# The Forests Dialogue

**ENGAGE! EXPLORE! CHANGE!**

# Bioenergy from Forests – Pacific Northwest Field Dialogue

PORTLAND, OR, AND TOPPENISH, WA, USA

## June 16-20, 2025

## Co-Chairs' Summary Report

**Dialogue Co-Chairs:** Virginia Dale (University of Tennessee); Guenevere DiGioia (South Willamette Solutions); Greg Houle (Sustainable Northwest); Phil Rigdon (Yakama Nation Dept of Natural Resources)

### EXECUTIVE SUMMARY

Bioenergy from forests (BEF), derived from burning woody residues, is both praised as a sustainable alternative to fossil fuels and criticized for its environmental and social trade-offs, prompting ongoing debate among researchers, stakeholders, and communities. To address these complexities, The Forests Dialogue (TFD) launched the Bioenergy from Forests initiative, beginning with a 2024 Scoping Dialogue that gathered diverse perspectives and laid the groundwork for a 2025 Field Dialogue in the Pacific Northwest.

TFD's Bioenergy from Forests – Pacific Northwest Field Dialogue took place in Portland, OR and Toppenish, WA on June 16-20, 2025, and was co-hosted by the Yakama Nation and Sustainable Northwest. During the Dialogue, 31 participants, including stakeholders from the Pacific Northwest, other regions of the United States, and other countries visited eight field sites and learned about the local forest management challenges and opportunities for BEF in the Pacific Northwest. In breakout discussions, participants discussed and prioritized challenges for BEF in the region across six main themes:

1. Market and economic constraints
2. Policy and regulatory barriers
3. Workforce and capacity gaps
4. Public Trust and Social License
5. Equity and Tribal inclusion
6. Project implementation challenges

Participants brainstormed opportunities focused on the importance of regulation, strong markets, and land stewardship, and developed action plans for the following prioritized opportunities:

1. Fixing the definition of woody biomass in the Renewable Fuel Standard
2. Increasing tribal authority to manage federally ceded lands
3. Stacking incentives such as carbon, payments for ecosystem services, wildlife and cultural values.

Participants emphasized that the future of bioenergy from forests hinges on policy clarity and innovation, describing how legislation can drive market growth and sustainability. Concrete actions proposed included engaging policymakers, involving Tribal voices, and fostering collaboration between nonprofits and local communities to advance the dialogue. Building on this momentum, TFD plans to host another field dialogue in the Southeastern U.S. and is exploring international forums to further develop the Bioenergy from Forests initiative.

This report was drafted/approved by the dialogue co-chairs and represents a summary of the discussions that happened over the course of the 4.5 days of the dialogue. Details of the field visits, prioritized challenges and opportunities, and dialogue next steps are described in the full Co-Chair's Summary report below.

# I. INTRODUCTION

## 1.1 About the Initiative

Bioenergy from forests is the energy generated from the combustion of woody residues, a by-product of forest harvests. Although the environmental footprint of bioenergy from forests has been the subject of substantial investigation and engagement by academic researchers, private sector stakeholders, non-governmental organizations (NGOs), and government entities, differences in opinions and perception remain about the ultimate environmental, climate, social, and economic impacts of biomass combustion. Some look to bioenergy from forests as an important co-product of and incentive for sustainable land management, with opportunities to play a role in the transition away from fossil fuels while reducing greenhouse gas emissions. While for others, efforts to promote and scale up bioenergy from forests are fraught with problems related to natural resource demands, competing sustainability priorities, and environmental justice concerns.

An open and deliberate discussion is needed on the specific advantages and disadvantages of forest biomass use, how they vary across contexts, as well as the opportunities to minimize risks and maximize benefits. To this end, The Forests Dialogue (TFD) brings together key stakeholders from diverse perspectives and experiences under the Bioenergy from Forests (BEF) initiative. In February 2024, TFD, in partnership with The Forest School at the Yale School of the Environment, co-convened the first stage of this initiative's development, a Scoping Dialogue focused on bioenergy from forests (BEF) in the United States (U.S.). During the Scoping Dialogue, stakeholders shared learnings and

experiences related to the potential for BEF as a climate mitigation strategy and related environmental, social, and economic opportunities and concerns in order to identify areas of agreement and disagreement. This single-day Scoping Dialogue set the stage for the June 2025 TFD Field Dialogue in the Pacific Northwest.

