KEY DEFINITIONS AND ACRONYMS

| **Abbreviation** | **Meaning** |
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| ACE | Area Control Error |
| AECO | Alberta Energy Company, a natural gas hub in Alberta, Canada |
| AFUDC | allowance for funds used during construction |
| AGC | automatic generation control |
| AIM | Area Investment Model, used to calculate financial performance indicators for projects. |
| aMW | The average number of megawatt-hours (MWh) over a specified time period; for example, 175,200 MWh generated over the course of one year equals 20 aMW (175,200 / 8,760 hours). |
| AOC | Administrative Order Of Consent |
| AURORA | One of the models PSE uses for integrated resource planning. AURORA uses the western power market to produce hourly electricity price forecasts of potential future market conditions. |
| BA | Balancing Authority, the area operator that matches generation with load |
| BACT | Best available control technology, required of new power plants and those with major modifications. |
| BART | best available retrofit technology, an EPA standard |
| balancing reserves | Reserves sufficient to maintain system reliability within the operating hour; this includes frequency support, managing load and variable resource forecast error, and actual load and generation deviations. Balancing reserves do not provide the same kind of short-term, forced-outage reliability benefit as contingency reserves, which are triggered only when certain criteria are met; balancing reserves must be able to ramp up and down as loads and resources fluctuate instantaneously each hour. |
| BcF | billion cubic feet |
| BOP | balance of plant, work inclusive of project substations, turbine foundations, collection system, roads and the operations and main building |
| BPA | Bonneville Power Administration |
| BSER | best system of emission reduction, an EPA standard |
| BTA | Best Technology Available |
| CAGR | compounded average growth rate |
| CAIR | Clean Air Interstate Rule |
| CAISO | California Independent System Operator |
| capacity factor | The ratio of the actual generation from a power resource compared to its potential output if it was possible to operate at full nameplate capacity over the same period of time.  |
| case | A set of assumptions designed to test the economic viability of an existing resource under a variety of regulatory conditions. |
| CARB | California Air Resources Board |
| CCCT | combined cycle combustion turbine  |
| CCR | coal combustion residuals |
| CCS | carbon capture and sequestration |
| CEC | California Energy Commission |
| CFL | compact fluorescent light |
| CI | confidence interval |
| CNG | compressed natural gas |
| CNGC | Cascade Natural Gas Corporation |
| CO2 | carbon dioxide |
| COE | U.S. Army Corps of Engineers |
| COL | construction and operating license |
| contingency reserves | Reserves added in addition to balancing reserves; contingency reserves are intended to bolster short-term reliability in the event of forced outages and are used for the first hour of the event only. This capacity must be available within 10 minutes, and 50% of it must be spinning. |
| Council | Northwest Power and Conservation Council |
| CPUC | California Public Utility Commission |
| CRAG | Conservation Resource Advisory Group |
| CSAPR | Cross State Air Pollution Rule  |
| CT | natural gas-fired combustion turbine |
| CT peaker | A natural gas-fired, simple-cycle combustion turbine used for meeting peak resource need (also simply referred to as a “peaker”)  |
| CVR | conservation voltage reduction |

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| demand-side resources | resources that originate on the customer or “demand” side of the meter, primarily involving different types of energy efficiency |
| demand-response | Demand-response resources are comprised of flexible, price-responsive loads, which may be curtailed or interrupted during system emergencies or when wholesale market prices exceed the utility’s supply cost. |
| DOE | Department of Energy |
| draw | simulation |
| DSO | dispatch standing order (BPA’s protocol to manage a growing amount of wind on its system) |
| DSR / DSM | demand-side resources, demand-side measures |
| Dth | dekatherms |
| EIA | U.S. Energy Information Agency |
