WASHINGTON ENERGY STRATEGY ADVISORY COMMITTEE

Meeting 4 Summary

The fourth meeting of the Washington State Energy Strategy Advisory Committee consisted of three separate small-group sessions held on July 23 and July 29. Advisory Committee members divided into three small groups for each session. Participation in each group is listed for each session in the summary, below. The agenda for each session is available here.

The objective of these small group discussions was for Advisory Committee members to identify and discuss critical issues they feel should be considered in the development of policies and actions for the energy strategy. This included issues related to specific sectors as well as cross-sectoral topics and cross-cutting issues of economic development, workforce opportunities, and equity.

Discussions were organized around sessions focused on the electricity sector, transportation, buildings, and industry. For each sector discussion, Advisory Committee members considered a central focus question: *What aspirations and concerns do you see that should be considered as we take steps in the next 10 years to put Washington on a path to meet our long-term climate goals?*

Session 1

July 23, 2020, 1:00 pm to 4:30 pm
Virtual meeting via Zoom

Participants

Advisory Committee Members

- George Caan, Executive Director, Washington Public Utility Districts Association
- **Co-Chair**: Reeves Clippard, Chief Executive Officer, A&R Solar
- Dave Danner, Chair, Washington Utilities and Transportation Commission
- Kathleen Drew, Chair, Energy Facility Site Evaluation Council
- Nicole Hughes, Executive Director, Renewable Northwest
- Chris Roe, Senior Manager, Amazon
- John Rothlin, Manager of Washington Government Relations, Avista Corporation

Commerce, Governor's Office, and Consultant Team

- Marc Daudon, Caspian Group (technical support)
- Roel Hammerschlag, Hammerschlag LLC (technical support)
- Lauren McCloy, Washington Governor's Office
- David Paolella, Clean Energy Transition Institute (technical support)
- Eileen Quigley, Clean Energy Transition Institute (technical support)

Welcome and Agenda Overview

Bill Ross, facilitator from Ross Strategic, reviewed the meeting agenda, including the objectives and focus of discussions. Bill asked participants to share what aspirations and concerns they have as Washington contemplates a robust, low-carbon energy economy, as well as near-term challenges and opportunities related to the ongoing COVID-19 pandemic. Bill noted that this process is not about reaching consensus among Advisory Committee members, but rather collecting advice for the state to consider as it develops the energy strategy.

Sector Discussions

Advisory Committee members discussed key questions, aspirations, and concerns for each sector. Thematic summaries of each discussion are provided below.

Electricity Sector

Transmission and Governance: Advisory Committee members discussed challenges around expanding transmission and highlighted the need to establish a regional governance structure.

- Expanding transmission regionally is difficult due to the multitude of different players, transmission paths, and governance structures. Planning the energy system utility by utility results in inefficiencies in our system. A solution would be to establish a regional governing body that determines how transmission is built and how the costs and benefits of expanded transmissions are allocated. Integration with other regions is critical.
- Building new transmission over the Cascades will take more than thirty years, and it's unclear what the state's role would be in expanding transmission across the state. The state energy strategy should focus on actions that are achievable by the state. Non-wired solutions such as distributed generation and microgrids may reduce the need to expand transmission in the short and medium term.
- It's important to ensure maximization and optimization of existing resources and transmission capacity. Several studies show that the technology exists today to achieve the state's climate goals (with the exception of storage). The state energy strategy should address how resources can be optimized through cost structures or pricing signals.

Regional Markets: Advisory Committee members shared ideas for how to establish a market framework that facilitates and accelerates the transition in the electricity sector.

- Developing regional markets is important to ensure the work the state is doing today will lay the foundation to Washington being part of wholesale energy market.
- There is a need to be careful with markets, as they have the potential to drive lower cost resources to other systems.
- Life in 2050 will look incredibly different, so the state should think about what assumptions it can make about what 2050 will look like and work backwards from there. Markets will likely play a larger role in 2050, so the idea of integrating into a regional market is critical to meeting the state's climate goals. Washington should look to other regional systems and governance structures to learn from as it expands regionally.

- It's important to identify what role the state plays in markets. There is concern that the state energy strategy doesn't assume the state has a singular role in moving markets. The state should prioritize where it has a unique role versus a participatory role in regional markets. The state shouldn't be left behind in discussions around regional markets.

Affordability, Reliability, and Equity: Advisory Committee members discussed the need to ensure our energy system is affordable, reliable, equitable, and adequate.

