



RENEWABLE ENERGY STANDARD

WHAT DOES THE RENEWABLE ENERGY STANDARD (RES) REQUIRE?

(The RES statute is §40-2-124, C.R.S.)

- Retail electric service in Colorado is provided through three types of utilities:
 - Investor-Owned (Black Hills Energy and Public Service Co. of Colorado (dba Xcel Energy))
 - Municipal (overseen by city/town councils)
 - Cooperative Electric Associations (overseen by the members)
- The Investor-Owned Utilities (IOUs) must generate 30% of their retail electricity sales from renewable sources by 2020, meeting incremental goals along the way.
 - IOU's must receive at least 3% of retail sales from renewable "distributed generation." This is generation occurring on the premises of customers or at a Colorado renewable energy resource of 30 MW or less.
- Municipal Utilities and Cooperative Electric Associations must provide 10% of their retail electric sales from renewable sources by 2020.

HOW DOES A UTILITY COMPLY WITH THE RES?

- Compliance is measured relative to retail electricity sales, measured in Megawatt hours (MWh).
- A utility acquires Renewable Energy Credits (RECs) by adding qualifying generation to its system, purchasing energy from qualifying generators or purchasing RECs from other parties.
- One REC equals 1 MWh of production from a renewable generation resource. Renewable generation projects located in-state receive a multiplier of 1.25 when counting the output toward RES compliance.

HOW IS "RENEWABLE ENERGY" DEFINED?

- State statute defines the eligible energy resources for complying with the Renewable Energy Standard (RES) in two categories:
 - Renewable energy, which includes solar, wind, geothermal, biomass, and small hydropower
 - Recycled energy, which uses otherwise lost energy to generate electricity

WHAT DOES A 30% RES MEAN TO THE ELECTRIC SYSTEMS OF PUBLIC SERVICE AND BLACK HILLS?

- In 2011 Black Hills sold about 2.1 million MWh. Projected retail sales in 2020 are a few percent higher than 2011, thus 2020 compliance is likely to be in the range of 650,000 RECs for that year. In terms of MWh, that is a little less than the electricity used by the Loveland municipal utility (32,931 customers).
- In 2011 Public Service sold about 28.5 million MWh. Projected retail sales in 2020 are a few percent higher than 2011, thus 2020 compliance is likely to be in the range of 9 million RECs for that year. In terms of MWh, that is about twice the electricity used by the Colorado Springs Utility (211,188 customers).



RENEWABLE ENERGY STANDARD

WHAT OTHER CONDITIONS ARE PLACED UPON HOW UTILITIES COMPLY WITH THE RES?

- The maximum retail rate impact resulting from RES compliance allowed under § 40-1-124(1)(g), C.R.S. is two percent (2%).
 - The rate impact is calculated as the difference between the cost of the renewable energy purchases and the cost of new fossil fuel based energy to provide the same amount of energy.
 - To pay for this difference, Public Service and Black Hills collect funds through the Renewable Energy Standard Adjustment (RESA), a 2% surcharge on the electricity bill for all retail customers.

HOW IS PUBLIC SERVICE DOING IN ACHIEVING THE RES GOALS?

- In 2011, Public Service caused to be generated 4.5 million RECs. This is equivalent to 16% of its retail sales (20% when using the 1.25 in-state multiplier).
- Public Service's 2011 goal was 12%, which is about 3.4 million RECs. Since the 2011 RES goal for IOUs was 12%, Public Service has excess RECs, for which it has several options:
 - Sell them for profit; (most of the profits are returned to the ratepayers; in 2011 Public Service sold 1.7 million RECs.)
 - "Bank" them for compliance with the RES in future years; (RECs can be banked for up to 5 years, by PUC rule), or
 - Retire them to demonstrate compliance in excess of the RES