| EIA | RCW 19.285, Washington’s state’s Energy Independence Act, also commonly known as Initiative 937, sets the state’s renewable portfolio standard (RPS). |
| EIM | Energy Imbalance Market. A voluntary, within-hour energy market operated by the California Independent System Operator (CAISO) that trades in very small increments such as 5 and 15 minutes.  |
| EISA | Energy Independence and Security Act |
| ELCC | equivalent load carrying capability |
| EPA | Energy Policy Act (2005) |
| EPA | Environmental Protection Agency |
| EPRI | Electric Power Research Institute |
| EPS | Washington state’s Emissions Performance Standard  |
| ESP | electric service provider |
| ESP | electro-static precipitator |
| EUE | Expected unserved energy, a reliability metric measured in MWhs focused on magnitude of electric service curtailment events (how widespread outages may be).  |
| FERC | Federal Energy Regulatory Commission |
| FIP | Federal Implementation Plan  |
| firm capacity | Firm pipeline transportation capacity carries the right, but generally not the obligation, to transport up to a maximum daily quantity of gas on the pipeline from a specified receipt point to a specified delivery point. Firm transportation requires a fixed payment, whether or not the capacity is used, plus variable costs when physical gas is transported. |
| GDP | gross domestic product |
| GHG | greenhouse gas |
| GPM | Gas portfolio model. PSE currently uses the SENDOUT model from ABB Ventyx as its GPM. |
| GRC | General Rate Case |
| GTN | Gas Transmission Northwest |
| HDD | heating degree days |
| Heat rate | a measure of the thermal efficiency of a power plant or generator |
| HHV | high heating value |
| HVAC | heating, ventilation and air conditioning |
| I-937 | Initiative 937, Washington state's renewable portfolio standard (RPS), a citizen-based initiative codified as RCW 19.285, Energy Independence Act. |
| ICE | Incremental capacity equivalent, the peak capacity contribution of a resource relative to that of a gas peaker. It is calculated as the change in capacity of a generic natural gas peaking plant that results from adding a different resource with any given energy production characteristics to the system while keeping the target reliability metric constant.  |
| iDOT | Investment Optimization Tool, to identify a set of projects that will create maximum value. |
| IGCC | Integrated gasification combined-cycle, generally refers to a model in which syngas from a gasifier fuels a combustion turbine to produce electricity, while the combustion turbine compressor compresses air for use in the production of oxygen for the gasifier. |
| IOU | investor owned utility |
| Interruptible capacity | See non-firm capacity. |
| IPP | Independent power producers  |
| IRP | Integrated Resource Plan |
| IRPAG | Integrated Resource Plan Advisory Group |
| ISO | independent system operator |
| KORP | the Kingsvale-Oliver Reinforcement Project (KORP) pipeline proposal sponsored by Fortis BC and Spectra |
| kV | kilovolt |
| kW | kilowatt |
| kWh | kilowatt hours |
| LADWP | Los Angeles Department of Water and Power |
| LBNL | Lawrence Berkeley National Laboratory |
| LNG | liquefied natural gas |
| load | the total generated demand plus planning margins and operating reserve obligations |
| LOLH | Loss of load hours, a reliability metric focused on the duration of electric service curtailment events (how long outages may last). |
| LOLP | Loss of load probability, a reliability metric focused on the likelihood of an electric service curtailment event happening.  |
| LP | linear program  |
| LP-Air | vaporized propane air |
| MATS | Mercury Air Toxics Standard |
| MDEQ | Montana Department of Environmental Quality |
| MDQ | maximum daily quantity |
| MDth | thousand dekatherms  |
| Mid-Columbia (Mid-C) market hub | The principle electric power market hub in the Northwest and one of the major trading hubs in the WECC, located on the Mid-Columbia River. |
| MMBtu | million British thermal units |
| MSTI | Northwestern Energy’s Mountain States Transmission Intertie |
| MW | megawatt |
| MWe | megawatts electric |
| MWh | megawatt hours |
| NAAQS | National Ambient Air Quality Standards, set by the EPA, which enforces the Clean Air Act, for six criteria pollutants: sulfur oxides, nitrogen dioxide, particulate matter, ozone, carbon monoxide and lead. |
| NARUC | National Association of Regulatory Utility Commissions |
