Northwest **Power** and **Conservation** Council

September 6, 2017

MEMORANDUM

TO: **Council Members**

FROM: **Tina Jayaweera and Elizabeth Osborne**

SUBJECT: **Avista's 2017 Integrated Resource Plan and Smart City Demonstration Project**

BACKGROUND:

Presenter: James Gall, Senior Power Supply Analyst, Avista
Heather Rosentrater, Vice President, Energy Delivery, Avista

Summary: Avista will present on its recently released Integrated Resource Plan as well as its "Urbanova Smart Cities" project.

James Gall will summarize Avista's Integrated Resource Plan, released August 31, 2017. This plan shows how Avista might meet resource needs over the planning horizon with a mix of energy efficiency, demand response, renewables, and a combination of other resources that are dispatchable and fulfill annual/seasonal capacity needs.

Heather Rosentrater will provide an overview of Avista's role in the Urbanova Smart Cities project. Urbanova is a "living laboratory," located in the university district in downtown Spokane, Washington, that builds upon existing utility infrastructure to provide research opportunities and testing grounds for new technologies. Heather will review the partner organizations in the Urbanova effort, and the projects and technologies that are in place or planned for near-term installation.

Background: James Gall is the Integrated Resource Planning Manager at Avista. James has been with Avista since 2004 starting as a Power Supply Analyst. In his current role, James is responsible for the Company's power supply analyses; including Integrated Resource Planning (IRP), Requests for Proposals (RFP) analysis, power supply costs calculations in rate proceedings, and market & resource analyses. Prior to coming to Avista, James was an analyst for PacifiCorp. James' educational background is a MBA from Gonzaga University and a BA in Business Administration-Finance from Western Washington University.

Heather Rosentrater is vice president of energy delivery at Avista Corp., where she's responsible for electric and natural gas engineering, operations and shared services such as fleet, facilities and supply chain. Heather has led Avista's Grid Innovation, Smart Grid and Smart City efforts. She also has broad experience on both the electric and natural gas sides of Avista Utilities, having managed departments and projects in transmission, distribution and SCADA, as well as asset management.

More Info: Link to Avista's IRP and Urbanova Smart Cities

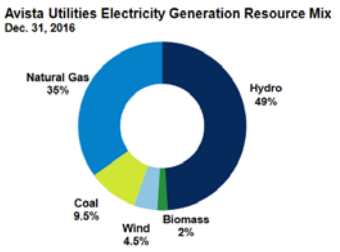
2017 Electric Integrated Resource Plan

Released August 31, 2017

James Gall
Integrated Resource Planning Manager

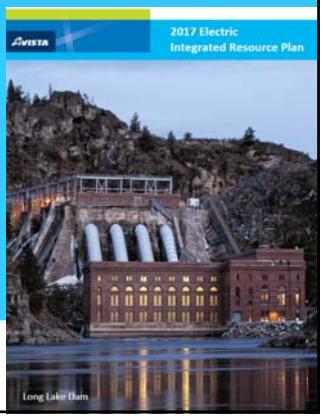
About Avista

- 30,000 square mile service territory
- 1.6 million area population
- 377,000 electric customers
- 340,000 natural gas customers



