9,618 | $ 12,825 | $ 16,031 | $ 16,031 | $ 16,031 | $ 16,031 | $ 16,031 | $ 16,031 | $ 16,031 |
| Capital | $ (11,000) | $ (11,000) | $ (11,000) | $ (11,000) | $ (11,000) | $ - | $ - | $ - | $ - | $ - | $ - |
| O&M | $ (2,900) | $ (5,800) | $ (8,700) | $ (11,600) | $ (14,500) | $ (14,500) | $ (14,500) | $ (14,500) | $ (14,500) | $ (14,500) | $ (14,500) |
| | **$ (10,694)** | **$ (10,388)** | **$ (10,082)** | **$ (9,775)** | **$ (9,469)** | **$ 1,531** | **$ 1,531** | **$ 1,531** | **$ 1,531** | **$ 1,531** | **$ 1,531** |

**Key Assumptions**

-Forecasted results represent the incremental change in service revenues and cost associated with HDL load coming online

-New HDL load assumed to come online 20 aMW per year in 2017 -2021

-Initial Rates applied in 2017 remain constant throughout the analysis

**Note: Values presented provide a rough estimate. Actual costs would vary. Cost of capital not expressly addressed in these values.**

# Forecasted Impacts – 100 aMW of HDL Load

**Chelan County PUD**
**Forecasted Impacts - 100 aMW of HDL LOAD**
**Retail Energy vs Wholesale Energy ($K)**

| **HDL Load** | | ***20 aMW*** | ***40 aMW*** | ***60 aMW*** | ***80 aMW*** | ***100 aMW*** | ***100 aMW*** | ***100 aMW*** |
|---|---|---|---|---|---|---|---|---|
| | **Rate Cents/KWh** | **2017** | **2018** | **2019** | **2020** | **2021** | **Low Market Rate** | **High Market Rate** |
| ***Forecast Scenarios with 100 aMW HDL Load Phased In*** | | | | | | | | |
| **Wholesale Value (Value of most recent slice product)** | 3.21 | $ (5,624) | $ (11,248) | $ (16,872) | $ (22,496) | $ (28,120) | $ (21,287) | $ (37,405) |
| **Retail Sales Revenue from Energy Component** | | | | | | | | |
| Current Rates (Blended Commercial/Industrial) | 2.06 | $ 3,609 | $ 7,218 | $ 10,827 | $ 14,436 | $ 18,046 | $ 18,046 | $ 18,046 |
| Market Energy Rate (Value of most recent slice product) | 3.21 | $ 5,624 | $ 11,248 | $ 16,872 | $ 22,496 | $ 28,120 | $ 28,120 | $ 28,120 |
| Production Cost Rate | 2.74 | $ 4,800 | $ 9,601 | $ 14,401 | $ 19,202 | $ 24,002 | $ 24,002 | $ 24,002 |
| **Net Energy Impact (Wholesale vs Retail)** | | | | | | | | |
| Current Rates (Blended Commercial/Industrial) | | $ (2,015) | $ (4,030) | $ (6,044) | $ (8,059) | $ (10,074) | $ (3,241) | $ (19,360) |
| Market Energy Rate (Value of most recent slice product) | | $ - | $ - | $ - | $ - | $ - | $ 6,833 | $ (9,286) |
| Production Cost Rate | | $ (823) | $ (1,647) | $ (2,470) | $ (3,294) | $ (4,117) | $ 2,716 | $ (13,403) |

**Key Assumptions**
-Forecasted results represent the incremental change in service and wholesale revenues associated with HDL load coming online
-20 aMW per year of new HDL load assumed to come online starting in 2017
-Initital Rates applied in 2017 remain constant throughout the analysis

| | Delivery | Energy | Expected | Low range | high range |
|---|---|---|---|---|---|
| Current Ra | $ (7,700) | $ (10,074) | $ (17,774) | $ (10,941) | $ (27,060) |
| Option 1 | $ 1,500 | $ - | $ 1,500 | $ 4,216 | $ 1,500 |
| Option 2a | $ 1,500 | $ (4,117) | $ (2,617) | $ 4,216 | $ (11,903) |
| Option 2b | $ (7,700) | $ - | $ (7,700) | $ (4,984) | $ (7,700) |

| | Cents/KWh |
|---|---|
| Low Market Rate | 2.43 |
| High Market Rate | 4.27 |

**Note: Values presented provide a rough estimate. Actual costs would vary. Cost of capital not expressly addressed in these values.**