- The state energy should lay out the following objectives: 1) achieve the lowest carbon emissions possible; 2) maintain affordable electric service; 3) maintain reliable and adequate electric service; and 4) address the state's equity issues. The state should take a methodical and analytical approach to addressing these issues.
- The state should think about the energy strategy more in terms of a "transition" rather than a "transformation." Achieving the state's goals will require incremental steps, such as taking an inventory of every issue, and determining who has jurisdiction over each piece of those issues.
- The renewable portfolio standard and CETA have already charted a course to decarbonization, and there is concern about adding more costs on top of existing programs to meet Washington's climate targets.
- In terms of the impact on consumers due to COVID, Washington residents who are struggling to pay their bills today will likely have ongoing struggles for years.
- As the state shifts to more intermittent resources, there will be a need to maintain baseload resources. In terms of equity and affordability, the lights going out will have the most inequitable impact on low-income households.
- Looking forward, it's important to remove the black box around the state's distribution system that communicates with the utility system to balance out demand and generation all the way to the resource. This will be a challenge as coal plants are shut down. Reliability should be viewed across the entire region, not just utility by utility.
- The make-up of the leadership of Washington's public utilities is not representative of the community itself: low-income and rural communities are not well-represented and therefore their needs aren't understood. The state energy strategy should provide opportunities (e.g., through a workshop) for rural and low-income communities to speak for themselves on the issues they face around electricity access, burden, etc.
- There is a lot of frustration in low-income communities around the high upfront costs of distributed renewables. Given the high upfront cost to buy into community solar, there is a need to rethink ownership models to allow low-income households to participate.
- It's important to ensure equitable opportunities in the renewable energy workforce. Washington licensing rules essentially require a four-year degree to install solar, which isn't necessary. There are opportunities to engage with farmworkers, who could carry out installation during their offseason.

Transportation

Electric and Alternative-Fuel Vehicles: Advisory Committee members acknowledged that the state will not be able to meet climate goals and transportation needs through electrification alone. Discussion of EVs and alternative-fuel vehicles included different vehicle market segments, infrastructure, and grid capacity.

- Although electrification alone will not be enough to meet the state's climate goals and transportation needs, it will play a crucial role.

- Widespread EV adoption will require additional grid capacity, especially in growing rural areas that will need more significant capacity upgrades than urban areas.
- Before the state invests heavily in EV infrastructure, it's important to understand the behavioral aspect of how people will use their EVs. The transportation sector is predicated on human acceptance and behavior, which may be more complicated to plan for than the supporting technology. Financial incentives can be used to encourage optimal charging times.
- The grid distribution system can be a constraint to supporting electric last mile delivery.
- Roughly one-third of solar owners also own a plug-in EV, so the state should look at vehicle-to-grid technologies to enhance grid-to-vehicle integration.
- End-of-life issues for EV batteries should be considered. It's important to think about the disposal and reclamation processes that the state wants to have in place, such as repurposing batteries for grid storage.

Reducing Vehicle Miles Traveled (VMT): Advisory Committee members acknowledged that reducing VMT is the most effective way to reduce transportation-related emissions.

- Passenger vehicles are not necessarily the best option – bike commuters, electric buses, etc. should also be included in the transportation strategy.
- Increased broadband will play a crucial role in reducing VMT for rural communities as it opens up more telework options for employees.

Decarbonizing Aviation: Advisory Committee members noted the importance of considering alternative fuels for the aviation sector.

Equity Considerations: Decarbonizing the transportation sector offers equity challenges and opportunities for the state to consider.

- The low carbon fuel standard hoped to tie local generation with EV charging infrastructure, which excludes rural communities in that it does not allow for investment in infrastructure in rural communities. It's important to look at other ways to invest in generation capacity in rural communities.
- Data equity and access to broadband are important solutions to consider. If rural communities had access to high-speed internet, they could telework more effectively, reducing time spent commuting and vehicle miles traveled.
- In terms of equity, it's important to look at infrastructure solutions for urban residents who don't have access to home charging.

Buildings

Energy Code and Building Performance Standards: Advisory Committee members noted that building codes for new buildings should be a key component of decarbonizing the state energy sector.

- A well-designed building code will be necessary to reduce emissions from the building sector. This should be incremental, as it's challenging to make big changes in a short amount of time.
- Hardwiring energy through building codes is much more viable than making retrofits to older buildings. There is a need to look at opportunities for upgrades to old buildings through remodels or a natural upgrading of the housing stock.

Financing Mechanisms: Advisory Committee members discussed the need for new financing mechanisms and incentive structures to encourage energy efficiency measures in buildings.

- In the rental market, there isn't the right incentive for building owners to invest in energy efficiency improvements that would benefit tenants. There is a need to align incentives between tenants and owners so that both parties are able to participate and see the benefits of energy efficiency updates.
- It's important to think about incentives in rural communities – how to defray the upfront costs of energy efficiency measures and spread those out over time.

