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# Washington State 2021 Energy Strategy

## Electricity Sector Framing Document

### Introduction

The Washington Department of Commerce is developing the 2021 State Energy Strategy (SES) to support the state's ambitious goals to protect our climate while **ensuring an equitable transition to clean energy** and promoting the state's workforce and economy.

The development of the SES includes a sector-specific Technical Advisory Process (TAP) to evaluate policies and actions with both quantitative and qualitative analysis. The outcome will feed into a set of Advisory Committee recommendations to the Department of Commerce and, ultimately, a final report to the Governor and legislators. Please see the accompanying document for a full description of the description of WA State Energy Strategy TAP.

This document provides an overview of the key questions and issues facing the electricity sector; goals to guide the strategy development; a snapshot of the current situation and key trends; an initial list of potential policies and actions to be considered for the strategy; the policy context; and a starter list of topics for further research and discussion.

### 1. Electricity Sector Focus and Framing Questions

The focus for the **Electricity Sector TAP** will be on developing policies and actions to enable the transition to 100% renewable and non-emitting electricity while meeting economy-wide electrification targets via a mix of resources, including solar, wind, hydropower, hydrogen, biofuels, and demand-side management; determining the role of gas as part of the supply mix; addressing reliability and affordability; grid modernization and integration; and transmission.

The Clean Energy Transformation Act (CETA) sets targets for carbon-neutral electricity by 2030, and 100% carbon-free electricity by 2045, and drives the key issues and critical questions that the electricity sector must address in the coming decade. A key overarching question is:

- With efficiency and electrification as top priorities to achieve decarbonization, what policies, investments, and other actions are needed in the coming decade to meet CETA mandates and be on track to meet the state's 2050 climate targets?

In addition, key issues to address in the SES are:

1. **Markets:** How to establish a market framework that facilitates and accelerates the transition in the electricity sector, enabling the efficient use of existing resources and providing price signals for new resources and solutions to address capacity, reliability, and non-wire alternatives?
2. **Equity:** How to meet the legislative mandate (RCW 19.405.040(8)) to ensure equitable distribution of energy and non-energy benefits and the legislative finding (RCW 19.405.010) that the public interest includes the equitable distribution of energy benefits and reduction of burdens to vulnerable populations and highly impacted communities and builds on the comprehensive equity work now underway at the Utilities and Transportation Commission (UTC) and the Department of Commerce?
  - How to ensure energy sufficiency for all energy users tailored to need?
  - How to provide affordable clean electricity and electricity services (including electrification) to the full spectrum of utility customers, meeting the needs of low-income and marginalized communities (including addressing cost relative to ability to pay), consistent with CETA's equitable distribution requirements?
3. **Generation Resources:** What new generation (energy and capacity) resources will be needed to meet expected demand in a low-carbon future, taking into account expected impacts of efficiency gains and increased demand associated with electrification?<sup>1</sup> What barriers and constraints might limit achieving these levels and types of low-carbon resource builds and acquisitions? How can they be overcome? What are the potential roles of distributed vs. centralized resources, and new technologies, including micro-grids and district energy systems? How can existing resources and infrastructure be used more efficiently to contribute to achieving GHG reductions?
4. **Electrification:** How to accelerate electrification and address energy and capacity issues associated with electrification? What role can/must utilities play? What changes are needed in utility rate structures and/or operating practices, investments, etc.?
5. **Demand Management and Storage:** What barriers and constraints might limit adoption of demand management and storage options and how might they be overcome? What incentives would encourage adoption of demand management to increase grid reliability and resource adequacy? How might advances and aggressive demand management change expectations of demand?
6. **Reliability and Resource Adequacy:** How to maintain grid reliability and resource adequacy in this transition? In the near term, how to deal with the impending retirement of coal resources? In the longer term, how to adapt to a likely ever-increasing reliance on intermittent renewable and distributed energy resources?<sup>2</sup> How might our definitions and expectations of reliability and adequacy shift to balance all outcomes and align with new sources of generation?

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<sup>1</sup> Estimates of new generation requirements will be based on results of the DDP modeling conducted for the State Energy Strategy technical process, as well as review of existing studies and projections.

<sup>2</sup> The DDP modeling will provide an estimate of resources needed to meet resource adequacy and reliability requirements. The results of other existing studies done by organizations, including the NW Power Pool, will also be considered in formulating recommendations to ensure resource adequacy and reliability.

7. **Grid Modernization and Resilience:** How to modernize the transmission and distribution systems to increasingly: 1) integrate renewables; 2) enable demand response, management, and other distributed energy resources; 3) cost-effectively and efficiently electrify the transportation and building sectors; and 4) maximize grid efficiency and resilience? What strategies should the state adopt to direct or support accelerated grid modernization consistent with meeting CETA targets?
8. **Regional Grid Integration:** How to better/fully integrate the regional western grid, including potentially adding new transmission capacity and market mechanisms to maximize the value and benefit of diverse resources (e.g., solar in CA and other Southwest states and wind in MT, ID and WY), thereby minimizing the total cost of the transition?
9. **Siting and permitting:** How to best facilitate the siting and permitting of any required new generation and transmission facilities in a socially and environmentally responsible and just manner? What distributive issues need to be addressed in resource siting and permitting?
10. **New Technologies:** How to lay the groundwork for the future development and deployment of new technologies, potentially including, but not limited to, renewable gas, liquid fuels produced from hydrogen, and carbon capture to meet energy demand and maximize capacity factors in the electricity sector?

## 2. Electricity Sector Clean Energy Goals

CETA establishes milestones for the electricity sector on the way to achieving a 100% clean electricity supply by 2045. Milestones must be met by all electric utilities serving retail customers in Washington State. The first milestone is 2025, when coal generation must be eliminated from utility portfolios in the state. In 2030, electricity must be 100% carbon-neutral, with offsets allowed up to 20% of utility portfolios. By 2045, utilities must supply 100% carbon-free electricity, with offsets no longer allowed as a compliance alternative.

**Table 1. CETA Milestones**

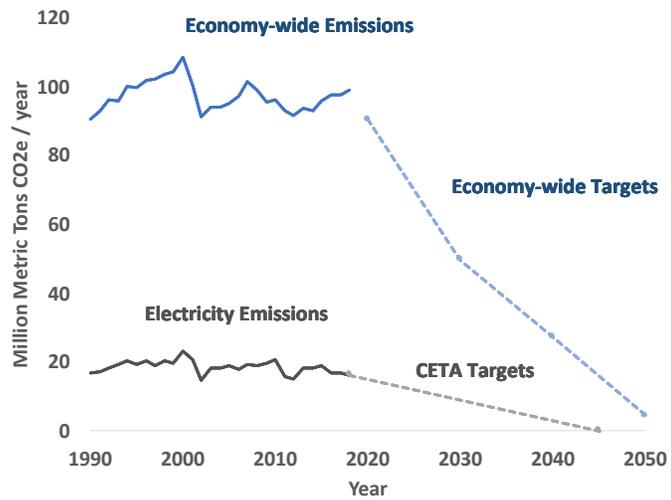
Year	Milestones
2025	Eliminate coal generation from state portfolios
2030	100% carbon-neutral electricity (offsets <sup>[a]</sup> allowed to cover 20%)
2045	100% carbon-free electricity (no offsets)

[a] offsetting actions include unbundled renewable energy credits, energy transformation projects, alternative compliance payments, and potentially electricity generated at the Spokane municipal solid waste incinerator.  
Source: RCW 19.405.

