

# **An Hour, A Day, A Month in the Life of a BPA Load Following Customer**

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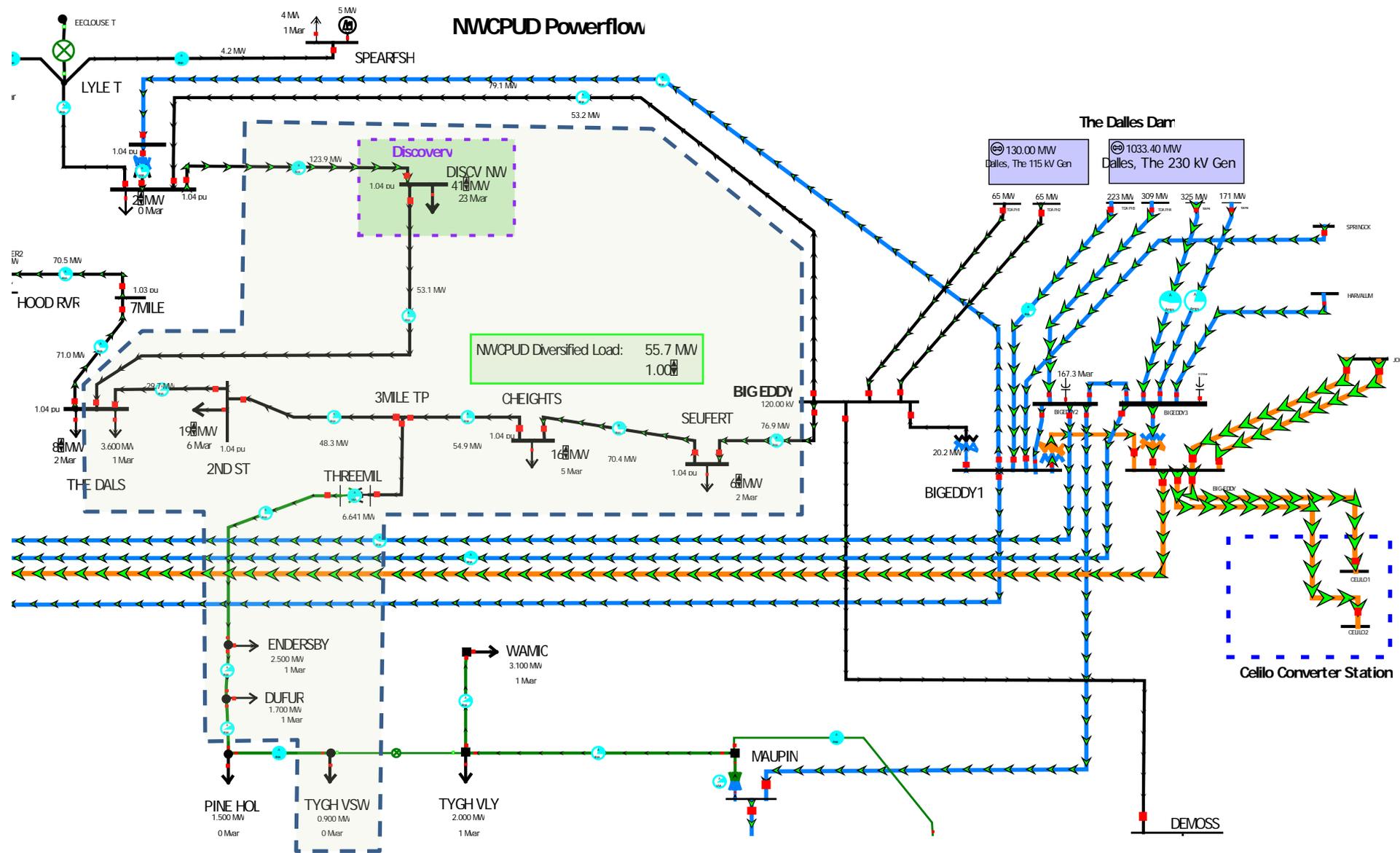
# Profile of NWCPUD

