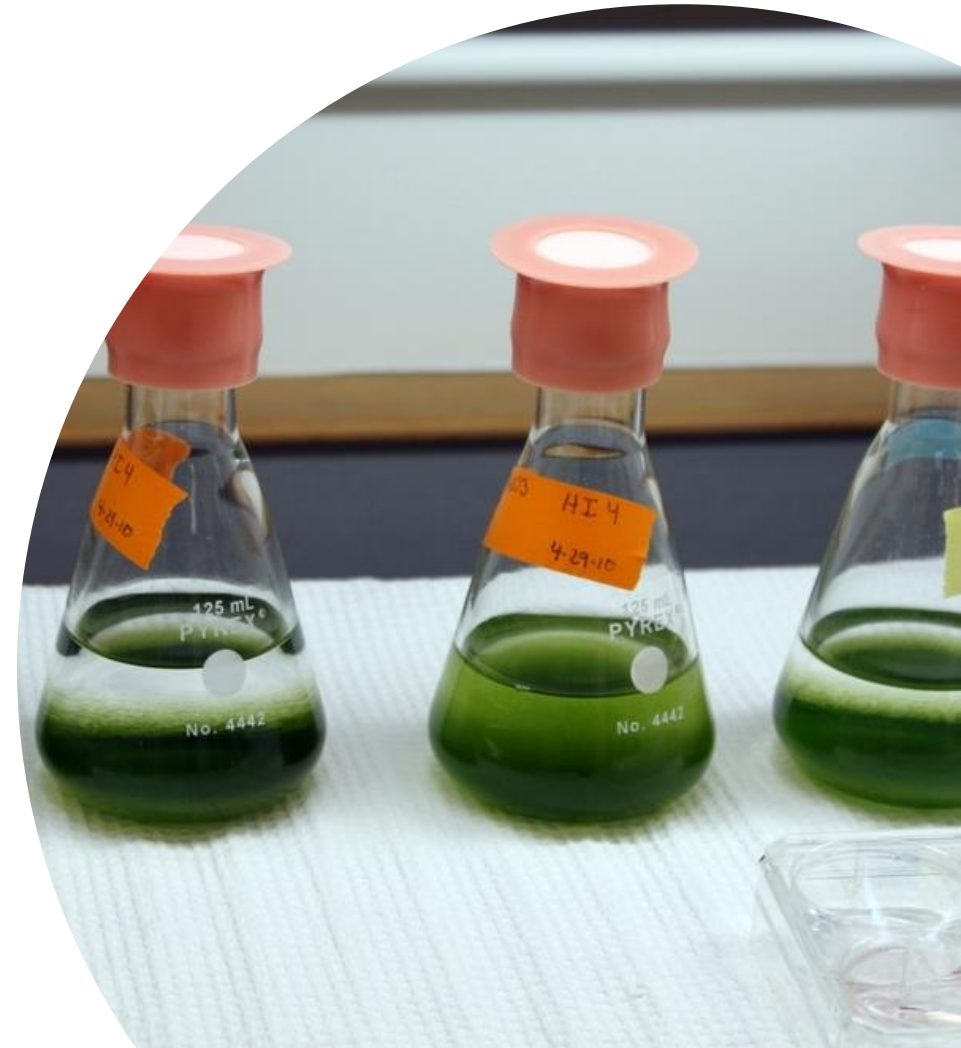


Framing Questions Transportation Sector Break-Out Session

- Do these sets of questions identify the key, broad high-level issues that should be addressed within each of the TAP sectors?
- What modifications or additions would you suggest?
- What resources (studies, experts, etc.) would you suggest the TAP consult in answering these questions?
- *Time permitting: Feel free to note particularly promising policies and actions that should be addressed.*



Transportation Sector

- What are appropriate goals for electrification, clean fuels, reduction in vehicle miles traveled (by mode and/or vehicle duty) and what are the most effective, efficient, and equitable policies and actions to achieve them?
- Key topics:
 1. Vehicle electrification
 2. Clean fuels
 3. Vehicle efficiency
 4. VMT reduction
 5. Freight transportation
 6. Decarbonizing shipping and aviation
 7. Revenue and finance
 8. Equity
- TAP sector lead: Derik Broekhoff



Transportation Sector Questions Detail

➤ Vehicle electrification

- What levels of vehicle electrification would be consistent with meeting the state's climate targets, taking into account cost and availability of vehicles and supporting infrastructure? What are the most effective policy tools and approaches for achieving these levels? Should the state set explicit EV penetration goals for different vehicle classes? What are the strengths and weaknesses of incentives vs. mandates vs. informational approaches in increasing market penetration and affordability? How should the state support expanded access to electric vehicles and charging infrastructure, including in less advantaged rural and urban communities? What should be the roles of state vs. county and local governments in promoting and developing electric vehicles and infrastructure?