Clean Fuels: Advisory Committee members noted the importance of maintaining a diversity of fuels in buildings, including natural gas.

- High-efficiency renewable natural gas has a role to play in a low-carbon economy. In colder climates, natural gas is an efficient source of heating.
- Renewable natural gas is an important resource for rural communities and farmers to be able to maximize their resources for nutrient recovery or generating electricity. It's important to keep doors open on existing resources so the state doesn't miss out on existing opportunities.

Embodied Carbon: Advisory Committee members highlighted the importance in looking at building material and associated emissions.

- The embodied carbon of building materials can be a significant portion of overall building emissions. It's important to look upstream at the embodied carbon of the building materials within the building sector. For example, the state should look at timber and lower carbon concretes as alternative materials.

Industry

Innovation: Advisory Committee members noted the need to focus on how the industry sector will contribute to emissions reductions as part of the state energy strategy.

- Different industries have different opportunities to reduce emissions by virtue of their energy intensity and market sensitivities. The state energy strategy should be nimble enough to accommodate the various industries in the state.
- There is a need to measure and report emissions to find the appropriate measures to reduce the carbon intensity of industrial sector emissions. Measuring and reporting are crucial for the industrial sector to determine where to make investments to reduce emissions.
- Carbon taxes and carbon cap-and-trade are effective ways to move the industrial sector toward decarbonization.

Industry Retention: Advisory Committee members shared policy ideas the state should consider for retaining and regulating industry.

- State industrial policy should include efforts to increase efficiency to reduce emissions associated with industrial carbon pollution.
- The state needs to think about where it wants to retain industry, and how to ensure it's running as efficiently as possible. It's also important for the state to consider whether it wants to encourage new industry growth, and where there are opportunities to do so.

Public Comments

- Sarah Vorpahl, with Washington Department of Commerce, asked the Advisory Committee to ground conversations in the realities of the regulatory environment. As someone working on the

implementation of CETA, it's important to understand the reality of how decisions are made in Washington so that we can find solutions that work for various regulatory environments.

Wrap Up and Next Steps

Bill thanked meeting participants for attending and providing thoughtful feedback on challenges and opportunities in each sector. The themes and key points from the discussions are useful inputs into the Technical Advisory Process (TAP) and the continued work of the State Energy Strategy Advisory Committee as it continues to develop recommendations throughout the year.

Session 2

July 23, 2020, 1:00 pm to 4:30 pm
Virtual meeting via Zoom

Participants

Advisory Committee Members

- Will Einstein, Director of Product Development and Growth, Puget Sound Energy
- Martin Gibbins, Water Issues Chair, League of Women Voters
- Matt Harris, Director of Government Affairs & Asst. Executive Director, Washington State Potato Commission
- **Co-Chair**: Nancy Hirsh, Executive Director, NW Energy Coalition
- Paul Jewell, Policy Director, Washington State Association of Counties
- Dan Kirschner, Executive Director, Northwest Gas Association
- Bruce Martin, Energy Resource Manager, WestRock Tacoma
- Clay Norris, Power Management Manager, Tacoma Power
- Alex Ybarra, Representative, Washington State Legislature

Commerce, Governor's Office, and Consultant Team

- Aditi Bansal, Clean Energy Transition Institute (technical support)
- Tom Beierle, Ross Strategic (facilitation support)
- Glenn Blackmon, Washington State Department of Commerce
- Derik Broekhoff, Stockholm Environment Institute (technical support)
- Andy Chinn, Ross Strategic (facilitation support)
- Kate Kelly, Washington State Department of Commerce
- Nicole Larson, Clean Energy Transition Institute (technical support)
- Poppy Storm, 2050 Institute (technical support)

Welcome and Agenda Overview

Tom Beierle, facilitator from Ross Strategic, reviewed the meeting agenda, including the objectives and focus of discussions. Tom reminded participants to consider what opportunities arise as Washington

contemplates a robust, low-carbon energy economy, as well as near-term challenges and opportunities related to the ongoing COVID-19 pandemic.

Sector Discussions

Advisory Committee members discussed key questions for each sector. Thematic summaries of each discussion are provided below.

Electricity Sector

Decarbonization and Electrification: Advisory Committee members discussed the benefits of keeping the focus of the energy strategy on a broad suite of pathways for decarbonization rather than emphasizing particular approaches like electrification.

- Focusing on electrification as the predetermined pathway to the state's decarbonization goal could exclude certain options that could contribute to decarbonization. For example, district energy systems are resilient, distributed and produce lower carbon emissions than other systems but may use natural gas as a fuel source.
- Carbon capture and storage could also provide an opportunity for continuing to use fossil fuels as an energy resource in the state energy system.
- Fish passage concerns and associated dam removal projects may erode some of the state's existing carbon-free resources.