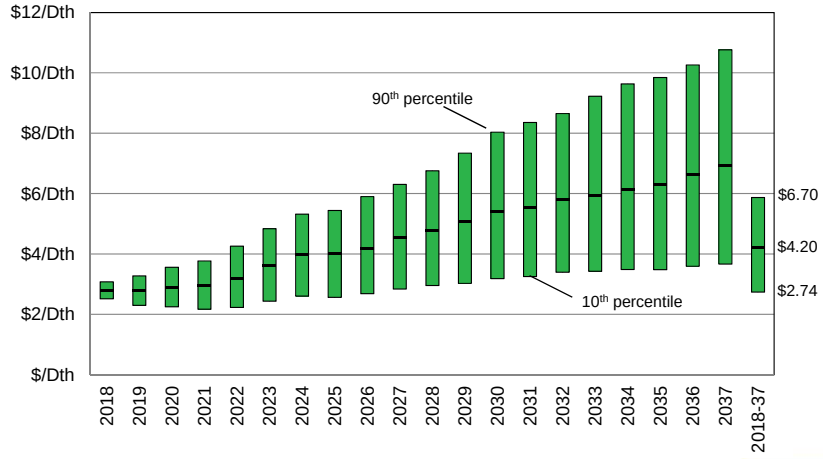
Does not include AEL&P

Market Forecast



Natural Gas Price Forecast

$4.20 per Dth nominal levelized price between 2018 and 2037 at Stanfield



2017$ Real Levelized Price is $3.50/Dth

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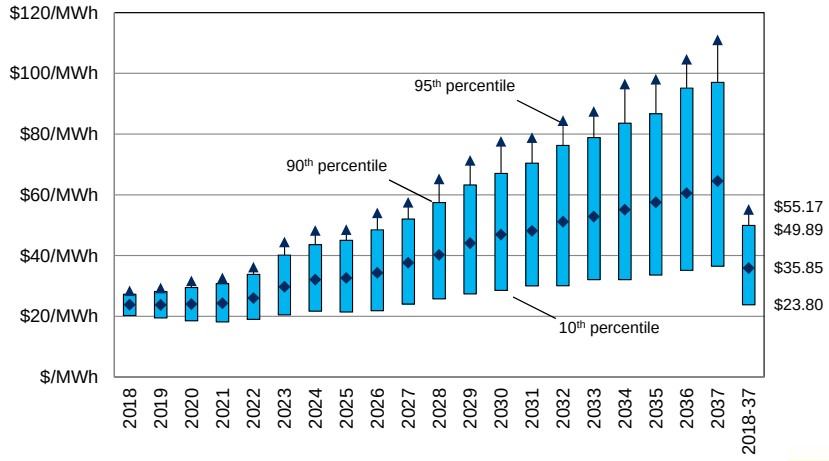
Mid-Columbia Electric Price Forecast

$35.85 per MWh Nominal Levelized Flat Price at Mid-Columbia



2017$ Real Levelized Price is $29.90/ MWh

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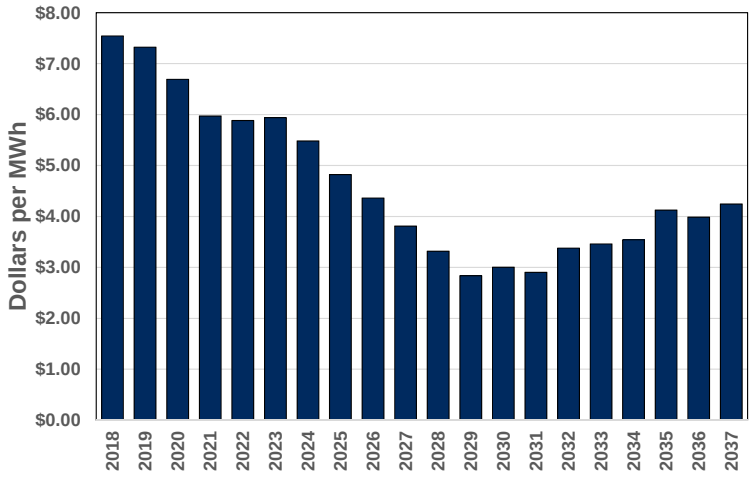
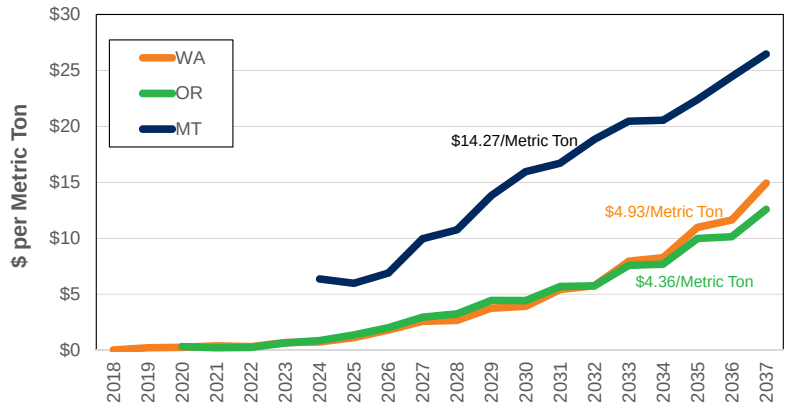
Mid-Columbia On/Off Peak Spread