### **CETA Impact**

By eliminating coal resources in the state electricity supply by 2025, CETA will mitigate the main source of GHG emissions in the sector over the next decade. In addition to eliminating the existing GHG emissions from the electricity sector, any growth in electricity demand resulting from the electrification of other sectors, such as transportation and buildings, will increasingly be met by carbon-free sources rather than new or existing fossil fuel resources.

**Figure 1. WA Historical GHG Emissions and Reduction Targets**



*Source: Solid lines are based on data from Washington State Department of Ecology, 2018 Greenhouse Gas Emissions Inventory; Dashed lines are based on electricity sector and state targets promulgated by RCW 19.405.010 and RCW 70.235.020. Elimination of coal from utility portfolios by 2025 will result in a substantial decrease in GHG emissions, but the exact reduction will depend on the future resource mix.*

### **3. Current Situation and Key Trends**

The electricity sector is in a dynamic state of change due to multiple factors, including: the adoption of CETA; the ongoing impact of demand-side efficiency resulting in minimal load growth; the expansion of wind and solar capacity; increased customer demand for carbon-free energy; the impending closure of regional coal plants; historically low natural gas prices; and policies and renewables investments in California and elsewhere affecting the situation in Washington State.

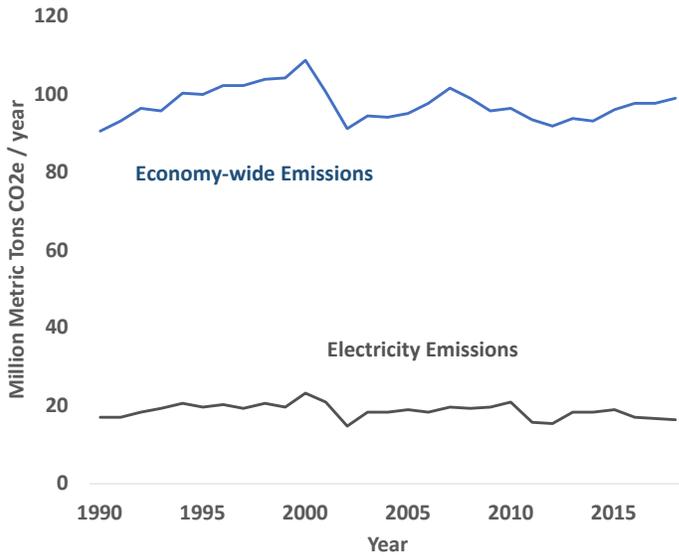
At the same time, other characteristics of Washington’s electricity sector have remained constant, including the relatively high percentage of carbon-free energy and the relatively low electricity prices due to the federal hydropower system. This section provides a snapshot of some of the key technical, market, and transition issues and trends relevant to developing the electricity sector portion of the SES.

#### **Steady Emissions, Driven by Coal**

GHG emissions in Washington State’s electricity sector held relatively steady over the past few decades. But in recent years, economy-wide emissions increased while electricity sector emissions trended downward as the renewable energy portfolio standard established through the 2006 Energy Independence Act required increasingly more renewable resources.

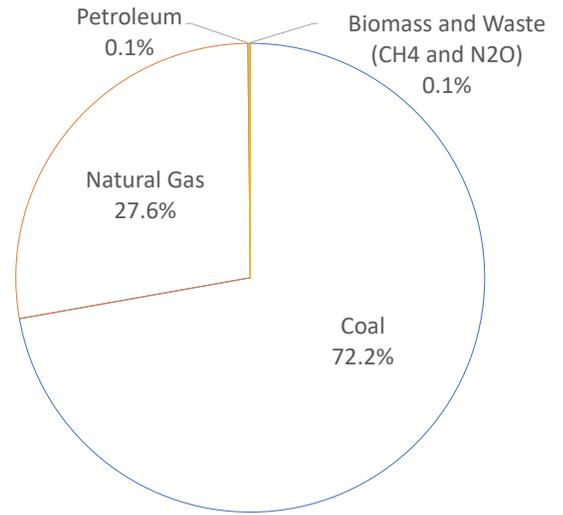
In 2018, electricity consumption in Washington resulted in 19 million metric tons of GHG emissions, about 16% of economy-wide emissions, with just under three quarters of current electricity sector GHG emissions due to coal generation.

**Figure 2. WA Historical GHG Emissions**



Source: Data from Washington State Department of Ecology, 2018 Greenhouse Gas Emissions Inventory.

**Figure 3. 2018 WA Electricity Sector GHG Emissions, by Fuel**



Source: Data from Washington State Department of Ecology, 2018 Greenhouse Gas Emissions Inventory.<sup>3</sup>

**Publicly-Owned Utilities with Hydropower Resources Provide Existing Base of Carbon-free Power**

The electric utility sector in Washington serves over 3 million customers, sells about 90 million megawatt-hours of electricity, and generates over \$7 billion in revenue annually.<sup>4</sup> The three investor owned utilities in the state account for nearly half of customers and a third of sales. Washington also relies on public power—municipal utilities, public utility districts, and rural cooperatives—much more than most other states. Table 2 and Figure 4 provide more detail on these market share statistics. Table 2 presents the number of utilities and MWh sales of electricity by ownership type. Figure 4 shows the percentage of electricity sales by ownership type.

**Table 2. Washington Electric Utilities**

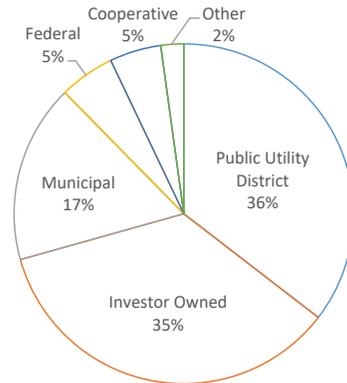
Ownership	Count	2018 Sales (MWh)
Public Utility District	24	32,786,361
Investor Owned	3	32,585,924
Municipal	13	15,714,774
Federal	2	4,875,244
Cooperative	17	4,533,372
Other	10	2,019,612

Source: Data from Washington State Department of Commerce, 2018 WA State Fuel Mix Disclosure.

<sup>3</sup> Future versions of this chart will include most recent data available and utility fuel mix data as appropriate.