Phased Transition to Decarbonized Energy System: Advisory Committee members discussed the need to develop a phased approach to transitioning the energy system, in light of the resources and time needed to achieve decarbonization.

- The state energy strategy could be considered in phases, beginning with a discussion of the time period over which certain milestones will be reached leading to decarbonization by 2050. There could be multiple interim solutions to work toward the decarbonization goal, including those that use current infrastructure in different ways.
- Energy providers are struggling to figure out how to comply with CETA requirements, so a phased approach makes sense.
- Utilities should have a reliability target for the energy system as it evolves; this will drive decisions around, for example, keeping natural gas plants on-line as part of the state energy mix in order to ensure a reliability target can be met.
- The state energy strategy should include flexibility, allowing utilities to transition at different rates and in different ways; it should avoid punitive measures for utilities that are unable to make certain improvements.
- Building additional fossil fuel infrastructure may preclude the state from meeting its decarbonization goals; however, a blanket prohibition on building fossil fuel infrastructure may limit the capacity for the energy system to be flexible as the transition to decarbonization is made.

Innovation: Advisory Committee members noted the need for innovative approaches and technologies to move the energy system towards decarbonization.

- It is important to consider how the portfolio of customer-side resources and demand-side strategies can be made more robust through creative approaches in areas such as energy

efficiency, smart grid tools (demand response, load control), community projects, distributed generation, and distributed storage.
- Hydrogen could be an important energy source with a flexible load that could also be used in the electricity and transportation sectors. If hydrogen is built out in Washington, it will require significant research and development, but it could turn Washington into a carbon-negative state if it is exported.
- Managing capacity and peak energy use, and creating short-term, long-term, and seasonal storage will be critical to decarbonizing the energy sector.

Investment: Advisory Committee members discussed various strategies to drive investments in clean and renewable energy development, where resources will come from, and how they will be deployed.

- Clear long-term policy goals for renewable energy have helped encourage the growth in clean energy we have seen across the West over the last 20 years. Setting clear goals is critical to drive investment decisions and research and development that will contribute to long-term goals. Uncertainty hampers investment and innovation.
- There are various ways to enable investments in clean energy, such as a green bank to fund energy transition needs.
- Designing policies that increase energy costs will be harmful if companies choose to invest elsewhere or move businesses out of the state. This is especially true for energy-intensive trade-exposed industries. It may not reduce emissions if carbon shows up somewhere outside of the state from an industry that has relocated or invested elsewhere.
- In order to invest in and implement new strategies, utilities will need greater ability to recover costs from a broader set of investments and programs than currently allowed.
- One of the challenges to investment and innovation is the lack of a price on carbon in the state.
- Transitioning to a modern grid will require significant investment in new technology infrastructure, and the total costs – and resources that will be provided by the state – are not known.

Transportation

Electric and Alternative-Fuel Vehicles: Discussion of EVs and alternative-fuel vehicles included different vehicle market segments, infrastructure, and grid capacity.

- Policies that increase the share of light-duty EVs will be helpful to decarbonize the transportation sector. However, zero or low carbon technology for heavy duty and farm vehicles is not at the same stage of development, and fleet operators will currently usually choose a diesel vehicle rather than pay the additional cost for a lower emitting vehicle (e.g., natural gas-powered truck).
- Equity is a significant issue in transportation as newer, cleaner vehicles are more expensive both for private and commercial applications.
- Electric and alternative-fuel vehicles will require infrastructure development, which involves significant up-front capital costs. One approach to accelerate investment in infrastructure is for publicly owned fleets to develop alternative charging/fueling infrastructure that could then be made accessible to others.
- Utilities can play a leading role in developing EV infrastructure if enabled by rules that allow changes in rate design, cost recovery, etc.
- Electrified transportation will require additional grid capacity, and there is not enough to meet the demand if all passenger vehicles in the state convert to electric. Hydrogen vehicles, would

lower the demand for new grid capacity for electrifying all cars (although hydrogen requires significant electricity to create it.)

Reducing Vehicle Miles Traveled (VMT): Advisory Committee members recognized that decarbonizing the state transportation sector is not limited to EVs and alternative-fuel vehicles and should include strategies that reduce VMT and associated emissions.

- VMT reduction strategies could include incentivizing large employers to offer telework opportunities to their employees, changing building codes to increase density, and transit-oriented development.
- Increased broadband access can enable reduced commuting and GHG emissions as it opens up more telework options for employees.

Buildings

Energy Efficiency in Buildings: Advisory Committee members noted that energy efficient buildings are a key component of decarbonizing the state energy sector.