## 1.2 Background on bioenergy from forests in the Pacific Northwest

Climate and forest conditions in Oregon and Washington are determined by the Cascade Mountain range that runs from British Columbia, Canada, to Northern California. The Western facing forests or "westside forests" of the Cascades in Western Oregon and Washington have a typically mild, wet climate that supports abundant forests. The "eastside forests" are in the rain shadow of the Cascade Range. This relationship creates drier conditions with forests primarily on higher elevation slopes and along riparian areas. The Pacific Northwest has a complex mix of landownerships, including state, federal, Indigenous, and non-industrial and industrial private forests.

Landownership and federal policy have major implications on natural resource management that also affect the availability of forest and industrial residues that can be used for bioenergy. Major policies include

- **The Boldt Decision in 1974:** Reaffirmed 19th century treaty fishing rights held by some tribes in the Pacific Northwest. These rights entitled indigenous people to 50% of the harvestable fish, which went on to prevent further watershed environmental degradation. This effort led to funding for fish passage and habitat restoration.
- **The Northwest Plan, published in 1994:** Specified management practices for federally managed lands in Oregon, Washington, and northwestern California to address concerns about threatened and endangered species.

However, recent changes in United States (U.S.) Federal policies are causing uncertainties in forest protection and management strategies.

Today, most commercial timber harvests occur on the westside. However, there has been a decline in lumber production since the 1990s. Despite the decline, traditional logging and lumber production produces tons of residual woody biomass during each operation or working shift. Energy production utilizing woody biomass is a potential use for the residues.

Bioenergy has been proposed for Oregon and Washington for several decades, and many options have been considered (including production of ethanol, biochar, bio-oil, sustainable aviation fuel, hydrogen, syngas, and pellets). However, few commercial successes exist. Sourcing for bioenergy can be from forest, agricultural, or municipal residuals. Growing short rotation woody crops in the Pacific Northwest for bioenergy has been explored for several decades. Nevertheless, some local groups and NGOs are opposed to bioenergy production facilities primarily due to concerns over pollution, forest degradation, climate impacts, and threats to community health and ecosystems. At the same time, Washington State and port authorities have been actively pursuing business partnerships for BEF.

Government energy policies affect options for bioenergy. Oregon and Washington are committed to greenhouse gas reductions, but both states are hampered by the exclusion of federal forest biomass from the U.S. Renewable Fuel Standards (RFS) Program, making them ineligible for Renewable Identification Numbers (RINs). However, the U.S. Department of Energy's (DOE's) Office of Indian Energy recently extended the deadline to apply for a $25 million funding opportunity to support Tribal energy planning and development. Furthermore, international energy policies influence bioenergy in Washington State, given its ready access to marine ports and existing marine trade.

## 1.3 Dialogue Overview

TFD's Bioenergy from Forests – Pacific Northwest Field Dialogue, co-hosted by the Yakama Nation and Sustainable Northwest, was held in June 16-20, 2025. The dialogue was organized around the following goals:

- Better understand the local context regarding BEF in the Pacific Northwest. Particularly, understanding how approaches for southeastern Washington differ from those for southwestern Washington because of differences in supply (as determined by climate, tree species, growth rates, and accessibility), demand (as influenced by transportation options, markets), and workforce availability.
- Discuss fractures line and paths toward clarifying and resolving them.
- Determine a way to define and measure progress toward sustainability of bioenergy in particular contexts.

The Dialogue convened 31 participants including 12 stakeholders local to the Pacific Northwest and five international participants. Participants included individuals from academia, research institutions, the Yakama Nation, government agencies, private forest sector, local and rural communities, and environmental NGOs. Individuals came from ten different countries (including Bangladesh, Canada, Nepal, Nigeria, Pakistan, and the United Kingdom). The Dialogue included a reception hosted at the Portland Airport with a welcome by the Yakama Nation and Sustainable Northwest. The Yakama representatives discussed their contribution to the recent Portland Airport renovation, which utilized sustainably sourced wood from Yakama forestlands to produce the mass timber that lined the ceiling. This introduction framed the two days of field visits to hear directly from local stakeholders about forestry practices and challenges on the ground regarding the adoption of bioenergy markets, and two days of dialogue including plenary and small working group sessions to seek agreement on key challenges and opportunities for BEF in the Pacific Northwest.