➤ Clean fuels

- Are there particular fuels or technologies that should be supported for market development (e.g., hydrogen, biofuels, DAC-to-fuel technologies)? Should the state promote general market innovation and development, or expressly promote certain nascent technologies (and if so, how)?

➤ Vehicle efficiency

- What role can the state play in advancing efficiency of vehicles purchased and driven in the state? How should the private sector be motivated to contribute to achieving efficiency goals?

Transportation Sector Questions Detail

➤ Vehicle miles travelled (VMT) reductions

- What is the scope of policies and actions that should be considered in the SES, e.g., urban planning & accessibility; transit; working remotely; active transportation (walking & biking)? What are the most effective policies to encourage non-motorized options? How can the state support VMT reductions and GHG savings through local land use and housing policy? How should priorities differ for urban vs. rural areas? How much should the state focus on (and what are the options for) improved inter-urban mass transit modes (rail, bus, other)? What should be the roles of state vs. local governments in reducing GHG emissions through land use and housing policy, promoting low-carbon active transportation options, and enhancing public transit? What is the role of and opportunity for the private sector to reduce VMT independent of government action?

➤ Freight transportation

- What are viable electrification, fuels decarbonization, and VMT reduction options for freight vehicles, including long-haul and local? For urban freight transport, how much potential is there, and what are the feasible policy options for, promoting energy savings through improved logistics? How much environmental benefit and practical potential is there, and what should the policy focus be, for shifting freight transport to rail or water?

➤ Decarbonizing shipping and aviation

- What measures should actors within the state take to align these modes with the state's climate targets?

Transportation Sector Questions Detail

➤ Revenue and finance

- How can cost barriers be overcome, so that all Washingtonians, and especially low-income communities, can benefit from the shift to low-emissions fuels and technologies? How will greater adoption of electricity and other non-petroleum-fueled vehicles affect state transportation funding? What approaches can be used to fill the gaps and integrate alternative vehicles into highway and transit funding mechanisms? How can public and private finance enable low-carbon transport infrastructure to be built at the pace and scale needed?

➤ Equity

- How might considerations about accessibility, affordable mobility for urban, suburban, and rural communities, local air pollution impacts, and environmental justice inform answers to all of the above questions?

Electricity Sector

- 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 climate targets?
- Key topics:
 1. Generation resources
 2. Demand management and storage
 3. Reliability and resource adequacy
 4. Grid modernization and resilience:
 5. Regional grid integration, transmission, and siting
 6. New technologies
 7. Equity
- TAP sector lead: Marc Daudon



Electricity Sector Questions Detail

➤ Generation Resources

- What new generation (energy and capacity) resources will be needed to meet expected future demand in a low-carbon future, taking into account efficiency and electrification efforts? What barriers and constraints might limit achieving these levels and types of low-carbon resource builds and acquisitions and how can they be overcome? What are the potential roles of distributed vs. centralized resources, and new technologies?

➤ Demand management and storage

- What barriers and constraints might limit adoption of demand management and storage options and how might they be overcome?

➤ Reliability and Resource Adequacy

- How do we maintain grid reliability and resource adequacy in this transition, including, in the near term, dealing with the impending retirement of coal resources and, over the longer term, adapting to a likely ever-increasing reliance on intermittent renewable and distributed energy resources?

Electricity Sector Questions Detail

➤ 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?

➤ Regional Grid Integration, Transmission, Siting

- 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 wind in MT), thereby minimizing the total cost of the transition. How to facilitate the siting of any required new transmission facilities in a socially and environmentally responsible and just manner?

➤ New Technologies

- How to lay the groundwork for the future development and deployment of new technologies, potentially including liquid fuels produced from hydrogen and carbon capture to meet energy demand and maximize capacity factors in the electricity sector?

➤ Equity

- 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, consistent with CETA's equitable distribution requirements?

Buildings Sector

- What are the most effective, efficient, and equitable ways to decarbonize the building sector, addressing both rural and urban housing stock, rental and owned residences, and commercial and publicly-owned property?
- Key topics:
 1. Efficiency and electrification
 2. Embodied carbon
 3. Clean fuels
 4. Funding mechanisms
 5. Local governments
 6. Equity and economic opportunity
- TAP sector lead: Poppy Storm



Buildings Sector Questions Detail

➤ Efficiency and Electrification

- What levels of efficiency improvements should the state implement by 2030 (new, existing, appliances) to best set us up to meet our long-term climate goals?
- What new mandates or policies for electrification should the state adopt by 2030 to best set us up to meet our long-term climate goals?
- What are the best policy tools to support achieving these levels (codes, standards, incentives, voluntary programs, market development, investments, etc.)?
- What are their relative strengths?
- What key barriers to implementation need to be overcome?