<sup>4</sup> 2018 EIA data (<https://www.eia.gov/electricity/data.php>)

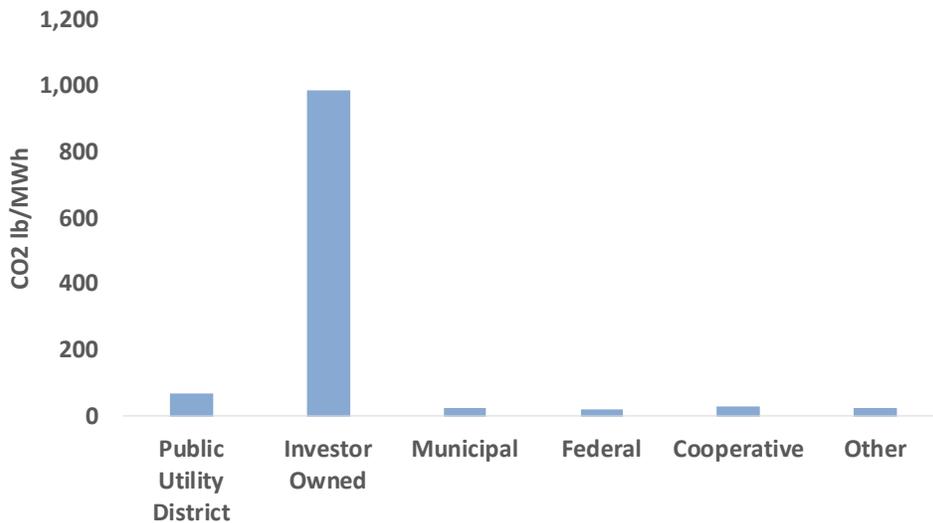
**Figure 4. Percentage of Annual Sales (MWh) in Washington, by Utility Ownership**



Source: Data from Washington State Department of Commerce, 2018 WA State Fuel Mix Disclosure.

The carbon intensity of electricity in Washington is one of the lowest in the country, a consequence of extensive hydropower resources. For most utilities in the state, carbon-free electricity already makes up a substantial portion of supply. In contrast, electricity sold by investor owned utilities (IOUs) has substantially higher carbon intensity, as shown in Figure 5. IOUs account for 88% of coal-generated electricity sold in the state and a large portion of the sector’s overall emissions.<sup>5</sup>

**Figure 5. Average Carbon Intensity of Electricity in Washington, by Utility Ownership**



Source: Data from Washington State Department of Commerce, 2018 WA State Fuel Mix Disclosure.

**Utilities Expand Carbon-free Supply under Renewable Portfolio Standard**

The Energy Independence Act (I-937) mandated that all electric utilities serving at least 25,000 customers procure 15% of their electricity from qualified renewable sources by 2020. I-937 covered 17

<sup>5</sup> Washington State Department of Commerce, 2018 WA State Fuel Mix Disclosure.

utilities that together account for 80% of the electricity sold in Washington.<sup>6</sup> In 2020, all but three of these utilities have reported compliance through direct generation or procurement of renewables, or by purchasing renewable energy credits (RECs). The remaining utilities are complying through cost cap provisions.

**Figure 6. Renewable Portfolio Compliance among Qualifying Washington Utilities<sup>7</sup>**

Utility	Average Load 2018-2019 (MWh)	15% Renewable Target for 2020 (MWh)	Qualifying Renewables for 2020 (MWh)	Qualifying Renewables for 2020 (% of load)	Incremental Cost of Renewable Energy and RECs (% of revenue requirement)
Avista	5,640,469	846,070	846,070	15.0%	-0.6%
Benton PUD	1,753,510	263,027	263,027	15.0%	3.1%
Chelan PUD	1,698,853	254,828	254,828	15.0%	0.0%
Clallam PUD	635,423	95,313	95,315	15.0%	1.8%
Clark Public Utilities	4,489,605	673,441	205,795	4.6%	4.0%
Cowlitz PUD	4,768,870	715,330	715,332	15.0%	1.7%
Grant PUD	5,034,072	755,111	755,186	15.0%	4.1%
Grays Harbor PUD	950,900	142,635	143,377	15.1%	5.4%
Inland Power	897,260	134,589	134,589	15.0%	1.9%
Lewis PUD	931,215	139,682	139,682	15.0%	3.0%
Mason PUD #3	650,081	97,512	97,512	15.0%	2.5%
Pacific Power	4,046,853	607,028	607,028	15.0%	1.5%
Peninsula Light	583,953	87,593	87,593	15.0%	0.6%
Puget Sound Energy	20,765,213	3,114,782	3,114,782	15.0%	1.4%
Seattle City Light	9,078,427	1,361,764	534,058	5.9%	0.7%
Snohomish PUD	6,509,307	976,396	976,396	15.0%	5.2%
Tacoma Power	4,644,322	696,648	654,764	14.1%	1.0%
<b>Total</b>	<b>73,078,330</b>	<b>10,961,749</b>	<b>9,625,334</b>	<b>13.2%</b>	<b>1.9%</b>

Note:  
Clark Public Utilities intends to comply under the 4% cost cap provision.  
Seattle City Light and Tacoma Power intend to comply under the 1% no-growth cost cap provision.

Source: Washington State Department of Commerce, 2020 EIA Utility Reports. <https://www.commerce.wa.gov/wp-content/uploads/2020/06/Energy-EIA-2020-Report-Summary-and-Detail.pdf>.

### Wind Leads Growth in Renewables Capacity

Hydropower has long been the dominant source of carbon-free power in Washington and that remains the case. However, hydropower capacity is no longer the source of renewables growth in the state. As shown in Table 3, installed capacity of non-hydro renewables has doubled in Washington over the last decade. New wind resources are largely responsible for this growth, increasing from just under 1,500 MW in 2008 to over 3,000 MW in 2018. The state's largest solar plant was installed in 2018, adding 19.2

<sup>6</sup> Washington State Department of Commerce, Energy Independence Act. <https://www.commerce.wa.gov/growing-the-economy/energy/energy-independence-act/>; Note: Franklin PUD becomes subject to the EIA's conservation requirements in 2020 and its renewable requirements in 2022.

<sup>7</sup> Washington State Department of Commerce, 2020 EIA Utility Reports. <https://www.commerce.wa.gov/wp-content/uploads/2020/06/Energy-EIA-2020-Report-Summary-and-Detail.pdf>.

MW-AC to the grid. Nonetheless, distributed solar PV continues to exceed utility-scale solar resources in the state, as Table 3 shows.

**Table 3. Cumulative Renewable Electricity Installed Capacity (MW-AC) in Washington**

Year	Wind	Utility-Scale Solar PV	Distributed Solar PV	Biomass Energy	Hydro	Total Renewables	Total Non-Hydro Renewables
2008	1,447	1	3	350	20,807	22,608	1,801
2009	1,980	1	4	-	20,807	22,792	1,985
2010	2,104	1	7	437	20,815	23,364	2,549
2011	2,573	1	12	431	20,954	23,970	3,016
2012	2,808	1	19	403	21,112	24,342	3,230
2013	2,808	1	27	423	20,957	24,215	3,258
2014	3,075	1	39	422	20,977	24,513	3,536
2015	3,075	1	64	406	20,995	24,540	3,545
2016	3,075	1	69	471	21,106	24,721	3,615
2017	3,075	1	97	474	21,139	24,785	3,646
2018	3,076	20	128	402	21,273	24,899	3,626

Source: National Renewable Energy Laboratory (<https://www.nrel.gov/analysis/energy-data-books.html>); 1990-2018 EIA data (<https://www.eia.gov/electricity/data/state/>).

