



# POWER PRODUCTION AT THE PORTLAND HYDROELECTRIC PROJECT

The Bureau of Hydroelectric Power's Portland Hydroelectric Project (PHP) has been generating power with its two powerhouses in the Bull Run watershed and then selling that power to Portland General Electric (PGE) since the early 1980s. At the PHP, the long term annual average amount of energy that is generated from the project's two powerhouses totals a little more than 85,600,000 kWh (kilowatt hours) per year. In PGE's power distribution system, it is estimated that their residential customers use an average amount of energy of about 10,384 kWh / year. That would mean that, on average, the City's Portland Hydroelectric Project meets the electricity needs of about 8,240 Portland area households every year.

Over the full history of the PHP's operations from 1982 through 2011, this project has produced a total of over 2.5 billion kWh of renewable energy for use in the Portland area. To produce that amount of energy from a coal plant, it would have to burn 1.01 million tons of coal (over 9,700 train cars full) and release over 2.6 million tons of CO2 into the atmosphere.

The PHP's average amount of daily power generation during each of the months from November through April are actually very similar to each other as they reflect the region's normal winter time rainy season. Average power generation in the months of May and June lessens as the area's rainy season lets up. Then, during the months of July through October, daily power generation at the PHP is quite a bit less than that of the winter period.





For any individual year, the total energy generated at the PHP can vary quite a bit depending on:

- The total amount of rain that fell in the Bull Run watershed during that year;
- Whether that rain came in smaller distinct rain storms where all or most of the resulting stream flow passed through the powerhouse turbines, or in very large storms where large amounts of stream flow, in excess of the turbines maximum capacity, was pushed over the dam's spillways;
- How much of the winter rainfall was stored as snowpack in the upper elevations of the Bull Run watershed to be released as additional stream flow in the spring season;
- Whether the PHP's generating equipment and power transmission lines were operable and available to produce power when the stream flow was available.

# The following are the PHP's annual energy generation and rainfall amounts from 2000 through late-2011 (references to average amounts refer to the period from 1984 – 2011):

From January through September of calendar year 2011:

#### Total 9-month PHP Energy Generation = 73,374,000 kWh (118% of ave.)

- Total 9-month rainfall at PHP Powerhouse No. 2 = 57.9 inches (118% of ave.)
- A very rainy February May made this 9-month period of power generation well above normal.

#### Total PHP Energy Generation during Calendar Year 2010 = 98,827,000 kWh (115% of ave.)

- Total annual rainfall at PHP Powerhouse No.2 = 90.3 inches (116% of ave.)
- 2010 was the fourth wettest year in this 28-year period

### Total PHP Energy Generation during Calendar Year 2009 = 91,084,000 kWh (106% of ave.)

- Total annual rainfall at PHP Powerhouse No.2 = 72.7 inches (93% of ave.)
- Bull Run watershed had one of the largest snow packs in the last 25 years

## Total PHP Energy Generation during Calendar Year 2008 = 103,020,000 kWh (120% of ave.)

- Total annual rainfall at PHP Powerhouse No.2 = 77.9 inches (100% of ave.)
- Bull Run watershed had the all time record high Springtime snow pack

### Total PHP Energy Generation during Calendar Year 2007 = 74,806,000 kWh (87% of ave.)

• Total annual rainfall at PHP Powerhouse No.2 = 75.7 inches (97% of ave.)

#### Total PHP Energy Generation during Calendar Year 2006 = 87,780,000 kWh (103% of ave.)

- Total annual rainfall at PHP Powerhouse No.2 = 84.7 inches (109% of ave.)
- Two months with very high rainfall amounts leading to large spillway flows

## Total PHP Energy Generation during Calendar Year 2005 = 66,877,000 kWh (78% of ave.)

• Total annual rainfall at PHP Powerhouse No.2 = 72.6 inches (93% of ave.)

# Total PHP Energy Generation during Calendar Year 2004 = 81,688,000 kWh (95% of ave.) Total annual rainfall at PHP Powerhouse No.2 = 70.9 inches (91% of ave)

# Total PHP Energy Generation during Calendar Year 2003 = 86,944,000 kWh (102% of ave.) Total annual rainfall at PHP Powerhouse No.2 = 81.8 inches (105% of ave.)

## Total PHP Energy Generation during Calendar Year 2002 = 74,997,000 kWh (88% of ave.)

• Total annual rainfall at PHP Powerhouse No.2 = 60.8 inches (78% of ave.)

## Total PHP Energy Generation during Calendar Year 2001 = 73,408,000 kWh (86% of ave.)

• Total annual rainfall at PHP Powerhouse No.2 = 72.5 inches (93% of ave.)

## Total PHP Energy Generation during Calendar Year 2000 = 77,791,000 kWh (91% of ave.)

• Total annual rainfall at PHP Powerhouse No.2 = 65.4 inches (81% of ave.)