Spreads reduce up to 60 percent over the forecast



Greenhouse Gas Price Forecast

Prices are a result from a cap and trade market for each state



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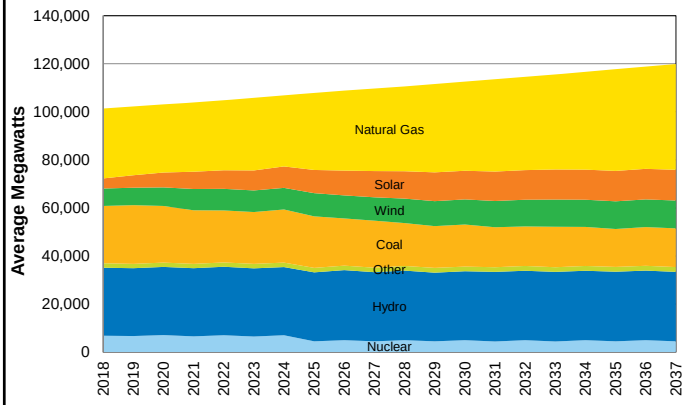
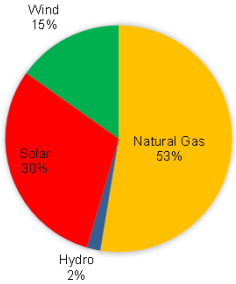
Western Interconnect Energy Mix

Renewables and natural gas replace retired coal and load growth



New Resources Serving Load Growth & Expired Coal Resources



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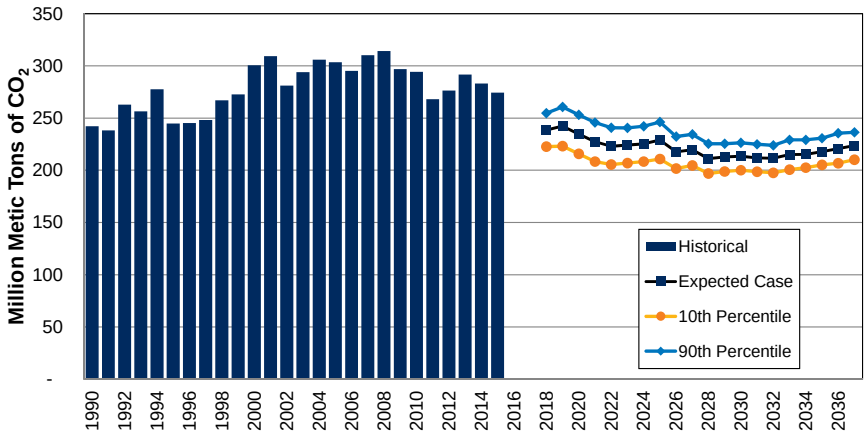
Greenhouse Gas Emissions

Western emissions are 8 percent below 1990 levels & 26 percent below 2005 levels by 2037



