Attachment 1

Recommendations offered by Climate Solutions, NW Energy Coalition, Northwest Power and Conservation Council and how the recommendations are incorporated in PacifiCorp's Case P-18 in its 2019 Integrated Resource Plan (IRP) progress report (2019 IRP Progress Report).

Recommendation 1[1]:

- Apply the Social Cost of Carbon (SCC) to resources used in the entire Western Electricity Coordinating Council (WECC), but only insofar as these are dispatched to serve customers to avoid unintended consequences
- Avoid applying the SCC to Washington-only facilities
- Avoid applying the SCC to entirety of WECC facilities that are dispatched to utilities outside of Washington

How Case P-18 in PacifiCorp's 2019 IRP Progress Report incorporates these recommendations:

- The SCC was applied to the entire six state PacifiCorp system, across all resources used in the models.
- The SCC was not applied to just Washington-only, and was not applied only to those facilities serving Washington load. The SCC was applied beyond a single state, system wide.
- PacifiCorp does not model the entirety of WECC facilities, only PacifiCorp's system, thus, the SCC was not applied to all of WECC. Note, PacifiCorp dispatches its system as a whole across all six states, which is reflected in the company's IRP modeling. Modeling Washington State in isolation would not account for how the company dispatches resources across states to serve all customers, and thus the derived benefits. Significant added complexity will be required to include specifically the set

[1] Joint Workshop and Discussion - Modeling Greenhouse gas Pollution Costs in Electric Integrated Resource Planning – January 16, 2020. Slide 18

of all resources supplying energy to meet Washington load irrespective of location.

Recommendation 2[2]:

Climate Solutions also recommended that the social cost of greenhouse gases (GHG):

- Should apply to both new and existing resources
- The social cost of any given portfolio will be significantly underestimated if the social cost of carbon is only applied to new resources
- Resource decisions are based on a utility's existing portfolio and its resource need to meet load
- Social cost of GHG should be considered cumulatively

How Case P-18 incorporates these recommendations:

The SCC:

- **Was applied to both new and existing resources in the models**
- The social cost of the P-18 portfolio was not underestimated because the SCC was applied to new resources (as well as existing)
- Resource decisions are based on a utility's existing portfolio and its resource need to reliably meet load. Additionally, resource decisions are dependent on retirements in the existing fleet and the relative economics of existing versus expansion resources, in both operations and used in retirement decisions.
- SCC was considered cumulatively, as it was applied to all years and to the dispatch cost of all emitting resources.

[2] *Id.*

Recommendation 3[3]:

With regards to market purchases, Climate Solutions recommends,

- The SCC for market purchases should reflect the marginal resource

How Case P-18 incorporates this recommendation:

- This recommendation assumes that market purchases should also carry the SCC, treating a purchase as if it were an emitting resource within the company. In PacifiCorp's modeling, the marginal resource would differ potentially for every region and time period of each case, and at best would serve only as a proxy for the actual emitter(s) supplying energy to a sale.
- Note that if any SCC adder were to be applied to market purchases then a credit must also be applied to market sales. This is necessary because the entity generating the energy would also be accounting for the SCC based on their generating emitter, and should remove the SCC if that energy is sold. Otherwise, both the generating entity and the purchasing entity would be paying the SCC for the same energy, resulting in double-counting.
- Regardless of the accounting method, average purchases and sales are reasonably balanced and Front Office Transactions in aggregate are a small portion of the served energy (P-18 annual average Purchases were 467 megawatts (MW) out of approximately 6,850 MW total served energy, thus less than 10 percent). The P-18 system optimizer (SO) Reliability Portfolio Summary outputs file, 'MktTrade-I19-P18-SCCR0000.csv' on the 2019 IRP Confidential IRP data disk demonstrates this balance and as a relatively small portion of served energy.

[3] *Id.*

Recommendation 4[4]:

With regards to the timing of the application of SCC in the models, because SCC influences the dispatch of resources in portfolios, Climate Solutions recommends the following:

- Additional scenarios should reflect the potential for a future carbon pricing policy using this application, such as a $15/ton escalating carbon tax

How Case P-18 incorporates this recommendation:

This recommendation is aligned with how PacifiCorp performed the analysis in the P-18 IRP scenario. The social cost of carbon price derived from the intra-agency work group was applied to every ton of emissions in every scenario used to develop P-18. Emissions and the forward price curve incorporating the social cost of carbon from the work group can be found on the 2019 IRP Confidential data disk.