| NEEA | Northwest Energy Efficiency Alliance |
| NEEDS | National Electric Energy Data System |
| NEPA | National Environmental Policy Act |
| NERC | North American Electric Reliability Council |
| net maximum capacity | The capacity a unit can sustain over a specified period of time – in this case 60 minutes – when not restricted by ambient conditions or deratings, less the losses associated with auxiliary loads. |
| NGV | natural gas vehicles |

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| Non-firm capacity | Non-firm service is subordinate to the rights of shippers who hold and use firm transportation capacity, hence it is “interruptible.” The rate for interruptible capacity is negotiable, and is typically billed as a variable charge. |
| NOS | Network Open Season, a BPA transmission planning process |
| NOx | nitrogen oxides |
| NPV | net present value |
| NRC | Nuclear Regulatory Commission |
| NREL | National Renewables Energy Laboratories |
| NSPS | New source performance standards, new plants and those with major modifications must meet these EPA standards before receiving permit to begin construction. |
| NUG | nonutility generator |
| NWGA | Northwest Gas Association |
| NWP | Northwest Pipeline (only pipeline directly to west WA) |
| NPCC | Northwest Power & Conservation Council |
| NWPP | Northwest Power Pool |
| NYMEX | New York Mercantile Exchange |
| OASIS | Open Access Same-Time Information System |
| OATT | Open Access Transmission Tariff |
| OFM | Washington state Office of Financial Management |
| OTC | once-through cooling |
| PCA | power cost adjustment (electric) |
| PCORC | power cost only rate case |
| peak capacity value | A measure of a resource’s ability to contribute to meeting peak need. |
| peaker | Natural gas-fired combustion turbine used for meeting peak resource need (also sometimes referred to as a simple-cycle combustion turbine, SCCT or CT peaker, or reciprocating engine).  |
| PEFA | ColumbiaGrid’s planning and expansion functional agreement, which defines obligations under its planning and expansion program  |
| PGA | purchased gas adjustment |
| PG&E | Pacific Gas & Electric |
| PGE | Portland Gas Electric |
| PIPES Act | Pipeline Inspection, Protection, Enforcement, and Safety Act (2006) |
| planning margin or PM | These are amounts over and above customer peak demand that ensure the system has enough flexibility to handle balancing needs and unexpected events.  |
| planning standards | The performance targets for a system’s operation. |
| PM | particulate matter |
| PNUCC | Pacific Northwest Utilities Coordinating Committee |
| portfolio | A specific mix of resources to meet gas sales or electric load. |
| PPA | Purchased power agreement, a bilateral wholesale or retail power short-term or long-term contract, wherein power is sold at either a fixed or variable price and delivered to an agreed-upon point. |
| PTP | Point-to-point transmission service, meaning the reservation and transmission of capacity and energy on either a firm or non-firm basis from the point of receipt (POR) to the point of delivery (POD). |
| PTSA | Precedent Transmission Service Agreement |
| PSE | Puget Sound Energy |
| PSIA | Pipeline Safety Improvement Act (2002) |
| PSM | Portfolio screening model, a model PSE uses for integrated resource planning, which tests electric portfolios to evaluate PSE’s long-term revenue requirements for those portfolios. |
| PSO | power supply operations |
| PTC | Production Tax Credit, a federal subsidy for production of renewable energy that applied to projects that began construction in 2013 or earlier. When it expired at the end of 2014, it amounted to $23 per MWh for a wind project’s first 10 years of production.  |
| PUD | public utility district |
| PV | photovoltaic |
| R&D | research and development |
| RAM | Resource Adequacy Model. RAM analysis produces reliability metrics (EUE, LOLP, LOLH) that allow us to asses physical resource adequacy. |
| RAS | remedial action scheme |
| rate base | The amount of investment in plant devoted to the rendering of service upon which a fair rate of return is allowed to be earned. In Washington state, rate base is valued at the original cost less accumulated depreciation and deferred taxes. |
| RCRA | Resource Conservation Recovery Act |
| RCW | Revised Code of Washington |