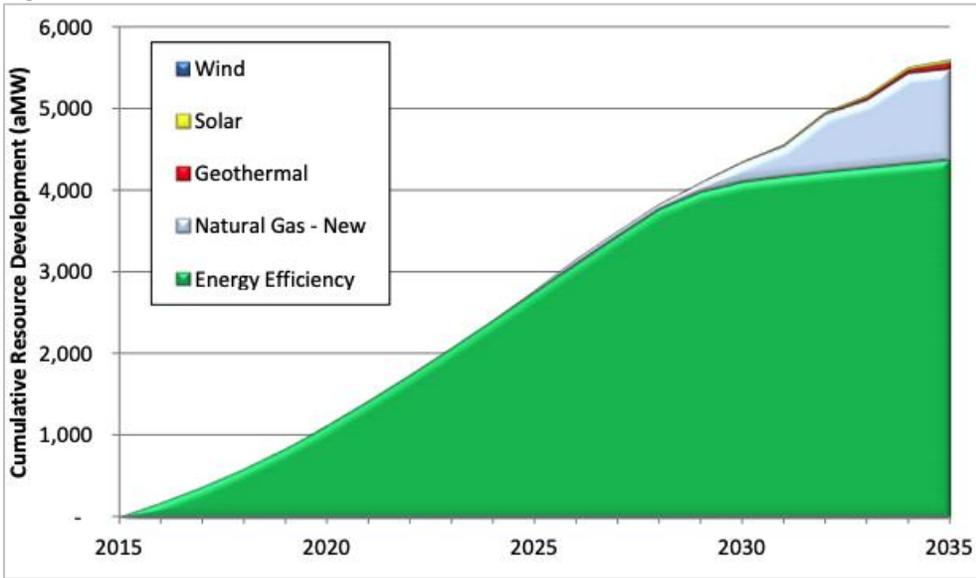
### ***Energy Efficiency Plays a Key Role in Meeting Capacity Needs***

Energy efficiency investment has long been a key part of the regional strategy for maintaining resource adequacy in the Pacific Northwest. In its most recent regional power plan released in 2016, the Seventh Power Plan, the Northwest Power and Conservation Council (NWPPCC) identified energy efficiency investments as the primary strategy for meeting future resource needs (see Figure 7).<sup>8</sup> Energy efficiency was shown to be the least costly and least risky resource, and likely capable of meeting all increased load through 2030.

In the two years following the release of the Seventh Power Plan, \$981 million was invested in energy efficiency upgrades through regional utility programs. These investments have led to regional savings of over 400 MW.

<sup>8</sup> Northwest Power and Conservation Council, 7<sup>th</sup> Northwest Conservation and Electric Power Plan, Chapter 1: Executive Summary. [https://www.nwcouncil.org/sites/default/files/7thplanfinal\\_chap01\\_execsummary\\_6.pdf](https://www.nwcouncil.org/sites/default/files/7thplanfinal_chap01_execsummary_6.pdf).

**Figure 7. Seventh Power Plan Resource Portfolio**



Source: Northwest Power and Conservation Council, 7<sup>th</sup> Northwest Conservation and Electric Power Plan, Chapter 1: Executive Summary. [https://www.nwcouncil.org/sites/default/files/7thplanfinal\\_chap01\\_execsummary\\_6.pdf](https://www.nwcouncil.org/sites/default/files/7thplanfinal_chap01_execsummary_6.pdf).

As shown in Figure 8, preliminary projections from the NWPC’s 2021 Northwest Power Plan demonstrate a substantial continued role for energy efficiency in meeting the region’s future energy needs.

**Figure 8. Preliminary Projection of the Role of Energy Efficiency for Northwest Power Grid**

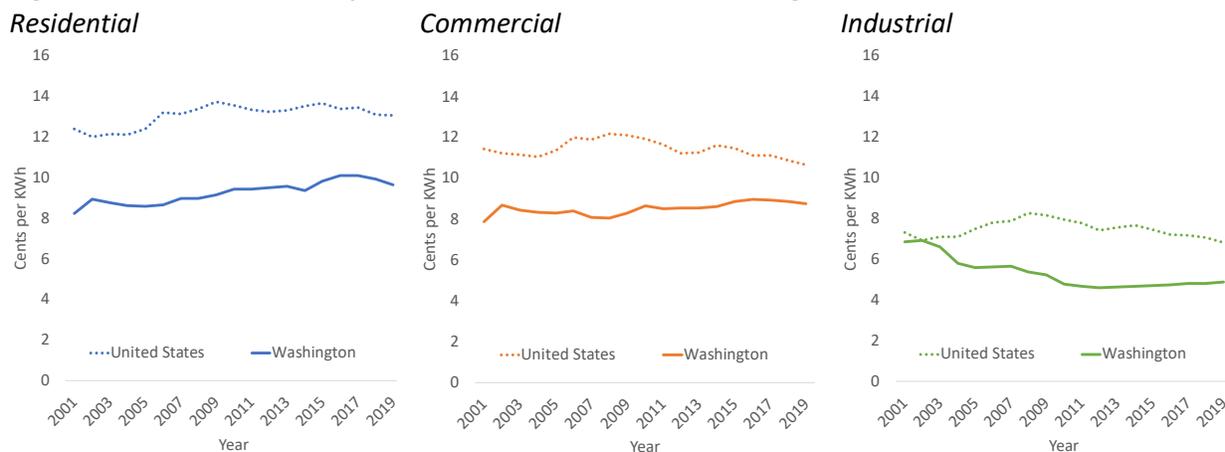
Sector	20-Year Achievable Potential (aMW) (all cost bins)		Winter Peak MW	Summer Peak MW
	7th Plan	2021 Plan PRELIMINARY	2021 Plan PRELIMINARY	2021 Plan PRELIMINARY
Residential	2,328	2,444		
Commercial	1,871	1,255		
Industrial	580	871		
Utility	218	232		
Agriculture	126	70		
<b>Grand Total</b>	<b>5,123</b>	<b>4,872</b>	<b>8,230</b>	<b>9,290</b>

Source: Northwest Power and Conservation Council. EE supply curves for Draft Plan (02/2020). [https://www.nwcouncil.org/sites/default/files/2020\\_03\\_p2.pdf](https://www.nwcouncil.org/sites/default/files/2020_03_p2.pdf).

**Electricity Prices in Washington Consistently Remain Below the National Average**

Retail electricity prices across the residential, commercial, and industrial sectors in Washington State have long remained below national averages. While prices for residential customers have increased slightly in the last two decades in line with national trends, commercial rates in the state have stayed fairly level, and industrial rates have declined substantially, as Figure 9 demonstrates.

**Figure 9. Historical Electricity Prices in United States and Washington State (2019 dollars)**



Source: Data from U.S. Energy Information Administration.