- NWCPUD serves 9,900 retail customers in Northern Wasco County
- Load Following PF Customer – BPA Balances Load Variations
- FY16 TRL = 83.715 aMW
- FY16 RHWM = 64.133 aMW
- 1 Existing Resource – McNary Fishway 50% Share = 4.404 aMW
- ARHWM = 15.178 aMW
- 1 New Non-Federal Resource: 15 MW market purchase
- 5 MW hydro at The Dalles Fishway: output sold to PGE LTF
- Five member governing board that sets policy and rates

# Transmission

- BPA NT Customer
  - Dedicated Network Resources at MNF and MIDC
  - Scheduled using the ISAAC Portal (BPAP)
- PTP Reservation for TDF: 6 MW
- Real Power Losses Provided by BPA Power through enabling agreement and confirm
- NWCPUD owns 115 and 69 kV transmission lines
  - Provides transfer service for BPAP
  - Receives revenue from BPAT for use of 115 kV backbone as network facilities

# NWCPUD Powerflow



## The Dalles Dam

130.00 MW  
Dalles, The 115 kV Gen

1033.40 MW  
Dalles, The 230 kV Gen

NWCPUD Diversified Load: 55.7 MW  
1.00 pu

## Cello Converter Station

# Before Operations: Long-Term Planning

- Planning establishes the framework that all short-term operations are conducted to implement or augment
- BPA-NWCPUD Power Sales Agreement, circa 2009
  - Until the BP-16 RHWM process, life was only slightly more complicated than the typical PF customer
  - For BP-16, Net Requirement exceeded RHWM
  - Firm, flat power purchases used to meet ARHWM requirements started on October 1, 2015
  - Potential for NLSLs exists – looking at the new NR rate ESS provisions
  - May embark on VER acquisitions, but not in the near-term
- BPA Transmission
  - NT Agreement with multiple Transmission Service Requests
  - Paths:
    - BPA Power to NWCPUD NT Load
    - Non-Federal Resources to NWCPUD NT Load
    - PTP reservation for sale of The Dalles Fishway output
  - NAESB Electric Industry Registry (EIR) entries: NWC, NWC01, NWCTDF, Sources and Sinks

# A Month...

- BPA Bill Reconciliation
  - A discipline that all customers need to develop
  - Knowing the derivative of every billing determinant is essential for long and short-term resource and financial planning
- Load resource schedules in the Integrated Scheduling Allocation After-the-Fact Calculation (ISAAC) Portal
  - Creates frag tags on the load side that are completed by the Non-Federal resource
  - Component of Transmission Scheduling Services (TSS) in Exhibit F of the BPA Power PF agreement

# A Day...

- Preschedule days are important
  - Non-Federal generating resources that are variable need to be adjusted to expected values
  - BPA Transmission requires Customer Data Entry (CDE) generation estimates
  - Alarms occur in preschedule and real-time for deviations or missing gen estimates
- Done right and Real-Time should be uneventful!
  - Forced outages are the exception

# An Hour...

- If the Long-Term, Monthly and Daily planning are done well, the hours are only disrupted by unscheduled events
  - Availability factors for NWCPUD's hydro units are typically higher than 98%
  - Plants trip for abnormal conditions
    - Forced outages are handled by on-site operators during business hours and on-call operators after business hours.
    - CDE and e-Tag quantities may need to be adjusted to minimize generation imbalances

# Prospective Issues

- Energy Efficiency and Conservation
  - Conservation Potential v. NWPPCC expectation
- Demand Response – theory and practice
- Distributed Generation – solar roofs or community solar? February 2014
-  **bitcoin**  **OREGON MINES**  
BUILDING BETTER MINES
- Marijuana Grow Operations