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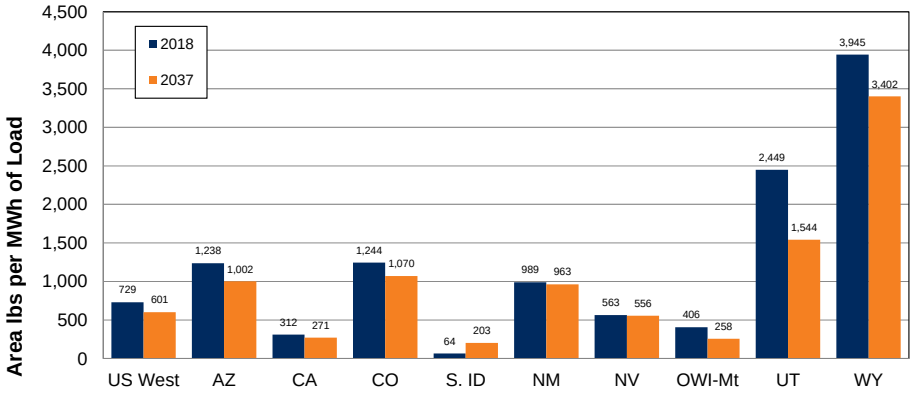
Greenhouse Gas Emissions Intensity

Western emissions intensity falls 18 percent over the study



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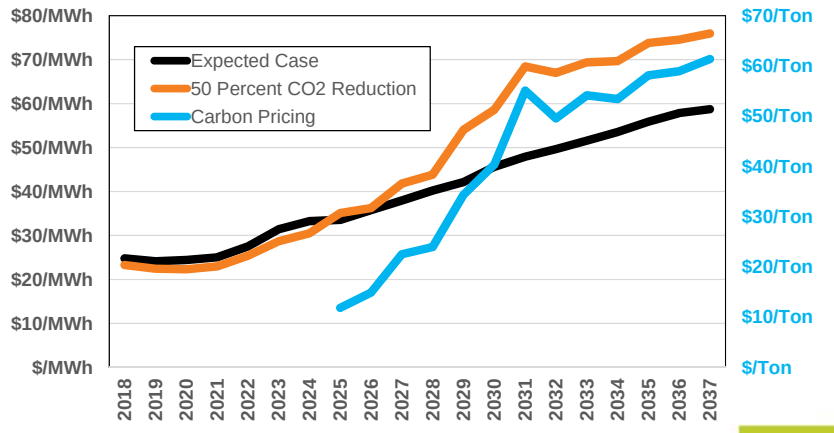
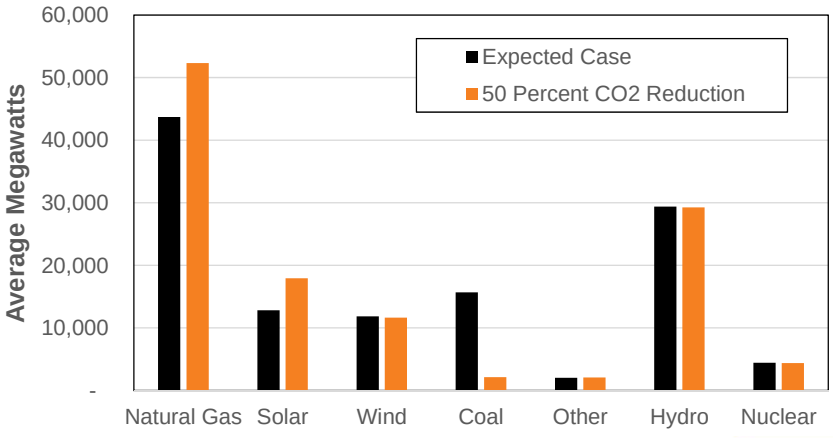
Market Scenario: 50 Percent Greenhouse Gas Reduction from 1990 Levels