| RCW 19.285 | Washington’s state’s Energy Independence Act, commonly referred to as the state’s renewable portfolio standard (“RPS”) |

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| REC | Renewable energy credit, RECs are intangible assets that represent the environmental attributes of a renewable generation project – such as a wind farm – and are issued for each MWh of energy generated from such resources. |
| REC banking | Washington’s renewable portfolio standard allows for RECs unused in the current year to be “banked” and used in the following year.  |
| recip | Short for reciprocating engine, a small four-stroke gas engine that uses a lean burn method to generate power. Used as a peaker. |
| regulatory lag | The time that elapses between establishment of the need for funds and the actual collection of those funds in rates. |
| revenue requirement | Rate Base \* Rate of Return + Operating Expenses  |
| RFP | request for proposal |
| RPG | Renewable Portfolio Goal |
| RPS | Renewable portfolio standard. It requires electricity retailers to acquire a minimum percentage of their power from renewable energy resources. Washington state mandates 3% by 2012, 9% by 2016 and 15% by 2020.  |
| RTO | regional transmission organization |
| SCADA | supervisory control and data acquisition |
| SCCT | Simple-cycle combustion turbine, natural gas-fired unit used for meeting peak resource need (also sometimes referred to as a “peaker”) |
| SCR | selective catalytic reduction |
| scenario | A consistent set of data assumptions that defines a specific picture of the future; takes holistic approach to uncertainty analysis. |
| SENDOUT | PSE’s model used to help identify the long-term least cost combination of gas resources to meet stated loads. |
| sensitivity | A set of data assumptions based on the Base Scenario in which only one input is changed. Used to isolate the effect of a single variable. |
| SIP | State Implementation Plan |
| SNCR | selective non-catalytic reduction |
| SNL | A company that collects and disseminates corporate, financial and market data on several industries including the energy sector (www.snl.com). The letters SNL stand for savings and loan. |
| SO2 | sulfur dioxide |
| SOFA system | separated over-fire air system |

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| supply-side resources | Resources that originate on the utility side of the meter. Electric supply-side resources include primarily coal and gas-fired generation, hyro power and transmission. Gas supply-side resources include pipeline capacity and gas supplies.  |
| TAG | Technical Advisory Group |
| TailVar90 | A metric for measuring risk defined as the average value of the worst 10 percent of outcomes. |
| TEPPC | WECC Transmission Expansion Planning Policy Committee |
| TCPL-Alberta  | TransCanada’s Alberta System (also referred to as TC-AB) |
| TCPL-British Columbia | TransCanada’s British Columbia System (also referred to as TC-BC) |
| TF-1 | Firm gas transportation contracts, available 365 days each year. |
| TF-2 | Gas transportation service for delivery or storage volumes generally intended for use during the winter heating season only. |
| T&D | transmission and distribution |
| TOP | transmission operator |
| transport loads | In the gas utility, this refers to customers who buy gas supplies from PSE but transport those supplies using their own resources |
| transportation loads | The natural gas or electricity that is used to fuel vehicles like cars, trucks, boats and ships. |
| Treasury Grant | The Treasury Grant (“Grant) is a federal subsidy in the form of a cash payment that amounts to 30% of the eligible capital cost for renewable resources; it expires at the end of 2013. For projects placed in service in 2013, construction must have started in 2009, 2010 or 2011 and the project must meet eligibility criteria. |
| UPC | use per customer |
| VERs | Variable energy resources |
| VectorGas | facilitates the ability to model price and load uncertainty |
| WAC | Washington Administrative Code |
| WACC | weighted average cost of capital |
| WCI | Western Climate Initiative |
| WECC | Western Electricity Coordinating Council |
| WECo | Western Energy Company |
| WEI | Westcoast Energy, Inc. |
| WIEB | Western Interstate Energy Board |
| WUTC | Washington Utilities and Transportation Commission |