Recommendation 5[5]:

Since utilities operate facilities without a carbon price, adding the Social Cost of GHGs after economic dispatch may better reflect reality and Climate Solutions recommends:

- Planning adder should be added after the capacity factor and projected dispatch is established

How Case P-18 incorporates this recommendation:

- PacifiCorp's IRP modeling to generate P-18 used the SO model to pick a single portfolio using the social cost of carbon in the SO expansion plan step. Then, the Planning and Risk Stochastic model was run on this portfolio with and without the SCC for comparison. This analysis shows a significant cost difference between a future where

[4] *Id.,* slide 19
[5] *Id.*

expansion resources are operate under the SCC and a future where the resources are first economically dispatched before the SCC is applied. The present value revenue requirement differential is a nearly $11 billion cost when applying the SCC as a cost-driver versus not applying the SCC dispatch driver to this same portfolio.

Recommendation 6[6]:

With respect to which emissions are covered by the application of an SCC adder, Climate Solutions recommends:

- It should be applied at point of generation and to all resources coming into system.

How Case P-18 incorporates this recommendation:

- Modeling used to develop P-18 applies the SCC adder to all generation resources at the point of generation.
- The adder was not applied to market purchases, as described in Recommendation 3 above.

Recommendation 7[7]:

With respect to which emissions are covered by the application of an SCC adder, Climate Solutions also recommends

- Upstream leakage emission be covered and that best available science be used in the calculations.

How Case P-18 incorporates this recommendation:

- The IRP analysis used to develop P-18 and apply the SCC focused on stack emissions

[6] *Id.,* slide 20
[7] *Id.*

where data was available.

- Information on fugitive emissions from gas transportation to gas fired generation facilities is not easily available to the Company since much of it not under the control of the Company.
- Consistent with the recommendation to use best available science, the analytical focus was on accurately and consistently applying costs to known emissions to arrive at the best available information on the impacts of carbon emissions, and subsequently leakage or fugitive emissions were not included in the P-18 analysis.

Recommendation 8[8]:

With respect to costs and cost attribution of the application of SCC, Climate Solutions recommends:

- Utilities need to run Business as Usual (BAU) scenarios without 100% requirements, but using the SCC and other components of the law outside of Sec. 4 and 5 (coal transition, public interest language, low-income assistance, etc.) and that incremental cost should be based on a portfolio of resources with Sections 4 and 5 compared.

How Case P-18 incorporates these recommendations:

- Incremental costs can be calculated by comparing the Present Value of Revenue Requirements (PVRR) of two versions of the P-18 case, one with the SCC applied as a dispatch driver, and one compared to the P-18 case run under price-policy scenario "MMR" (medium gas price assumption with medium CO2 price assumptions, aligned to the 2019 preferred portfolio expected case). The MMR case does not include the SCC as

[8] *Id.,* slide 21

a dispatch driver. These PVRR's are for the system as a whole and are not specific to Washington and Washington providing resources.

- Alternatively, if it is assumed that the P-18 retirements are also driven by the application of the SCC, incremental costs can be calculated by comparing the P-18 SCC case to the 2019 IRP preferred portfolio. This comparison would directly meet the recommendation that costs should be directly attributable to actions necessary to comply, assuming that the application of SCC drives significant early retirements.
- The Company anticipates that these measures will continue to evolve.

Recommendation 9[9]:

With respect to incremental costs of SCC and their application to facilities defined under Public Utility Regulatory Policies Act of 1978 (PURPA), Climate Solutions recommends:

- The SCC adder be specified as an avoided cost in the avoided cost calculation.

How Case P-18 incorporates this recommendation:

- PURPA avoided costs for Washington are calculated in accordance with the rules in Chapter 480-106 of the Washington Administrative Code. The current rules were adopted in July 2019 and do not yet incorporate impacts related to the Clean Energy Transformation Act (CETA). Under the rules, several assumptions are tied to the most recently acknowledged IRP, which for PacifiCorp is its 2017 IRP, which did not contemplate impacts related to SCC. While it contemplated less stringent carbon policies, a solar resource is the next planned resource addition attributable to Washington loads in the 2017 IRP preferred portfolio and used in the determination avoided costs,

[9] *Id.*

and that resource is non-emitting. PacifiCorp recognizes there is an on-going discussion about PURPA avoided costs in Washington and final rules to implement CETA may affect how and where SCC is applied in PURPA avoided costs.

Recommendation 10[10]:

With respect to the application of the SCC, NW Energy Coalition recommends:

- The SCC should generally not be included in the operational costs of existing and new resources in price forecasting models with the exception that SCC applied to new thermal resources in Washington.