$60 per metric ton carbon price is required to reduce emissions

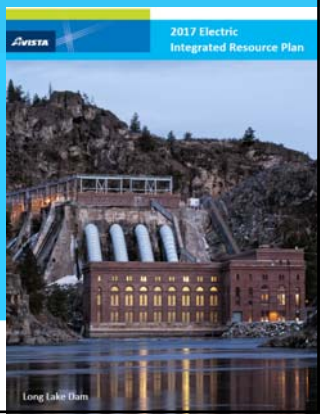


Market Scenario: 50 Percent Greenhouse Gas Reduction from 1990 Levels

Coal is phased out and replaced with natural gas and solar

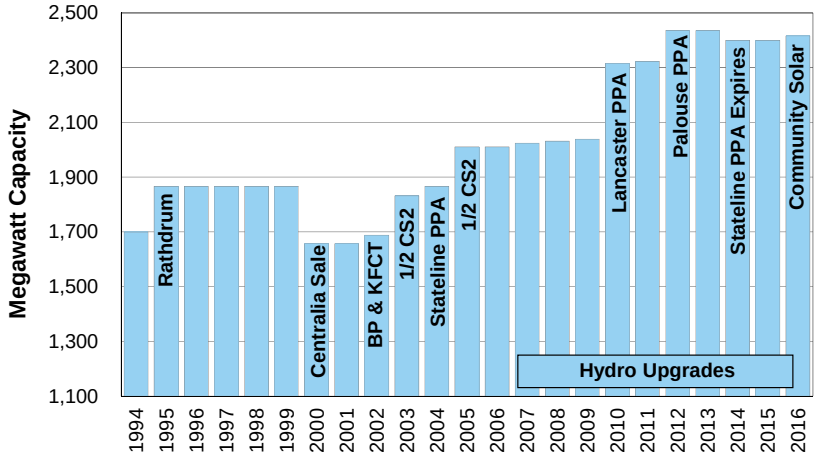


Avista's Portfolio



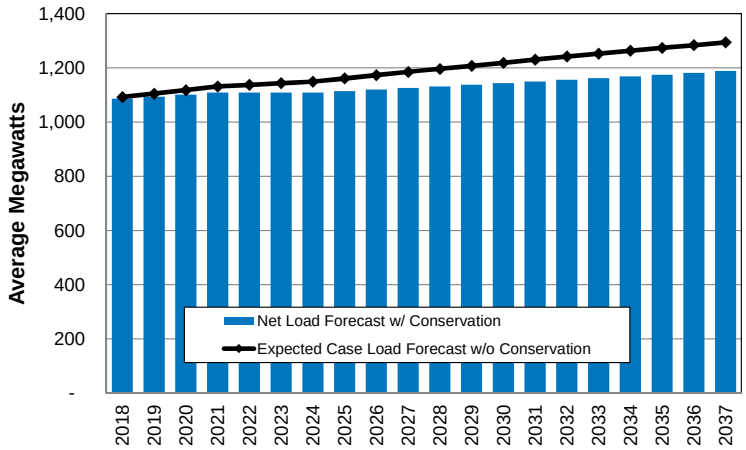
Avista's Historical Resource Acquisitions

Since 2011, all Avista's resource acquisitions have been renewable



Load Forecast

Loads grow at 0.9%, energy efficiency serves 53.3% of growth or a net growth of 0.47%



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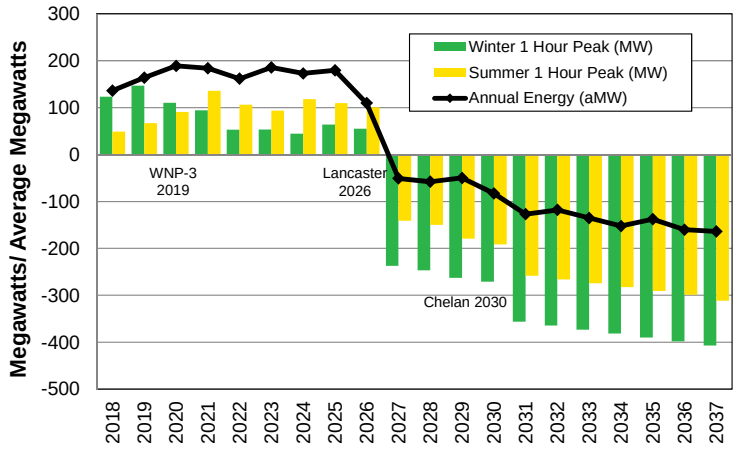
Resource Needs

w/ Chelan contract extension; no capacity requirements until 2026 when the Lancaster PPA Expires