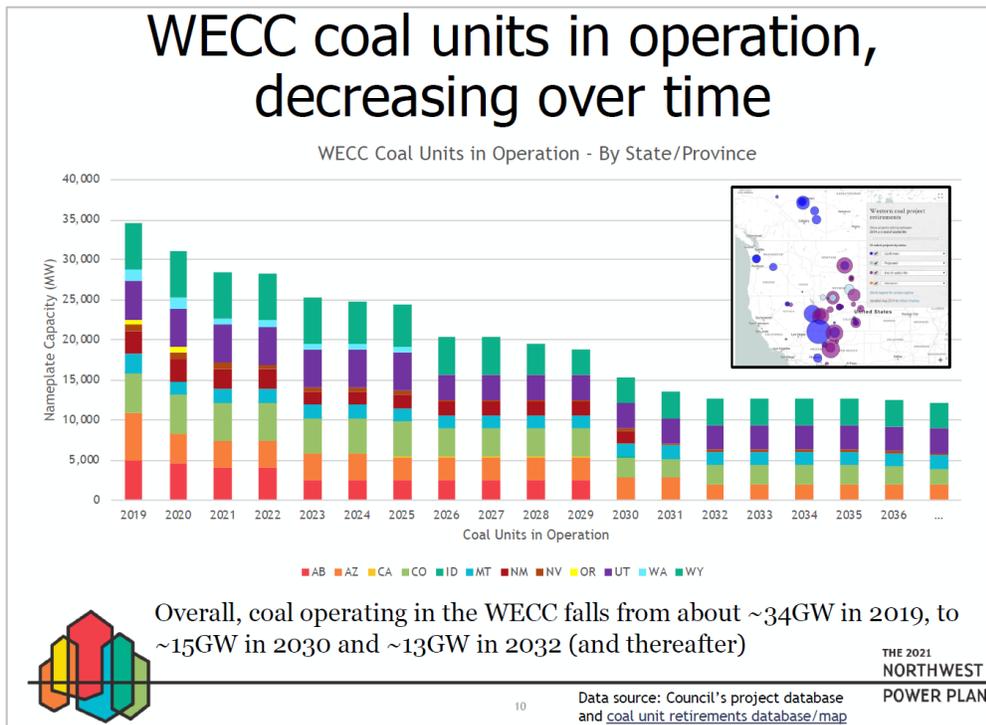
**Future Grid Reliability and Resource Adequacy Issues Emerge as a Concern**

With planned retirements of coal-fired power plants in the Western region and increasing variability in available supply due to the growth of intermittent renewable resources, the region faces a potential capacity shortfall during times of high demand and low supply.

Grid reliability challenges in the future will be different than in the past, as they will be caused not just by peak demand but also by limited supply. Specifically, regional planners are concerned about times when demand for electricity is high due to very hot or very cold temperatures while hydro, wind, and solar power availability are all low. Given the dynamics of the hydropower system, these types of events could last for days and even a couple of weeks rather than occurring in one day. Providing adequate capacity and ensuring against grid failure will be a challenge going forward.

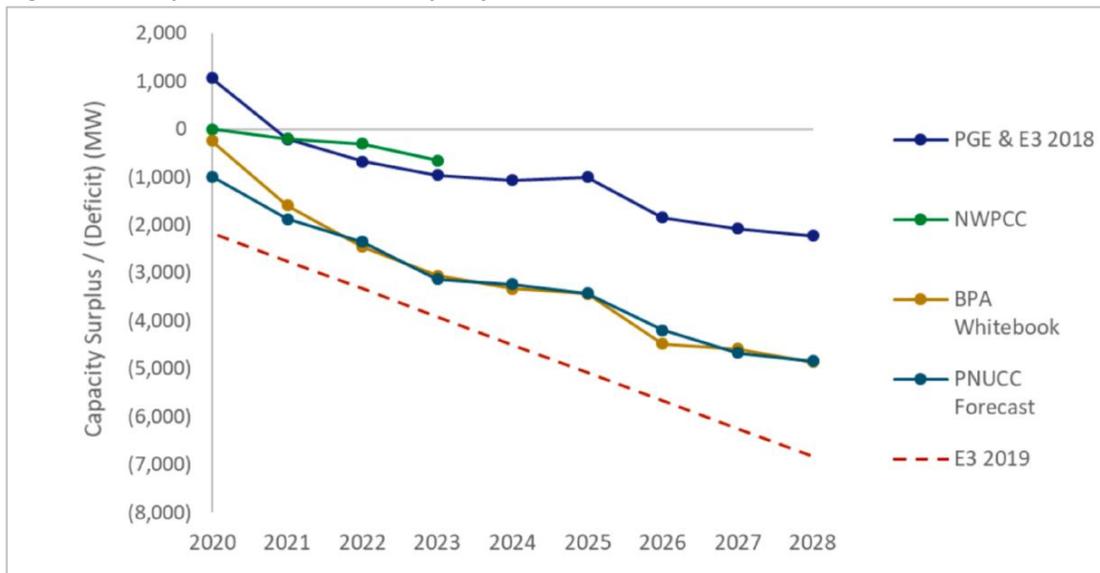
The charts below tell this story. Figure 10 shows planned retirements of coal-fired units in the Western grid, resulting in a decline of coal resources from 34 to 15GW. Figure 11 summarizes the projected regional capacity surplus/deficit from different studies as compiled by E3. All forecasts project a deficit in the coming decade in the absence of new resources, storage, regional grid integration, and/or demand reductions.

**Figure 10. Planned Retirements of Coal Fired Power Plants in the Western Grid**



Source: NW Power Planning Council, from presentation by Ben Kujala at the Resource Adequacy in the Northwest Webinar, May 7, 2020, hosted by the NW Energy Coalition.

**Figure 11. Projected Resource Adequacy in the Northwest**



Source: E3, from presentation by Therese Hampton at the Resource Adequacy in the Northwest Webinar, May 7, 2020, hosted by the NW Energy Coalition.

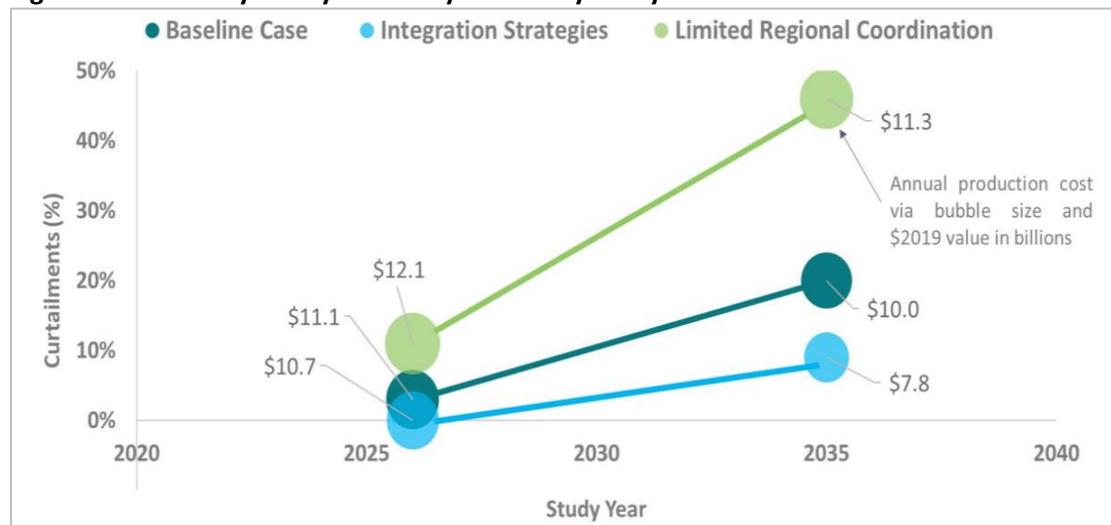
**Benefits of Regional Grid Flexibility and Integration**

As Washington’s electricity sector transitions to 100% clean, issues related to regional grid integration come to the fore. A recent study by the Western Interstate Energy Board (WIEB) concluded that the high

degree of integration and the flexibility that such integration provides could lower regional energy production costs and significantly reduce the potential for renewables curtailments.<sup>9</sup>

As depicted in Figure 12, under baseline business-as-usual assumptions, renewable curtailments could approach 20% of total renewable energy production by 2035. In contrast, in a high integration scenario, curtailments would be less than 10% and production costs would be \$2.2 billion lower than in the baseline case. Limited regional coordination (with no day-ahead market) results in the highest increase in costs (\$11.3 billion in 2035), and leads to renewables curtailment of 50%.