- Fully decarbonizing existing buildings will be challenging because natural gas is a key source of heat for many. Commercial and residential buildings using natural gas for heating contribute approximately 8% of the state's total GHG emissions, but in the winter natural gas delivers approximately 90% of the energy to heat those buildings.
- Replacing older, more inefficient natural gas boilers should also be part of the strategy to decarbonize the building sector.
- Incentivizing smaller, more energy efficient homes is a potential strategy for building sector decarbonization.

Multi-functional Role of Buildings: Advisory Committee members agreed that buildings can provide multiple climate benefits, including carbon capture and energy generation.

- Building construction can have multiple decarbonization benefits including carbon capture and storage in wood products and use of engineered wood in place of steel. Development standards, building codes, and building design are all potential decarbonization opportunities. Buildings can also generate power to contribute back into the grid.
- Smart buildings can be integrated so that utilities and customers can control usage and provide opportunities for system optimization.

Equity Challenges and Opportunities: The building sector contains multiple equity challenges and opportunities that the state energy strategy can take on.

- Not everyone can afford new construction with a carbon-free footprint and affordability is a serious consideration, although there are examples where affordable housing developers have been able to build close to net zero energy buildings with relatively low additional costs.
- Workforce development and equity should be part of the strategy around decarbonizing buildings, with training for energy efficient retrofit jobs, as well as targeting traditionally underserved communities with the (traditionally) lowest quality building stock.

Financing Mechanisms: Advisory Committee members discussed the need for new financing mechanisms to incentivize climate-friendly building activities.

- It is important to consider alternative financing strategies that provide incentives for energy efficient upgrades and overcome the barrier of upfront costs (e.g., property assessed clean

energy financing – PACE). Retrofitting existing housing stock is a huge challenge and will require these types of creative financing mechanisms to increase energy efficiency.

Industry

Effect on Existing Industries: Advisory Committee members discussed how moving toward decarbonization could impact existing industries and jobs.

- There is no guarantee that the growth of green energy jobs will be sufficient to offset the loss of industrial jobs that could occur if the state decarbonizes the energy sector. Energy-efficient trade-exposed industries with low profit margins and high energy use are the most impacted by increased energy costs, and those industries could be lost. It is cheaper to retain an existing job than create a new one.
- Even energy-intensive trade-exposed industries have opportunities to become more energy efficient and can reduce emissions in other ways, such as on-site energy generation.
- The state may need to prioritize retention of some industries over others.

Financing and Incentives: Advisory Committee members discussed various mechanisms to provide resources to the industrial sector during the transition to decarbonizing the energy system.

- It could be a significant burden for the state to provide funding to industries to incentivize energy efficiency gains; a more useful strategy could be something like a one-time tax break, which would avoid the need for the state to create a dedicated fund.
- A green bank or a model like Energy Trust of Oregon (which administers a fund that is resourced through utility customers' bills) are models for the state to consider as a way to provide financing for higher risk, longer payback projects.
- Incentives for industry could be targeted to achieve co-benefits like cleaner air and local economic opportunity to address equity issues.

Public Comments

- Carol Sim, WSU, commented that she is convening a similar workgroup on promoting a successful sustainable aviation fuel industry in Washington. There are several pathways for converting feedstock of different types of aviation fuels. These will require incentives, but there are currently many businesses interested in moving to the state if the investment climate is appropriate. There are many synergies between the aviation fuels workgroup and the State Energy Strategy Advisory Committee that could be explored as both groups move forward.

Wrap Up and Next Steps

Tom thanked meeting participants for attending and providing thoughtful feedback on challenges and opportunities in each sector. The themes and key points from the discussions are useful inputs into the Technical Advisory Process (TAP) and the continued work of the State Energy Strategy Advisory Committee as it continues to develop recommendations throughout the year.

Session 3

July 29, 2020, 1:00 pm to 4:30 pm
Virtual meeting via Zoom

Participants

Advisory Committee Members

- Jason Campbell, Chief Executive Officer, Sovereign Power
- Reuven Carlyle, Washington State Legislature
- Deric Gruen, Program Director, Front and Centered
- Kent Lopez, General Manager, Washington Rural Electric Cooperative Association
- Patrick Oshie, Member, Northwest Power and Conservation Council
- Rebecca Ponzio, Climate & Fossil Fuel Program Director, Washington Environmental Council
- Jessica Spiegel, Director Northwest Region, Western States Petroleum Association
- Dan Wilson, President, Local 338 United Steelworkers