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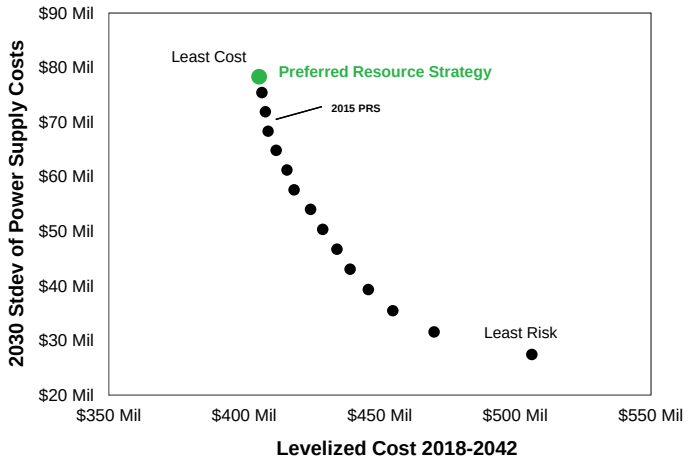
Efficient Frontier

Least Cost Strategy Selected as PRS



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Preferred Resource Strategy

The 2011 IRP included 996 MW of new generation resources

Resource	By the End of Year	Nameplate (MW)	Winter Peak (MW)	Energy (aMW)
Solar	2018	15	0	3
Natural Gas Peaker	2026	192	204	178
Thermal Upgrades	2026-2029	34	34	31
Storage	2029	5	5	0
Natural Gas Peaker	2030	96	102	89
Natural Gas Peaker	2034	47	47	43
Total		**389**	**392**	**344**
Efficiency Improvements	**Acquisition Range**		**Winter Peak Reduction**	**Energy (aMW)**
Energy Efficiency	2018-2037		203	108
Demand Response	2025-2037		44	0
Distribution Efficiencies			<1	<1
Total			**247**	**108**

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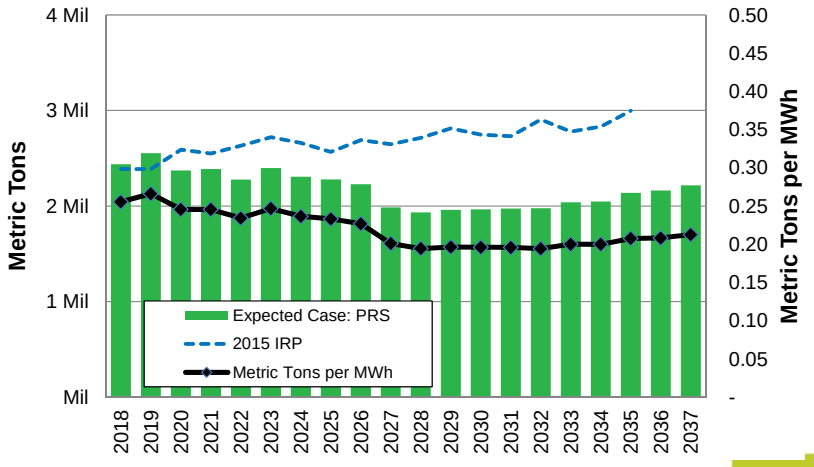
PRS: Direct Greenhouse Gas Emissions