**Figure 12. Summary of Key Flexibility Results by Study Case**



Source: <https://westernenergyboard.org/wp-content/uploads/2019/12/12-10-19-ES-WIEB-Western-Flexibility-Assessment-Final-Report.pdf>, page 10.

These results highlight the potential benefits of regional grid integration. These benefits—along with viable governance structures, market mechanisms, the legacy of regional control of the Northwest’s hydropower system, and other related factors—must be considered as part of the TAP process.

### **Equity as a Central Focus of the Clean Energy Transition**

The TAP process is examining equity holistically as a cross-cutting issue to be addressed by all four sectors, as well as an overarching theme for the SES. Dimensions specific to transitioning the electricity sector to 100% clean energy include:

- **CETA establishes a requirement that all customers benefit from the transition to clean energy through:**
  - An equitable distribution of energy and non-energy benefits and a reduction in the burdens to vulnerable populations
  - Consideration of long- and short-term public health and environmental benefits and reduction of risks and costs
  - Energy security and resiliency

<sup>9</sup> Energy Strategies. December 2019. *Western Flexibility Assessment: Investigating the West’s Changing resource Mix and Implications for System Flexibility* <https://westernenergyboard.org/wp-content/uploads/2019/12/12-10-19-ES-WIEB-Western-Flexibility-Assessment-Final-Report.pdf>.

CETA imposes a requirement to ensure equitable distribution of energy and non-energy benefits (RCW 19.405.040(8)), and establishes that the public interest includes the equitable distribution of energy benefits and reduction of burdens to vulnerable populations and highly impacted communities (RCW 19.405.010). CETA changes the regulatory framework and the expectations that utilities must meet under state law, as utilities must now consider how their system and programs benefit or harm different parts of their customer base. This has implications for the location of generation and transmission facilities, for distributed energy resources, and for the implementation of programs, such as energy efficiency or electrification.

The UTC is currently undertaking a rulemaking process to codify the CETA equity requirements into the regulatory framework for utilities. The Department of Commerce is also conducting an active rulemaking process for CETA. Phase one on renewable resource eligibility and the social cost of greenhouse gas emissions was recently completed. Details on Phase two can be found at <https://commerce.wa.gov/ceta>. The outcomes of these rulemaking will have significant implications for CETA implementation and how the SES addresses equity in the electricity sector.

- **Differential impacts on ratepayers of public and privately-owned utilities.** In general, electricity rates are lower for public power customers in Washington than for customers of IOUs. Similarly, public power has a lower carbon content than electricity provided by IOUs. This means that as the State moves to 100% clean energy, the cost burden will differ across the state, including between customers located in urban and rural areas.

#### 4. Potential Policies and Actions for Consideration

Through the TAP process, the CETI Team will further develop and continuously update this list, conduct background research, and organize discussions for key topic areas with experts and AC members. With this input and subsequent assessment against criteria (see accompanying document Description of Technical Advisory Process), the CETI team will then identify a draft and then final set of electricity sector policies and actions for potential inclusion in the SES.

Types of policies and actions for consideration include, but are not limited to:

- Policies and regulations
- Technology and infrastructure investments
- Programs (government, private sector, civic, collaborative)
- Research, development, and dissemination
- Funding mechanisms (market and institutional)
- Incentives (including economic and non-economic, positive and negative)
- Market capacity and mechanisms
- Institutional capacity and other systemic changes (e.g., alignment, coordination)
- Tracking, disclosure, and communication
- Complementary actions (not specific to the energy sector but needed or helpful to enable the transition, such as workforce development)

These policies and actions can be categorized by different key actors or responsible entities (e.g., state, local, federal, tribal government, private or non-profit sector) as well as by the criteria, and/or cross-cutting issue or gap addressed (e.g. equity, rural/urban, reliability/security).

## 5. Policy Context

The electricity sector is governed by policies and laws enacted by the Washington State legislature, and adopted by state regulatory agencies, as well as by federal law and regulations. A compilation of state energy policies can be found in Appendix A. The most significant legislation relevant to the SES and deep decarbonization is summarized below.

### ***Clean Energy Transformation Act (CETA)***

In addition to establishing the requirements to phase out coal from utility portfolios by 2025, achieve carbon neutrality by 2030, and 100% non-emitting resources by 2045, CETA establishes a comprehensive policy framework to guide the electricity sector through the transition. The UTC and Department of Commerce have initiated rulemaking to develop rules for implementation.

Significant provisions of CETA include:

- Requiring utilities to account for the social cost of GHG emissions in energy efficiency and resource planning. The law sets the social cost of carbon (in 2018 dollars) at \$74/ton in 2020, rising to \$116/ton by 2050.
- A cap on annual increases in costs attributed to compliance at 2% of the previous year's electricity revenue, allowing utilities to be considered in compliance if their costs reach or exceed the cap.
- Providing utilities with flexible ways to meet requirements in early years, including purchasing RECs, investing in energy transformation projects (e.g., electrification, distributed energy, and other projects that reduce GHG emissions), or paying an administrative penalty as a compliance fee.
- Increasing requirements for energy assistance, reaching 60% of eligible customers by 2030 and 90% by 2050.
- Incentives for renewable energy developers to contract with women-, minority-, or veteran-owned firms, pay prevailing wages, and implement projects under a community workforce or project labor agreement.
- Requiring that utilities ensure an equitable distribution of energy and non-energy benefits and reduction of burdens to vulnerable and highly impacted communities resulting from the transition to clean energy.
- Revising utility planning requirements to include the development of clean energy action plans and incorporating resource adequacy metrics, a cumulative impact analysis of benefits to and reduction in burdens on vulnerable and highly impacted communities, and incorporating the social cost of carbon into Integrated Resource Plans (IRPs).

### ***Energy Independence Act, (EIA, I-937)***

- **Qualifying renewable energy requirements:** Large utilities must: 1) obtain 15% of their electricity from eligible renewable resources, such as solar and wind, in 2020 and beyond; 2) pursue all available conservation that is cost-effective, reliable, and feasible ([RCW 19.285](#)). *CETA amended I-937 to allow federal incremental hydropower to count toward renewable requirements and, after 2030, removing the separate renewable requirement for any utility that meets 100% of its annual retail electric load with renewable, RECs, or non-emitting resources.*
- **Energy conservation requirements.** All qualifying utilities must pursue all available conservation that is cost-effective, reliable, and feasible. Utilities must create/update an assessment of all achievable cost-effective conservation potential for the next 10 years every two years and must establish a biennial acquisition target for cost-effective conservation, and meet that target. ([RCW 19.285](#))

***Policies providing incentives for and/or regulations of solar, net metering, efficiency and conservation, electric vehicles***

- **Electric Vehicles:** RCW 80.28.360 (HB 1573) allows utilities to recover an additional incentive rate of return on electric vehicle supply equipment (charging) and requires the UTC to evaluate policy for EVs going forward. The UTC issued policy statement in Docket UE-160799, advising utilities to adopt a portfolio approach to EV programs, and to consult with a broad group of stakeholders, including transportation planning agencies, in developing programs and plans.