How Case P-18 incorporates this recommendation:

- The IRP modeling used to develop P-18 incorporated the SCC as a price-policy scenario, affecting market prices and FOT costs. The SCC was applied to all new and existing resources, across the full PacifiCorp service territory, for expansion plan development in the System Optimizer as well as in the Planning and Risk Stochastic model for dispatch, which simulates operations.

Recommendation 11[11]:

With respect to the portfolio analysis phase, NW Energy Coalition recommends:

- SCC must be included in both thermal generation resource options and conservation operations or else the analysis and resulting resource portfolio may become distorted.

How Case P-18 incorporates this recommendation:

- SCC was included on generation resources that emit.

[10] *Id.,* slide 28
[11] *Id.,* slide 30

- Conservation resources identified in Conservation Potential Assessment and provided to the IRP model are non-emitting resources.
- The IRP model considers all resources simultaneously (generation and conservation) and optimizes.
- Utilizing the NW Energy Coalition recommendation; including SCC "adder" in conservation operations would actually double count the value of SCC and distort the resulting resource portfolio. The current PacifiCorp modeling practice(s) includes SCC in the right place and time to fully capture the non-emitting attributes and value of conservation in the portfolio analysis.

Recommendation 12[12]:

With respect to where to include SCC, NW Energy Coalition recommends

- Including it in dispatch models in addition to (rather than only) in the investment analysis to avoid a model economic "incentive" to run thermal units more because they become more economic the more they run.

How Case P-18 incorporates this recommendation:

- The concern raised by NW Energy Coalition around economics of thermal units is also true for all resources with a combination of fixed and variable costs. They all become becomes less expensive on an output basis the more they operate.
- As outlined above, the P-18 scenario, included SCC in the dispatch model in addition to the investment analysis so any added output from any emitting resource selected by the model(s) has the SCC applied to the added emissions.

[12] *Id.*, slide 31

Recommendation 13[13]:

With respect to application of SCC to market purchase, NW Energy Coalition recommends

- Portfolio analysis should apply a SCC to known imports or contracts based on their emission rate, and an unspecified rate should be assigned to market purchases.

How Case P-18 incorporates these recommendations:

- As described above, SCC was applied to power generated anywhere in the PacifiCorp system.
- As discussed under recommendation 3, a carbon price adder was not included in purchases because a credit was not included in sales. Applying to one requires applying to the other, otherwise there will be double-counting.
- As discussed under recommendation 3, average Purchases and sales are reasonably balanced and Front Office Transactions in aggregate are a small portion of the served energy (P-18 annual average Purchases were 467 MW out of approximately 6,850 MW total retail sales, thus less than 10 percent).

Recommendation 14[14]:

With respect to developing a regional strategy analysis, the Northwest Power and Conservation Council (NWPCC) recommends:

- Assessing the cost and risk associated with different regional investment strategies in different models, specifically Regional Portfolio Model (RPM), and checking strategies of interest in AURORA and GENESYS.

[13] *Id.,* slide 33
[14] *Id.,* slide 53

How Case P-18 incorporates this recommendation:

- The PacifiCorp IRP model set is similar to the model set used by the Northwest Power and Conservation Council.
- The RPM used for expansion plans is similar in function to the PacifiCorp System Optimizer model.
- The Council's GENESYS model is similar in function to the Pricing and Risk model used by PacifiCorp to assess portfolio risks.
- Both organizations use the AURORA model for forward price curves.

Recommendation 15[15]:

With respect to applying GHG emission damage cost in the resource strategy development, NWPCC recommends:

- Using societal cost of CO2e as a proxy damage cost.

How Case P-18 incorporates this recommendation:

- PacifiCorp agrees with treating GHG as a cost driver or damage cost. PacifiCorp utilized CO2 costs in the P-18 analysis since CO2 captures most of the impacts and had the best available data.
- The societal cost of CO2e was not used as the basis for the SCC modeling in P-18.

Recommendation 16[16]:

With respect to accounting for GHG emissions damages in resources strategy development, NWPCC recommends:

[15] *Id.,* slide 54
[16] *Id.,* slide 55

- Accounting for costs in the objective function, in dispatch decisions and in rates and reported costs.

How Case P-18 incorporates this recommendation:

- While the IRP cannot speak to rates, 2019 IRP modeling of case P-18 meets the recommendation to include the SCC in portfolio and dispatch decisions as well as reported costs.
- The total impact of the SCC is accounted for in PVRR calculations which may be compared to other reference or candidate portfolio(s).