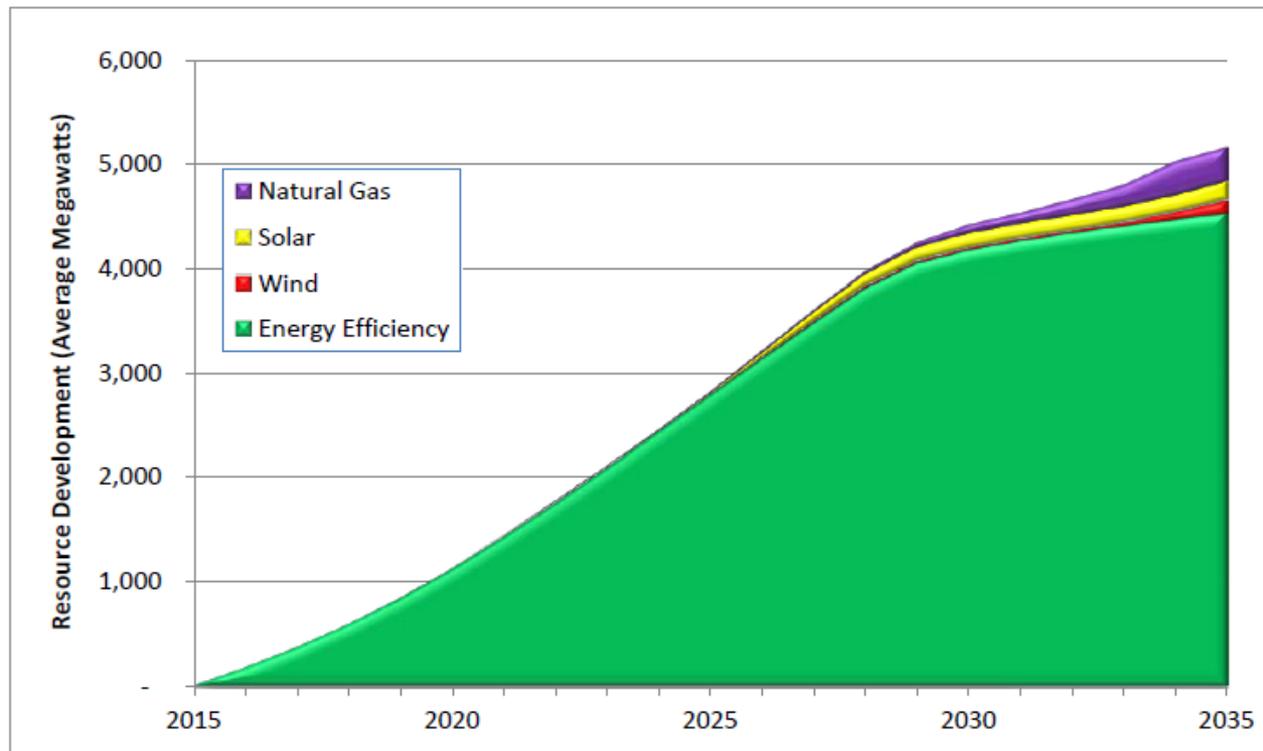


# NWPCC 7<sup>th</sup> Plan Energy Efficiency

- 1,400 aMW by 2021
- 3,100 aMW by 2026
- 4,500 aMW by 2035

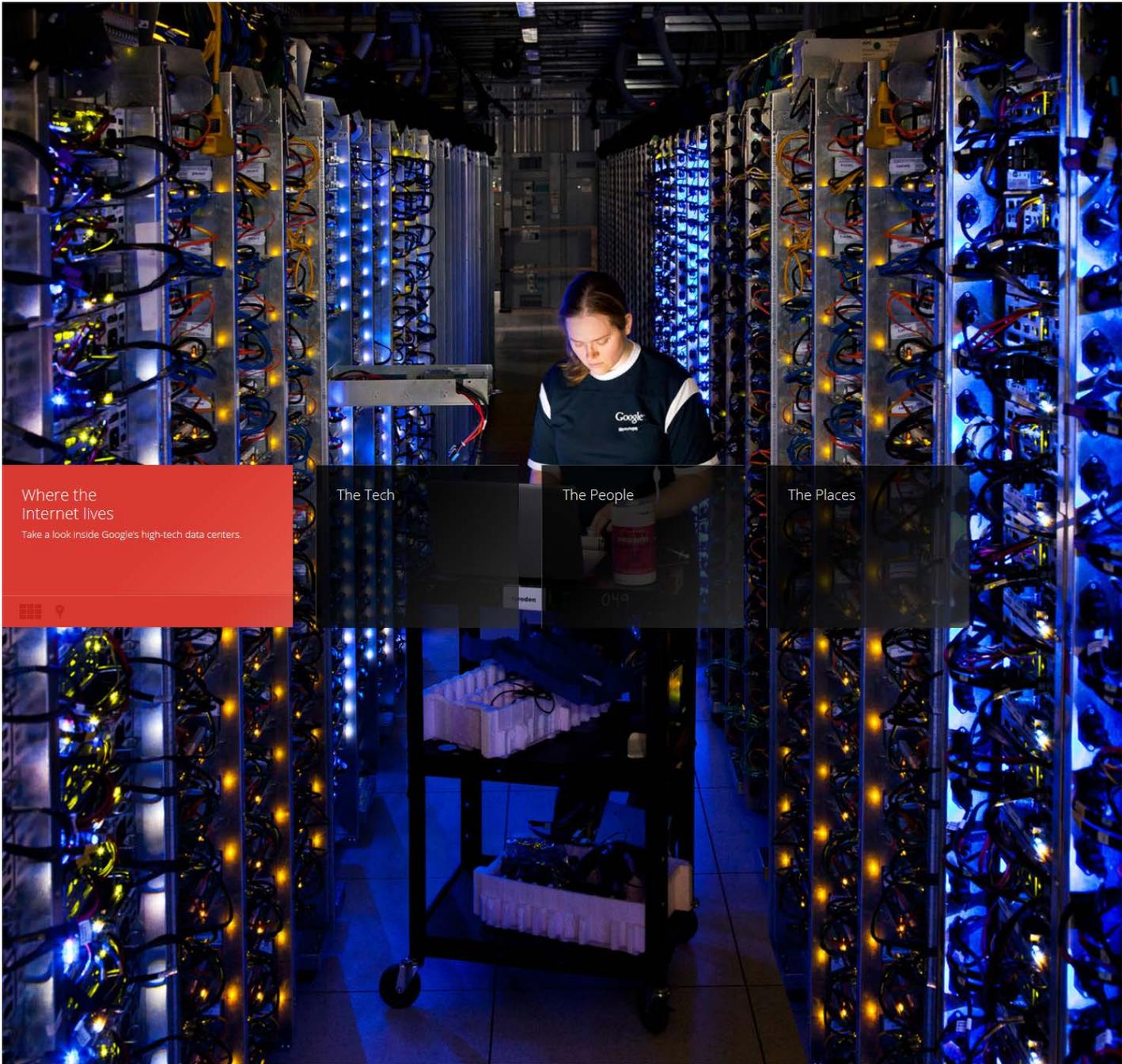
That's about 25% of the total regional load that we need to avoid through EE.

Figure 1 - 1: Seventh Plan Resource Portfolio<sup>1</sup>



# *bitcoin* Data Centers





Where the Internet lives  
Take a look inside Google's high-tech data centers.