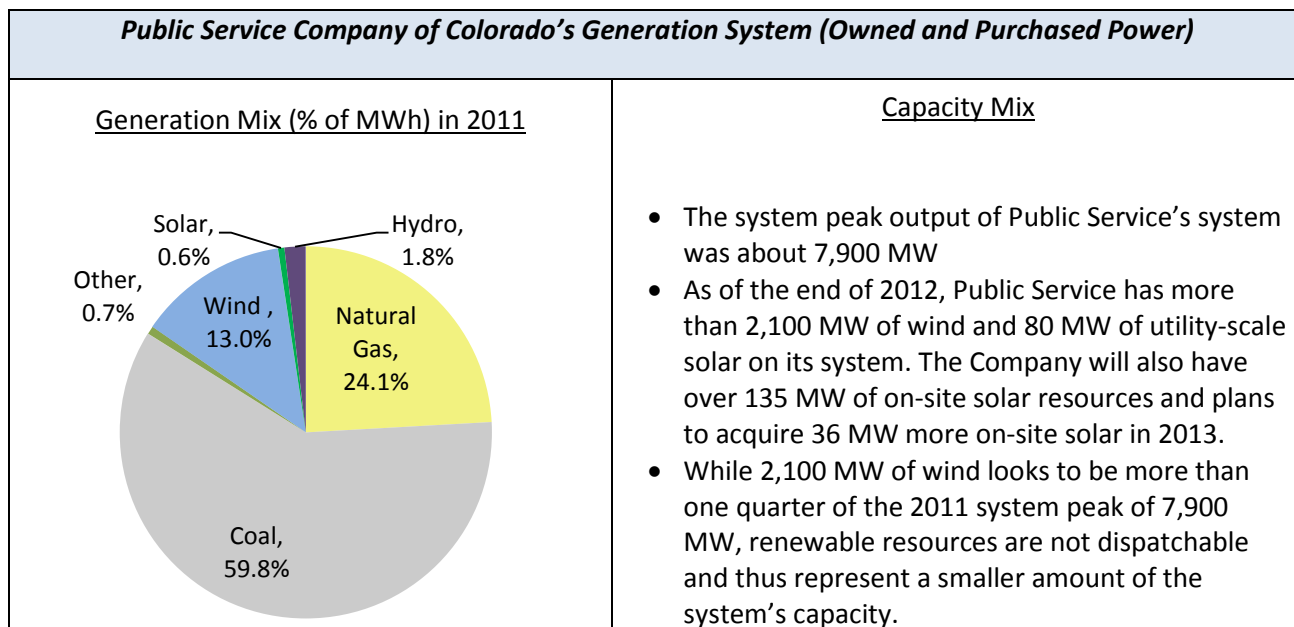
PUBLIC SERVICE AND RES COMPLIANCE: LOOKING OUT TOWARD 2020

- Early compliance with the RES has provided enough excess RECs to Public Service that it expects to be able to demonstrate compliance through 2028 without acquiring additional utility-scale wind or solar resources.
- Public Service may need to acquire additional small-scale resources for compliance with the distributed generation requirements of the RES.



RENEWABLE ENERGY STANDARD

WHAT IS THE MIX OF GENERATION SOURCES IN USE BY PUBLIC SERVICE?



HOW IS BLACK HILLS DOING IN ACHIEVING THE REC GOALS?

- In 2011, Black Hills caused to be generated 218,532 RECs
- The goal for 2011 was 12% of sales from renewable energy, which was about 219,000 RECS. Black Hills acquired excess RECs in previous years and used a portion of those banked RECs for 2011 compliance. They banked the RECs acquired in 2011 for compliance in future years.
- Lacking economies of scale for wind purchases and with a smaller market to attract PV installers, Black Hills faces more challenges in complying with RES requirements.
 - Black Hills recently reported to the Commission that without the acquisition of additional renewable resources, to remain under the 2% cap on the retail rate impact, it will only be able to provide 7% of its total energy from eligible energy resources starting in 2016.



RENEWABLE ENERGY STANDARD

ISSUES/CHALLENGES ASSOCIATED WITH RES COMPLIANCE

- Unlike fossil-fuel resources that can be dispatched to meet demand, wind and solar resources installed to date are variable generators that require sophisticated forecasting systems and the availability of other flexible generators for successful integration with the utility system.
 - Public Service is managing a significant amount of wind on its system and faces operational challenges when wind generation ramps up or down quickly.
- The retail rate impact of the RES depends on how expensive renewable resources are compared to conventional gas-fired generation.
 - When natural gas costs are low and when there is no price on carbon emissions, the relative cost of renewables is greater.
 - Under these conditions, the RESA surcharge at 2% may not be enough to fund the acquisition of more eligible energy resources, since the collections will be needed to cover the incremental costs of renewables already acquired.
 - In addition, both IOUs loaned funds to the RESA in past years and will have to use future RESA collections to bring the RESA back into balance.