***Climate Pollution Limits***

- Sets new GHG reduction targets for the State to meet based on the most recent science and includes sequestration in public lands in the state's climate policy. Targets: 45% below 1990 levels by 2030, 70% below 1990 levels by 2040, net zero by 2050. Biannual report on total emissions including GHG emissions from wildfires required. No new regulatory authority created. Carbon sequestration: all state agencies must seek all practicable opportunities to cost-effectively sequester and store carbon. ([RCW 70.235](#))

**6. Topics for Further Research and Deeper Dive Discussions**

Based on input received at the June 11, 2020 AC meeting and considering the framing questions presented earlier, an initial list of topics for further research and around which to organize deeper dive discussions with experts and AC members includes the following:

**Topic**

**Market and pricing mechanisms** - To address grid integration, capacity, renewables development, distribution system, and other constraints to new and optimal use of existing resources. Topics here include:

- Creating capacity markets; pricing capacity for wholesale markets
- Customer and retail market rates
- Regional market integration and governance

**Distributed Energy Resources** – What are the options, how can they contribute to the solution, what policies and incentives can accelerate their development and adoption?

## Topic

**Transportation and Building Electrification** – How can utilities meet and manage the additional load that comes from electrification, including minimizing peak load capacity issues? What policies and utility sector investments are needed to accelerate electrification? This question links to the market mechanism discussion and transportation and building sectors.

**Resource Adequacy** – Focus on current efforts underway to ensure adequate resources are available, utilities fully realize the potential for cooperative or market-based adequacy mechanisms, and demand response and renewable resources are valued appropriately. Where gaps exist, how should the state direct the electricity sector?

**New Technologies** – Hydrogen focus, liquid fuels, carbon capture, opportunities to accelerate the development of liquid fuels from electricity

**Siting** – Issues and associated solutions to environmentally and socially responsible siting of generation and transmission infrastructure

**Workforce Development** – Cross-cutting topic, with specific needs for the electricity sector

**Equity** – Cross-cutting topic, with specific issues associated with the electricity sector

# Appendix A. Existing Washington State Electricity Policies

## 1. Power Plant Permitting, Emissions, and Generation Efficiency

- 1.1. **EFSEC land use and environmental requirements for certain energy facilities.** Certain energy facilities must meet Energy Facility Site Evaluation Council (EFSEC) land use and environmental requirements, including thermal electric generation facilities, pipelines, electric transmission lines, petroleum refineries and petroleum storage facilities of a certain size, and all alternative energy electrical generation facilities. ([RCW 80.50 RCW](#))
- 1.2. **Regulation of environmental quality relating to energy facilities not covered by EFSEC.** The Department of Ecology regulates air quality, water quality and water resources as they relate to new energy facilities not explicitly covered by EFSEC ([RCW 70.94.161, Operating Permits for Air Contaminant Sources](#); and [RCW 70.94.162, Annual Fees from Operating Permit Program](#))
- 1.3. **CO2 reduction requirements for new fossil fuel plants.** Depending upon the size of the facility, EFSEC or Ecology enforce CO2 reduction requirements for all new fossil fuel plants ([RCW 80.70](#))
- 1.4. **Greenhouse gas emission standard enforcement.** EFSEC and Ecology enforce greenhouse gas emission standards for ([RCW 80.80.040 \(10\)](#)).
- 1.5. **Prohibition on coal-fired power contracts.** Prohibition on long term coal-fired power contracts for all state's utilities ([RCW 80.80](#))
- 1.6. **Clean Energy Transformation Act.** Phases out coal generation by Dec. 31 2025 ([RCW 19.405.030](#)); requires GHG neutrality 2030-2044 ([RCW 19.405.040](#)); requires 100% non-emitting resources as of 2045 ([RCW 19.405.050](#)).
- 1.7. **EFSEC authority on renewable energy project siting.** EFSEC state preemptive authority on siting of all renewable energy projects that choose the EFSEC process ([RCW 80.50.060](#))
- 1.8. **Transitioning off coal.** Specific to the only coal-fired power plant in WA: TransAlta. Will be required to cut NOx emissions by 2013, and permanently shut its two boilers in 2020 and 2025. TransAlta must also make contributions to economic development and energy efficiency as it transitions away from coal in Lewis County. ([RCW 80.80](#), [RCW 43.160.076](#))

## 2. Fuel Mix, Renewable Portfolio Standards, and Green Power Trading

- 2.1. **Fuel mix disclosure.** Fuel mix disclosure to customers required for all electric utilities. ([RCW 19.29A.060](#))

- 2.2. **Renewable portfolio standard for large utilities.** Large utilities must obtain fifteen percent of their electricity from new renewable resources such as solar and wind by 2020. (Initiative-937: [RCW 19.285](#), Energy Independence Act)
- 2.3. **Creating the Sustainable Energy Trust.** The sustainable energy trust program will be overseen by the Housing Finance Commission and provide financing for qualified energy efficiency (EE) and renewable energy (RE) improvement projects that are likely to repay loans. The Commission will also secure the benefits of programs that promote EE and RE for itself and the people of WA. ([RCW 43.180.260](#))
- 2.4. **Voluntary green power purchase option.** Voluntary green power purchase option required of all large electric utilities ([RCW 19.29A.090](#))
- 2.5. **Requiring integrated resource plans for utilities.** Integrated resource plan or resource plan required biennially of all state's electric utilities ([RCW 19.280](#))

### 3. Renewable and Distributed Electricity Sources

*See also subcategory E4 Interconnection and Net Metering.*

*Policies promoting bioenergy for both stationary and mobile applications appear in subcategory T2.*

*Policies promoting renewable natural gas appear in subcategory B2.*

*Waste-to-energy policies appear in subcategory Z4.*

- 3.1. **Anaerobic digester tax exemption.** Anaerobic digester construction and operation, and related services or components, are exempt from retail sales and use taxes. More than half of digester feedstock must be livestock manure. ([RCW 82.08.900](#), [RCW 82.12.900](#))
- 3.2. **Rules governing woodstove use during burn bans.** A person can install or repair a solid fuel burning device (often a woodstove) that meets emissions requirements or replace an uncertified device with a certified one even during a burn ban. During emergency power outages burning wood in a device is unrestricted regardless of whether a burn ban has been called. ([RCW 70.94.473](#))
- 3.3. **Community solar cost recovery.** The cost-recovery incentive program in 5101 is extended to "community solar projects." Community solar projects are eligible for incentives of 30 cents for each kilowatt-hour of energy produced. Each applicant in a community solar project is eligible for annual incentives of \$5,000 per year. (ESSB 6170 – will be codified in [RCW 82.16.110](#) and [RCW 82.16.120](#))
- 3.4. **Incentives for solar systems.** Incentives paid to system owners based on system classification once per year for eight years or until 50% of paid price is earned back. For residential, commercial, shared commercial, and community solar. Bonus for made in WA. Phases out and adjusts incentive rates for rooftop residential and commercial-scale solar. Allows utilities to administer/organize a shared commercial solar project of

between 1 MW and 5 MW with at least 5 participants in WA. Ecology must develop a Stewardship program for collecting and recycling PV panels and begin enforcing that each manufacturer prepare and submit a plan. ([RCW 82.16](#), [RCW 80.28](#))