Commerce, Governor's Office, and Consultant Team

- Aditi Bansal, Clean Energy Transition Institute (technical support)
- Tom Beierle, Ross Strategic (facilitation support)
- Glenn Blackmon, Washington State Department of Commerce
- Derik Broekhoff, Stockholm Environment Institute (technical support)
- Michael Furze, Washington State Department of Commerce
- Betony Jones, Inclusive Economics (technical support)
- Kate Kelly, Washington State Department of Commerce
- Nicole Larson, Clean Energy Transition Institute (technical support)
- Heather Martin, Ross Strategic (facilitation support)
- David Paolella, Clean Energy Transition Institute (technical support)
- Eileen Quigley, Clean Energy Transition Institute (technical support)
- Poppy Storm, 2050 Institute (technical support)

Welcome and Agenda Overview

Tom Beierle, facilitator from Ross Strategic, reviewed the meeting agenda, including the objectives and focus of discussions. Tom reminded participants to consider what opportunities arise as Washington contemplates a robust, low-carbon energy economy, as well as near-term challenges and opportunities related to the ongoing COVID-19 pandemic.

Sector Discussions

Advisory Committee members discussed key questions for each sector. Thematic summaries of each discussion are provided below.

Electricity Sector

Human-Centric Approach: Advisory Committee members framed concerns and aspirations for the electricity sector around the impact, role, and opportunities for Washington consumers and residents.

- Transitioning the energy system will significantly depend on consumer decisions and behaviors. People are the "wild card" in any system.
- We should provide customers with a broad range of choices that enable them to benefit from and contribute to a clean electricity sector by undertaking energy efficiency measures, demand-response opportunities, and distributed generation. We should enable these choices through smart grid investments and technology like smart meters, etc. We should streamline program delivery and encourage these customer choices through incentives.
- Different types of customers will face different types of opportunities and barriers (e.g. in remote communities where infrastructure and options are limited). We should help overcome barriers to access to help ensure that opportunities are broadly available to low-income customers and communities.
- Financial incentives work for some people but not all. For those with higher incomes, an incentive might not change behavior, while those with lower incomes might need assistance to meet new requirements or standards. The state should target financial support and incentives to where they are most needed and effective.
- Enabling utilities to offer a broad range of customer-facing options may require changes to utility regulation (e.g., revisions to cost-effectiveness tests) and/or new institutions--for example a Washington version of the Energy Trust of Oregon.
- For customers, too many technologies to support conservation measures (e.g., smart thermostats) can lead to technology fatigue. The state should consider options that are easy for customers to adopt.
- The state should consider the energy strategy's impact on people, including how they are affected by reliability, cost, and access in the electricity system. An "energy safety net" can help ensure availability and affordability for low-income communities throughout the state.

Demand-Side Management: Drawing on discussions about a human-centric approach (see above), the Advisory Committee members emphasized the importance of demand-side approaches in the state energy strategy.

- The state should consider ways to shave peak loads through demand response programs and incentives. These can reduce costs for customers and the electricity system as a whole. New demand response programs may require new legislation and rules.
- Smart grid investments and customer technologies like smart meters will be needed to expand the range and value of demand-side efforts.

New Technologies: Advisory Committee members noted the importance of the state energy strategy maintaining openness to new technologies and innovation.

- CETA is technology neutral, meaning it puts no restrictions on innovation or technology. As we look forward to 2050, there will be new technologies and changes in technologies available that we may not recognize now. It's important that the state energy strategy enable a broad range of technologies and encourage innovation.
- The state should be willing and ready to adopt new technology in the future, avoiding restrictions on technologies that may help meet the state's climate goals.
- We should track progress on the energy strategy, evaluate, and adapt our approach over time.

Generation Resources: Advisory Committee members shared ideas for new generation (energy and capacity) resources that will be needed to meet expected electricity demand in a low-carbon future.

- For siting new generation, local zoning regulations can be a significant challenge. For example, there's a lot of opportunity for small wind turbines and distributed generation around the state, but local permitting regulations can be burdensome. Washington could facilitate siting, such as through a state-wide wind energy map and/or geothermal resource map.
- Community solar offers a big opportunity in the future, but there is a need for net metering for it to be financially attractive for customers.

Equity Considerations and Maximizing Co-benefits: Advisory Committee members discussed the need to ensure our electricity system is affordable and equitable.

- When making investments in the electricity (and other) sectors, we should maximize co-benefits including health improvements and jobs, especially for low-income communities. Where we are retiring energy assets and infrastructure, we should plan for clean-up as appropriate.
- From a ratepaying perspective, when one customer is not purchasing power from utilities, other customers bear that burden. In terms of equity and energy burden, the state energy strategy should ensure that as the state increases conservation of energy, costs are not loaded onto customers that can't afford to acquire those conservation resources.
- There is a need to deepen understanding of tribal communities and how policy can either create opportunities or obstacles for tribal populations. Much electricity infrastructure in remote tribal communities is limited. It's not clear which technologies and policies will benefit these tribal communities. Working with tribal communities, the state should examine different types of community infrastructure and needs to inform investment decisions, including whether to invest in technology at the household level or at the system/grid level.
- Improving access to capital and living wage jobs opportunities is critical to ensuring equal opportunity and access to Washington's energy system.

