Cryptocurrency Zoning & Planning Discussion - UPDATE

Andy Wendell – Director of Customer Services
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<th>Outreach Discussions on Cryptocurrency Zoning</th>
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<td>Joint Agency Planning</td>
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<tr>
<td>City of Wenatchee</td>
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<td>Port District</td>
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<td>City of Leavenworth</td>
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What we are hearing through outreach

- Establishing proper zoning for cryptocurrency mining is a County and municipal responsibility.
- Cryptocurrency mining in residential spaces introduces unique safety and reliability concerns in neighborhood electrical grids.
- Cryptocurrency mining is an Industrial / Commercial use of electricity.
- Cryptocurrency mining is best served in Industrial / Commercial zones.
- PUD should ensure electrical capacity for traditional non-crypto mining growth.
Examples of Questions from the City Planning Commission:

1. What is the PUD’s opinion on cryptocurrency mining in residential areas/neighborhoods?

2. Is there a threshold or minimum amount of cryptocurrency mining that can safely occur in a residence without significant upgrades to service or power consumption?

3. Is there sufficient power reserved for residential and commercial/industrial growth?
If traffic volume in the City increased to $5x$ times what it is today...

What would you do?
100 Watt

Turned on for (1 hour) = 100 WattHour

1,000 Watts

Turned on for (1 hour) = 1,000 WattHour = 1 KiloWattHour (1 Kwh)
30 days x 24 hrs = 720 hour / Month

Average Monthly Usage = ~ 1,660 KiloWattHours

or

(1,660 KWhs)

Wenatchee Residential Service

Cost: (1,660 KWhs) x ($0.032/KWh) = $53.12 / Month
1,200 Watts or 1.2 KW

Turned on for (1 hour) =
1,200 WattHour
or
1.2 KiloWattHour
(1.2 Kwh)

(1) ASIC Miner
1,200 Watts or 1.2 KW

Turned on for (1 hour) =
1,200 WattHour
or
1.2 KiloWattHour
(1.2 Kwh)
Average Monthly Usage = ~ 1,660 KiloWattHours
(720 Hours)

Wenatchee Residential Service

Cost: (1,660 KWhs) x ($0.032/KWh) = $53.12 / Month

(2) ASIC Miner

24 x7 Monthly Usage = 1,728 KiloWattHours
(720 Hours)

(2) X (1,200 Watts) = 2,400 Watts
(1,728 KWhs)
Typical (residential) Cryptocurrency Operation

> (10) ASIC Miner

24 x 7 Monthly Usage

(720 Hours)

= 8,640 KiloWattHours

or

(8,640 KWhs)

(10) X (1,200 Watts) = 12,000 Watts

5 x (Typical residential home usage)
Typical Street Development

- 15 Residential Homes
- (5) Shared Transformers,
- Typical Urban underground distribution system
Typical Street Development With (1) Typical Mining Operation

- Equivalent of 15-20 Residential Homes
- Requires at least (2 New Transformers)
- New Secondary Supply Cables
- Replacement & Upgrading of the primary cable

Equivalent to adding 5 additional homes
City of Wenatchee (Existing Transmission & Substations)

(10) Substations
(15 Miles of Transmission)
(205 Miles of Distribution Cable)
(3,700 Transformers)

Provide Electrical Service to ~ 15,865 Meter Endpoints
>
$650 Million in assets
If Cryptocurrency load is **centralized** & zoned similar as Industrial

Electrical infrastructure impacts are limited to the specific Industrial/Crypto zoned areas
If Cryptocurrency load is *De-Centralized* & allowed in residential zoned areas, electrical infrastructure impacts would be far more extensive & costly.
If Cryptocurrency load is **De-Centralized** & allowed in residential zoned areas:

- Adding neighborhood Substations
- Upgrading existing transformers
- Adding High voltage Transmission
- Upgrading existing neighborhood Distribution lines

**Material Change to Current Cost Models**
General Questions from the City Planning Commission:

1. What is the PUD’s opinion on cryptocurrency mining in residential areas/neighborhoods?

2. Is there a threshold or minimum amount of cryptocurrency mining that can safely occur in a residence without significant upgrades to service or power consumption?

3. What is the PUD’s legal obligation to provide power?

4. Can the PUD simply deny service to cryptocurrency miners?

5. What are the fees/rates applied to cryptocurrency mining?

6. What is the public benefit vs the power consumed?

7. Is there sufficient power reserved for residential and commercial/industrial growth?
Q1: What is the PUD’s opinion on cryptocurrency mining in residential areas/neighborhoods?