- 3.5. **Extension of the B&O manufacturing tax on solar energy products.** The preferential B&O manufacturing tax rate for solar energy and silicon products extended to 2027. Construction and renovation to convert a coal-fired power plant into natural gas or biomass plants is exempt from sales and use tax including labor and services and machinery and equipment required. ([RCW 82.04](#), [RCW 82.08](#), [RCW 82.12](#))
- 3.6. **Renewable gas tariffs.** Renewable Gas - Gas utilities must file voluntary renewable gas tariffs and may file tariffs offering customers to supply a specific portion of their gas supply as renewable gas. ([RCW 80.28.385](#), [RCW 80.28.390](#))
- 3.7. **Allowing public utilities to produce and sell renewable natural gas.** Public utilities can now produce and use renewable natural gas (RNG) for internal operations, can sell at wholesale or to end-use customers under some conditions. PUDs cannot sell RNG to an end-use customer of a gas company and cannot own/operate NG distribution pipeline systems serving retail customers directly. ([RCW 54.04.190](#))
- 3.8. **Distributed energy resources planning.** Distributed energy resources planning must: identify data gaps and necessary upgrades; propose monitoring, control and metering upgrades that will provide net consumer benefits; identify potential cost-effective programs, fairly compensate customers for the value of the distributed energy resources, include programs benefitting low-income customers; provide a ten-year plan for distribution system investments; include distributed energy resources in the utility's integrated resource plan; identify cybersecurity measures and future improvements for the next cycle. Procurement of distributed energy must be price-based and technology neutral. ([RCW 19.280.100](#))

#### 4. Interconnection and Net Metering

- 4.1. **Net metering.** Net metering for small renewable systems (RCW 80.60)
- 4.2. **Interconnection standards.** Interconnection standards for small systems (300 kW)

#### 5. Demand-Side Energy Efficiency

- 5.1. **Cost-effective energy efficiency requirement.** Requirement for large electric utilities to capture all cost effective energy efficiency (Initiative-937, Energy Independence Act: [RCW 19.285.040](#))

- 5.2. **Financial assistance for energy conservation projects.** Municipal electric utilities and public utility districts providing electricity may give financial assistance for energy conservation projects. ([RCW 35.92.360](#); [RCW 54.16.280](#))
- 5.3. **Conservation service tariffs.** An electrical, gas, or water company may file a conservation service tariff with WUTC. ([RCW 80.28.303](#))
- 5.4. **Conservation bond issuance.** Electrical, gas, and water companies, or finance subsidiaries, may issue conservation bonds upon approval by WUTC. ([RCW 80.28.306](#))
- 5.5. **Energy Independence Act energy conservation requirements.** All qualifying utilities must pursue all available conservation that is cost-effective, reliable, and feasible. Utilities must create/update an assessment of all achievable cost-effective conservation potential for the next 10 years every two years, and must establish a biennial acquisition target for cost-effective conservation and meet that target. ([RCW 19.285](#))

## 6. Expired/Superseded

- 6.1. **Tax exemption for cogeneration equipment.** Equipment used for a cogeneration facility integrated into a manufacturing site is exempt from retail sales and use taxes. Expired June 30, 2009. ([RCW 82.08.02565](#), [RCW 82.12.02565](#))
- 6.2. **Sales and use tax exemption for renewable energy.** Equipment, labor and associated services for power production greater than 200w from various renewable energy sources, including landfill gas, are exempt from retail sales and use taxes. Expired June 30, 2009. ([RCW 82.08.02567](#), [RCW 82.12.02567](#))
- 6.3. **Tax credit for harvested biomass.** B&O credit is provided for harvesters of harvested green ton of forest derived biomass sold or used for production of electricity, steam, heat or biofuel as follows: from July 1, 2010, through June 30, 2013, \$3 per harvested green ton; and from July 1, 2013, through June 30, 2015, \$5 per harvested green ton. The credit expires June 30, 2015. (ESSB 6170 – will be codified in [RCW 82.04](#), [RCW 82.08](#), and [RCW 82.12](#))
- 6.4. **Sales tax exemption for forest derived biomass.** Sales tax exemption is provided for the sale of forest derived biomass used to produce electricity, steam, heat or biofuel. The exemption expires on June 30, 2013. (ESSB 6170 – will be codified in [RCW 82.08](#), and [RCW 82.12](#))
- 6.5. **Financial support for biofuels from waste.** Energy Freedom Program provides financial support for projects converting farm products, wastes, cellulose, or biogas directly into electricity or biofuel or other co-products. Expires June 30, 2016. ([RCW 43.325.020](#))

- 6.6. **Incentive for electricity production from anaerobic digesters.** Producers of grid intertied power from anaerobic digesters are eligible for .15¢/ KWh incentive payments of up to \$2,000/yr. Expires June 30, 2014. ([RCW 82.16.110](#))
- 6.7. **Wood biomass fuel tax exemption.** Sales of equipment, and related services or components, used for retail sale or use of wood biomass fuel blends containing at least 20% wood biomass fuel are exempt from retail sales and use taxes. Sales of fuel delivery vehicles, and related services or components, are exempt if at least 75% of the fuel is wood biomass fuel blends containing at least 20% wood biomass fuel. Expires July 1, 2009. ([RCW 82.08.960](#), [RCW 82.12.960](#))
- 6.8. **Tax refund for sales tax on renewable energy equipment.** A sales and use tax exemption in the form of a refund is allowed for 100 percent of the sales tax paid on machinery and equipment used to create energy from fuel cells, sun, wind, biomass energy, tidal and wave energy, geothermal resources, anaerobic digestion, and technology that converts otherwise lost energy from exhaust or landfill gas from July 1, 2009, to June 30, 2011. The sales tax exemption is reduced to 75 percent from July 1, 2011, to June 30, 2013. The exemption expires June 30, 2013. (ESSB 6170 – will be codified in [RCW 82.08](#) and [RCW 82.12](#))
- 6.9. **Reduced B&O tax rate for wholesale solar panel and silicon manufacturers.** Beginning October 1, 2009, the B&O tax for businesses that manufacture or sell at wholesale either: (1) solar energy systems using photovoltaic modules; or (2) solar grade silicon and an expanded list of materials to be used exclusively in the components solar systems or semiconductors is set at a reduced rate of 0.275 percent. The lower B&O tax rate expires on June 30, 2014. (ESSB 6170 – will be codified in [RCW 82.04.294](#))
- 6.10. **Sales tax exemption for chemicals needed to produce solar energy equipment.** A sales tax exemption is provided for gases and chemicals used in the production of solar energy equipment. The exemption expires December 1, 2018. (ESSB 6170 – will be codified in [RCW 82.08.9651](#) and [RCW 82.12.9651](#))E4.10
- 6.11. **Sales tax exemption for chemicals needed to produce solar energy equipment.** A sales tax exemption is provided for gases and chemicals used in the production of solar energy equipment. The exemption expires December 1, 2018. (ESSB 6170 – will be codified in [RCW 82.08.9651](#) and [RCW 82.12.9651](#))E4.10
- 6.12. **Colstrip closure.** Puget Sound Energy must close coal-fired Colstrip 1 and Colstrip 2. As of January 2020, both units have been closed. This bill allows utilities to use regulatory liabilities as a fund to cover decommissioning and remediation costs of coal plants that started before 1980. Any extra funds after decommissioning are returned to the ratepayers. ([RCW 80](#))