Buildings Sector Questions Detail

➤ Energy Code and Building Performance Standards

- How can we ensure that high-leverage policies like the current and future energy codes and building performance standards drive substantial and measurable reductions in energy and GHG reductions across all sizes and vintages? What structural changes or complementary strategies are required? What new codes or changes to existing codes, and standards will be needed?

➤ Utilities

- How can we ensure that utility programs, policies, and rate structures operate most effectively to advance electrification, energy efficiency, and fuel-switching? How can utilities and utility regulation adapt to this new context that seeks to reconcile energy efficiency, demand response, and on-site renewables under a broader umbrella of deep energy efficiency, electrification, and overall grid and energy optimization?

Buildings Sector Questions Detail

➤ Embodied Carbon

- What requirements, standards, and or incentives for embodied carbon reduction should Washington state consider adopting?

➤ Clean Fuels

- What policies and actions should the state pursue to convert the fuels used for space heating, water heating, and cooking from fossil fuels to carbon-free fuels?

➤ Funding Mechanisms

- What are the opportunities for private and public sector entities to fund research, planning, policies, programs, market development, coordination, and reporting required to sustain a highly effective building decarbonization policy framework? How can tax policy, utility regulation, and incentives best be aligned to accelerate energy efficiency and the use of electricity in new and existing buildings? What are the most effective financing options for residential and commercial sectors?

Buildings Sector Questions Detail

➤ Local Governments

- How can state policies and agencies best support, complement, and align with local government building sector climate policies?

➤ Equity and Economic Opportunity

- How can building strategies, including retrofit programs, energy efficiency, and codes support high labor standards, workforce readiness goals, and efforts to improve employment conditions for Washington workers? How can programs be designed to ensure they respond to the needs of low-income communities and neighborhoods?

Industrial Sector

- How can Washington's industries transition to low-carbon production while promoting jobs and competitiveness?
- Key topics:
 1. Efficiency, electrification, and clean fuels
 2. Emissions-intensive trade-exposed (EITE) industries
 3. Innovation
 4. Funding mechanisms
 5. Utility role
 6. Jobs, equity, and economic development
 7. Regional opportunities
- TAP sector lead: Roel Hammerschlag



Industrial Sector Questions Detail

➤ Efficiency, electrification, and clean fuels

- What types of efficiency improvements and process changes (including electrification and use of clean fuels) could WA industries undertake by 2030 to best set us up to achieve our long-term climate goals? What are the best policy tools to support achieving these levels (standards, incentives, voluntary programs, investments support, etc.)? What are their relative strengths? What key barriers to implementation need to be overcome? How can competitiveness concerns be addressed?

➤ Emissions-intensive trade-exposed (EITE) industries

- What industrial sectors are accurately described as emissions intensive and subject to competition from firms without GHG emissions regulations? What specific opportunities do the cement, aluminum, steel, refinery and other EITE industries have to decarbonize their production processes while retaining or enhancing competitiveness and avoiding emissions leakage (e.g., movement of production to other states)? What mechanisms or policies might enable EITEs to transition to lower carbon processes and methods while remaining competitive?

Industrial Sector Questions Detail

➤ Innovation

- What new technologies could be deployed/what innovations are feasible in the 10-year horizon for industrial emissions to best set us up to achieve our long-term climate goals? How can state policies better synchronize with and empower market actors to innovate and build the clean energy economy as an intrinsic component of their business models? What opportunities does Washington have to host important clean energy manufacturing or R&D clusters? If those opportunities exist, which ones?

➤ Funding

- What are the opportunities for private and public sector entities to fund research, product development, and market development required to sustain a highly effective decarbonization framework in industry?

➤ Utility Role

- What role can electric utilities, gas distribution companies and transmission companies, and other energy suppliers, play in helping industry achieve decarbonization goals?

➤ Jobs and Economic Development

- How can clean energy and low-emissions initiatives increase employment and job quality in Washington state's industry? What sorts of economic or other policies, incentives, or investments support this outcome?

➤ Regional opportunities

- What efforts could the state take to work across state lines, regionally and nationally, to address competitiveness and emissions reduction in industrial operations?