The Tech

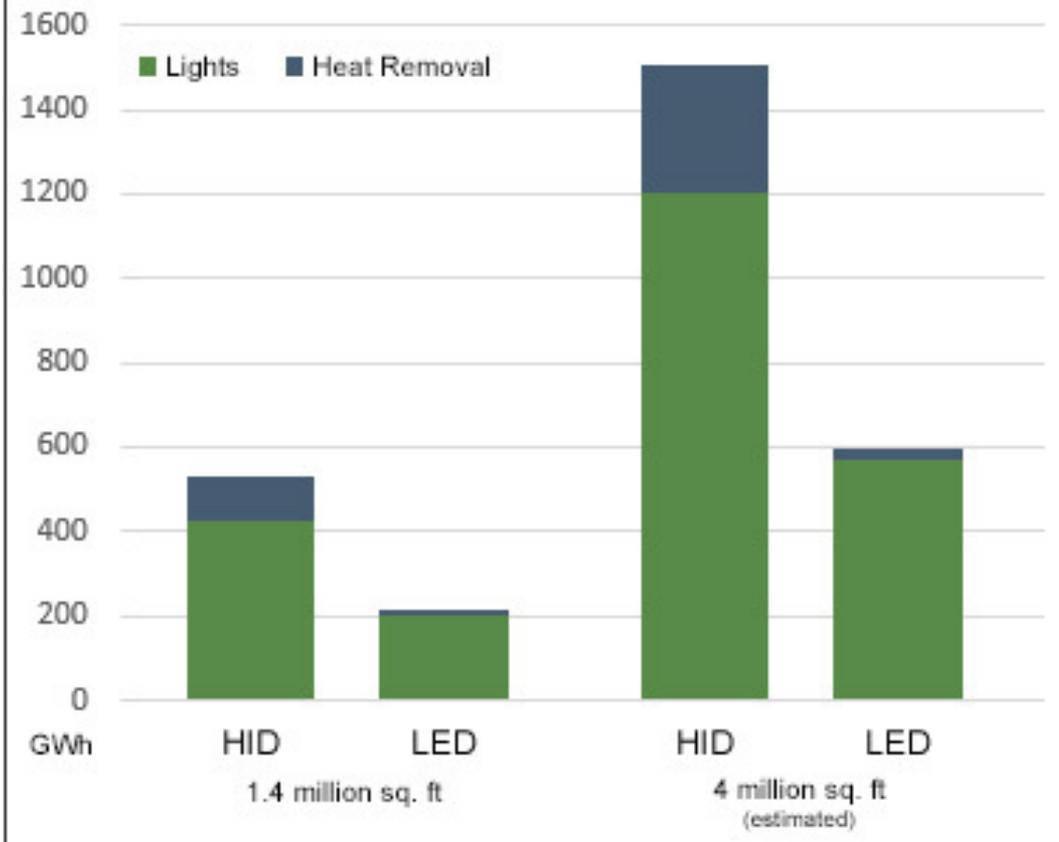
The People

The Places

# Marijuana Grow Operations



## How Much Electricity Does Legal Marijuana Growing Use in Washington State?



This graph projects the electricity needs of cannabis cultivation in Washington state, comparing the use of high-intensity discharge lights (HID) versus light-emitting diodes (LED). Green is the electricity used to power lights; blue is the electricity used by fans and air conditioners to remove heat. Further, it compares the current square footage of legal marijuana canopy (1.4 million square feet) versus a conservative estimate of how much canopy it will grow in the future (4 million square feet). Data courtesy of Lighting Science Group.

# New Rules and Regulations

- EPA 111(b) and (d) aka “Clean Power Plan”
  - NWCPUD has very little exposure to 111(d) rules governing existing fossil fueled plants.
  - Under 111(b), governing new plants:
    - Can a Load Following customer consider natural gas plants (IC, CT, CCCT) as a future resource?
    - Does nuclear power have a future in this context?
- FERC, WECC and NERC
  - Hydro licensing
  - Deregistration: TO be or not TO be?
  - BPA’s role as the TO, TP, TOP and all round BA

# BPA Past, Present and Future

- You gotta love 'em
- Guidance through the months, days and hours
- Future Concerns:
  - Rate competitiveness
  - New ventures NWPP MC, ISO EIM
  - Fisheries
  - Loss of human capital, retirements,
  - Aging system: hydro, transmission, controls

# Oversupply Quagmire – Does it ever end!