Emissions fall by 11% from 2018/19 avg, 29% below 2015 IRP PRS



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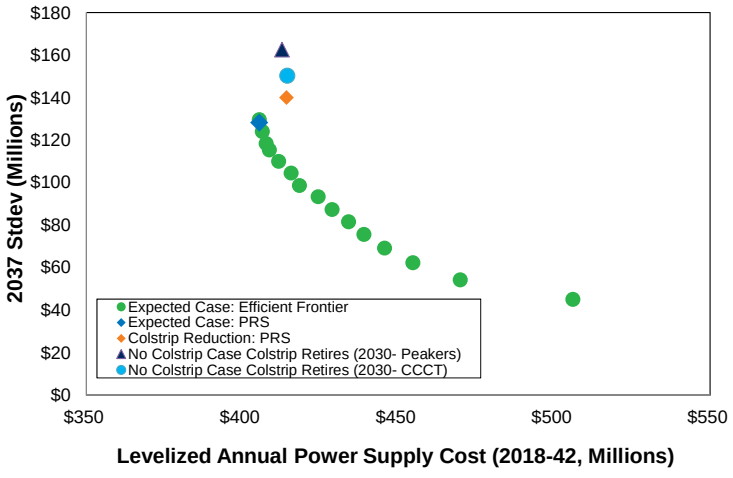
Colstrip Retires Scenarios

First year without Colstrip, cost increases by $50 million, at a rate of $38 to $48 per metric ton



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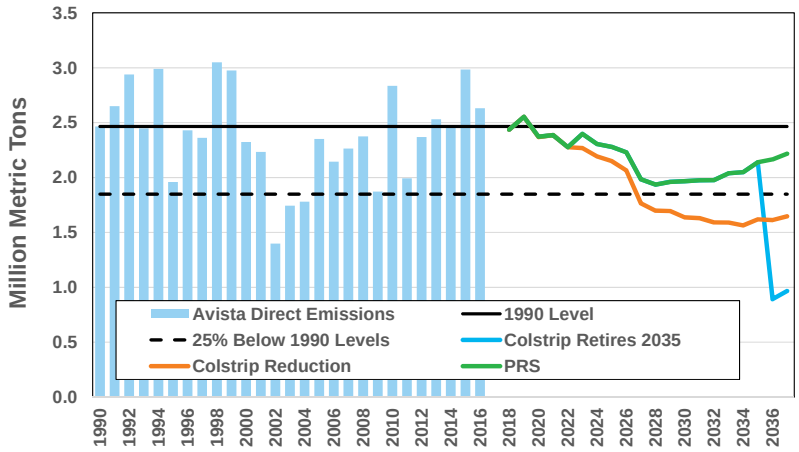
Direct Greenhouse Gas Emissions

Washington State emission goals are in reach



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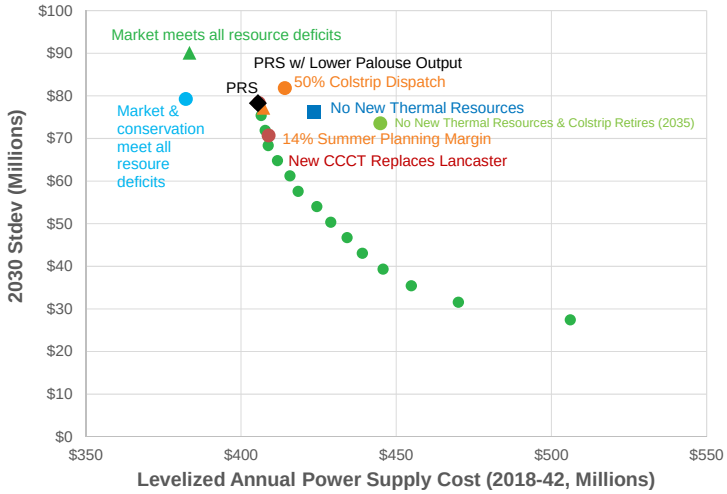
Portfolio Scenarios

Alternative resource strategies add cost, but may lower risk



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