A: CCPUD has significant concerns with safety, reliability and the overall costs associated with the potential change in how we plan, build and maintain residential electrical systems that support cryptocurrency mining. We are basing these concerns on facts, findings, and reoccurring patterns relating to cryptocurrency mining in residences. We know that local area residential electrical systems in Wenatchee are not designed for sustained high density, high load factor electrical consumption like cryptocurrency mining. Allowing cryptocurrency mining in residential zoned areas will materially change costs in addition to the way the PUD plans, constructs, and maintains the residential electrical services.
Residential supply cable to a home failed due to a Cryptocurrency operation, resulting in a fire.
Q2: Is there a threshold or minimum amount of cryptocurrency mining that can safely occur in a residence without significant upgrades to service or power consumption?

A: Electrical capacity is unique to each individual home. Safety of the electrical equipment goes beyond the utility’s meter. Residential building codes and electrical codes should be considered as the primary standard for safe use of electricity in a residential home. The job of the utility is to ensure the supply transformer, supply cable and meters are properly sized and used for the approved electrical service. All non-residential load such as cryptocurrency should be reviewed and approved by the Department of Labor and Industries Electrical Division prior to use.
Q3: What is the PUD’s legal obligation to provide power?

A: The PUD, as the electric utility in the county, meets reasonable requests for power. The obligation to provide power is not absolute or unconditional. The PUD and state and local law place conditions and restrictions on service. Examples include appropriate rates and conditions of service, making necessary improvements so that service is safe, proper permitting, inspection and other similar requirements. For example, the PUD requires applicants to pay the cost of necessary line extension construction before it will provide power. The PUD’s policies and regulations are established and directed by the Board of Commissioners through PUD rates, policies, and regulations and are designed in part to protect the PUD and its customers and to maintain safe, reliable, and cost-effective service in the long-term.
Q4: Can the PUD simply deny service to cryptocurrency miners?

A: We assume the question intends to inquire about a blanket prohibition against serving under any circumstances. As a general matter the PUD denies service only for reasons related to non-compliance with its procedures, requirements or other applicable laws, such as failing to complete the application process or failing to pay a fee. In and of itself, what the consumer intends to do with the electrical power is generally not something the PUD considers in determining whether to deny service, with the potential exception of an intended unlawful service. Instead, what a consumer intends to do is important to conditions of service such as determining the right rate, impacts on the utility infrastructure and the safe and reliable provision of service. For example, the PUD would deny (or at least suspend) service to an electrically unsafe structure (e.g., with visibly dangerous wiring) or without L&I inspection. When a service request presents new and unique challenges, such as with cryptocurrency, the PUD seeks to develop reasonable terms and conditions of service, consistent with the policy of the Board of Commissioners, that protect the District and the District’s other customers rather than deny service outright.
Q5: What are the fees/rates applied to cryptocurrency mining?

A: Below are clips from the July 23rd, 2018 CCPUD Board of Commission update. These are draft and not approved at this time:

**Cryptocurrency Upfront Capital Charge**

<table>
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<th>Transmission Costs</th>
<th>Distribution Costs</th>
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<td>$55/kW (first 100 MW) in Wenatchee corridor (Monitor, Olds Station, Wenatchee, Malaga)</td>
<td>$270-388/kW depending on substation capacity</td>
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<td>No connections allowed north of Leavenworth (Anderson Canyon-Summit Line)</td>
<td>Where substation capacity not available customer may be required to build necessary infrastructure</td>
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<td>$400/kW - $500/kW in all other areas, or cost based on Transmission Study</td>
<td>Willingness to pay does not guarantee service availability</td>
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**Draft Cryptocurrency Rate Considerations**

- For use over 1 MW, at market monthly average index energy price over the last 24 months, averages 5.5 ¢/kWh*
- For use over 1 MW, at 5-yr future market energy, approx. 6 ¢/kWh* for commercial or industrial services
- For residential services, recommend adjusting delivery charge, resulting in 7-10 ¢/kWh*
- Excess use charges apply for incidental use over authorized levels

*Includes customer charge, delivery and energy, does not include upfront charges
Q5: What is the public benefit vs the power consumed?

A: There have been many debates as to the “benefits” and “risks” of cryptocurrency and blockchain technology. What we do know is that cryptocurrency mining places new stresses on the electrical utility systems and is accelerating the need to build more infrastructure and make costly upgrades to existing infrastructure.

In terms of cryptocurrency mining, the PUD is looking for solutions that result in a positive or neutral impact to our existing customers.
Q6: Is there sufficient power reserved for residential and commercial/industrial growth?

A: The PUD continuously updates a five year look forward and plans to be able to serve local organic (non-crypto) load growth over that horizon. And our current rates and policy development are designed to assure we do not inhibit future organic load growth at currently planned levels.