Transportation

Vehicle Electrification and the Grid: Advisory Committee members shared ideas for how the electricity system will need to change to enable a future transportation system increasing powered by electricity.

- Electrifying various aspects of the transportation sector will require additional grid capacity to meet the growing electricity demand. One challenge includes neighborhood transformers and whether there is enough capacity to handle more households charging their vehicles.
- Utilities will need to better understand their customers' demand for electric vehicles and how to prepare for a future in which their distribution system will need to be upgraded to support charging.

Equity, Access, and Economic Development: Advisory Committee members shared equity concerns related to electrifying transportation, including the distribution of jobs, accessibility, and affordable mobility for urban, suburban, and rural communities.

- Transitioning to electric and alternative-fuel vehicles will require significant upfront capital costs for new vehicles and charging/fueling infrastructure. Infrastructure investments will have different implications and impacts in rural versus urban parts of the state. For example, investments in electric vehicles and electrifying transit work well in densely populated urban

areas but won't benefit less-populated rural areas. It's important to acknowledge that more than one strategy is needed to address different areas and communities of the state.
- It's much easier to incentivize transportation electrification in urban areas and the I-5 corridor. Shifting to transportation electrification will be more difficult in areas of the state where people travel longer distances on daily errands. Longer transition times or other approaches to reducing transportation emissions may be necessary in these areas.
- For low-income communities, affordability and access to charging are barriers to adopting electric vehicles.
- It's useful to think about transportation as part of Washington's economic engine and recovery. Investments in charging and alternative fueling infrastructure create job opportunities for construction and maintenance. The energy strategy should support workforce development and workforce training to broaden access to these jobs.

Medium and Heavy-Duty Vehicles: Advisory Committee members noted that the energy strategy should not just address passenger vehicles, but also medium and heavy-duty vehicles where low carbon options are currently more limited.

- There are key issues for the state to consider around heavy freight and larger vehicles. Newer passenger vehicles are not contributing to as much GHG emissions as larger and older heavy-duty vehicles.
- For businesses, it can be very expensive to replace older heavy-duty vehicles in their fleets. As the state moves to decarbonize the transportation sector, there is a need to assist those businesses to replace the vehicles in their fleet. Using incentive structures rather than mandates should be considered to encourage the behavior the state would like to see.
- There are some types of vehicles for which electrification isn't currently an option and may remain difficult over time, such as agricultural equipment.

Alternative Fuels and Other Transportation Modes: Advisory Committee members discussed various alternative fuels and technologies that the state should consider for market development and research as part of its transportation strategy.

- Hydrogen fuel may be a viable solution for trucking and passenger vehicles. It would be valuable to have an analysis of how much hydrogen and alternative liquid fuels will be available over time for the transportation sector and their best uses.
- The energy strategy should include strategies for cleaner fuels in shipping and aviation, as these sectors are difficult to electrify. For shipping, there is some potential for short-trip electrification, but electricity is not the right option for transoceanic ships or aviation. Liquid fuels will likely be needed for shipping and aviation in the near-term. Looking forward, the state will need to consider the availability of alternative clean fuels to address these sectors.

Reducing Vehicle Miles Traveled (VMT): Advisory Committee members noted that reducing VMT is an important aspect to decarbonizing the state transportation sector.

- Increased broadband access for rural communities will open up more telework opportunities for rural communities, while reducing VMT and associated emission of long commutes.
- VMT reduction is strongly influenced by land use planning, such as increasing density and encouraging transit. These influence the housing market and housing affordability, which can cause displacement.

Market Development and Predictability. Advisory Committee members noted the value of creating predictability about the future of transportation in the state to guide investments and accelerate market development.

- Setting targets and dates for transportation sector adoption of low-carbon technologies (e.g., adoption of electric passenger vehicles) creates predictability (and reduces uncertainty) that can inform infrastructure investments like grid expansion and installation of charging infrastructure in new or remodeled buildings.
- Commitments to adopt zero or low carbon vehicles in public fleets can help accelerate market development. The buying power of the public sector is under-utilized, including public sector buying of electric maritime products, etc.

Co-benefits of Transportation Investments. Advisory Committee members discussed how transportation investments can advance other state goals.

- Transportation investments and transitions should take advantage of opportunities in other areas, such as culvert replacement, new building construction, and building retrofits.
- Investments should be targeted at co-benefits, for example where improving transportation can increase access to jobs and reduce emissions in vulnerable communities.

Buildings

District Energy Utilities: Advisory Committee members shared ideas about district energy utilities as part of the state's efforts to decarbonize the building sector.

- The state should consider the role and value of district energy utilities, which pump hot water for heating in the winter (in some cases, waste heat) and/or cold water for cooling in the summer. They may be most appropriate in and around campuses and state facilities, which can act as "anchor customers."

Industrial and Manufacturing Buildings. Advisory Committee members suggested that all types of buildings should be considered in the energy strategy.

- There are ample opportunities for energy efficiency in industrial and manufacturing buildings. These are much easier and less expensive to incorporate into new buildings. Retrofits of existing industrial and manufacturing buildings can be difficult and expensive, although some measures can be relatively easily implemented (e.g., converting to LED lighting).
- District utilities and process heating are opportunities for industrial and manufacturing facilities.

Embodied Carbon: Advisory Committee members highlighted the importance of looking at building material and associated emissions.

- The purchasing power of the state should be better utilized to purchase low-carbon building products. Using public funding to support the state's goals in the building space would be a powerful tool that has been underutilized at both the state and local level.
- Purchasing materials from within the state (domestic content and local sourcing) lowers transportation-related emissions and costs.

Use of Fossil Gas in Buildings. Advisory Committee members discussed planning and investments about the future of fossil gas in buildings.

- Concerns about abandoning existing natural gas infrastructure are less of an issue for new buildings, which should be developed without fossil gas.

- The state should start planning now for the impacts of reduced use of natural gas, including job and training opportunities for plumbers and pipefitters and how to avoid negative impacts to customers of spreading system costs over a shrinking customer base.

Equity Challenges and Opportunities: The building sector contains multiple equity challenges and opportunities that the state energy strategy can take on.

- Washington has a homelessness and housing crisis. There's a need to ensure that decarbonizing buildings doesn't make them less affordable to low-income communities.
- Workforce development and equity should be part of the strategy for decarbonizing buildings, with training for energy efficient retrofit jobs. Quality and work standards can help ensure adequate work conditions and fair compensation.
- Affordable housing should be integrated into the state's climate goals.

Financing Mechanisms: Advisory Committee members discussed the need for new financing mechanisms to incentivize low carbon buildings.

- It is important to consider alternative financing strategies that overcome the upfront costs of energy efficiency upgrades, which are a barrier for home and building owners.
- Tenants/renters and owners may have different incentives and/or barriers for energy efficiency upgrades. Financing strategies can help utilities, building owners, and tenants work together to realize the benefits of energy efficiency measures.

Industry

Equity Considerations: Advisory Committee members noted that decarbonization strategies for industry can also address health inequities related to industrial sector pollution.

- As the state looks at the industrial sector, it should examine opportunities to reduce GHG emissions as well as local pollutants. It's important to look at the communities that are hit hardest by local pollutants caused by industry.

Industry Retention and Workforce: Advisory Committee members discussed how moving toward decarbonization could impact existing industries and jobs.

- Affordable energy is necessary to keep industries in the state. If energy costs are too high, the state may lose industries to other states that are less regulated.
- New clean energy jobs are often lower-paying than industrial jobs that can be lost if industries close down or move. Over the long-term, helping Washingtonians get higher-value jobs in a clean energy economy will require changes to the public education system and training opportunities, including improve math and science programs, apprenticeships, and training in trades at the high school level, and post-secondary paths other than a four-year degree.
- Leakage of industry to other states may not decrease Washington's carbon footprint. There are emissions associated with the import and transport of manufactured goods. It's important for the state to look at emissions from consumption as well as production.

Financing and Investment: Advisory Committee members discussed various mechanisms to provide resources to the industrial sector during the transition to decarbonizing the energy system.

- It could be a significant burden for the state to provide funding to industries to incentivize energy efficiency gains. There may be some model that works for the industrial transition that

needs to happen – whether in the form of tax relief tied to requirements or investing in industrial workforce.
- Uncertainty in new technologies and energy resources presents challenges for industry to invest in the future.

Public Comments

- Karin Landsberg, from Washington DOT, asked a process question about when we can expect to see Meeting 4 recordings online. Commerce will post recordings on the Washington Energy Strategy website within a few days.

Wrap Up and Next Steps

Tom thanked meeting participants for attending and providing thoughtful feedback on challenges and opportunities in each sector. The themes and key points from the discussions are useful inputs into the Technical Advisory Process (TAP) and the continued work of the State Energy Strategy Advisory Committee as it continues to develop recommendations throughout the year.