# 2. DIALOGUE SUMMARY

## 2.1 Field visit learnings and reflections

### Longview Field Stop

The first day of the Dialogue focused on visiting the west side forests of Washington. The first stop was a view of the Port of Longview along the Columbia River. The site overlooks an industrial complex that includes a Weyerhaeuser milling and pulping facility. Members of the Chinook Nation welcomed participants to their ancestral lands around the Longview area. They discussed how the land was developed for industrial purposes. They mentioned that industries that line the river have improved when it comes to mitigating effects on air quality, although the issue remains a concern. They also discussed the lack of Federal recognition by the Chinook people and how they are currently working with a land trust to acquire more land.

**Left: Longview Stop, which overlooks a Weyerhaeuser milling and pulping facility. Right: Chinook members welcome participants at Longview**

### Forest Learning Center Field Stop

The By-Products manager from Weyerhaeuser welcomed participants at the Mount St. Helen Forest Learning Center where the group took part in a guided forest walk. Discussions centered around logging residuals, land management choices by industrial landowners, and their management prescriptions. The group walked in forests owned and managed by Weyerhaeuser since the eruption of Mount St. Helen in 1980. The representative from Weyerhaeuser explained how after the eruption they had to plant a specific genetic variation of trees, a variant which is still produced today. He also mentioned that transporting residuals is cost-intensive and a 5-hour round trip is the maximum transport time they can manage. Additionally, participants discussed how the U.S. Environmental Protection Agency (EPA) wood burning standards can be very prohibitive for bioenergy, and there are concerns with how they are implemented. Finally, there was a discussion around clear cutting versus selective harvesting, and it was mentioned by Weyerhaeuser that clear cutting is preferable for Douglas fir trees that are on a slope because it facilitates regeneration, reduces soil disturbance from uphill yarding, and allows for uniform replanting in high-productivity conifer stands.

Guided forest walk at the Forest Learning Center

## Port Blakely Field Stop

Participants then visited Port Blakely's forestlands along Winston Creek. As a privately owned, family enterprise, the Port Blakely's U.S. Operation's President facilitated the discussion around their land management practices that include a 60-year rotation, carbon credit production, and improved forest ecology. The company sells voluntary carbon credits by working under a Safe Harbor Agreement, a voluntary agreement that contributes to protection of endangered or threatened species under the Endangered Species Act (ESA). Port Blakely's president discussed how he manages habitat for wildlife in accord with regulations around the ESA regarding Spotted Owl and how his forest actually creates habitat for a wide range of wildlife. Participants visited two stands, one that was 40 years old and another one that was 60 years old. The owner explained how the younger stand is less biodiverse while the older stand allows him to participate in voluntary carbon markets, explaining that 25% more carbon is sequestered with two 60-year rotations than three 40-year rotations. He also discussed the need for different mills for different age classes, explaining that the milling infrastructure is not designed for 60-year-old trees, and that there are only 7 accessible mills in the area.

Visit to the Port Blakely plantation

It was also mentioned that the larger trees could be used in modern architectural designs, and the owner of Port Blakely is attempting to bring in architects to see the forests with the hope of convincing them to build using lumber from bigger trees. The visit also included a discussion of the need to credit biomass

sourced from federal forests in the Renewable Identification Number (RIN) under the Renewable Fuel Standard (RFS), which would provide an incentive to process residuals sourced from Federally owned lands. Finally, the owner spoke about the legacy forest debate, explaining that as forests approach 80 years old, they get close to being considered old growth, meaning that letting a stand get too old may restrict options for harvesting practices under the Northwest Plan.

### Oak Creek Field Stop

On the second day of the dialogue, the participants went to the east side of Washington State to see the drier forests. First, participants visited the Oak Creek Forest, co-managed by the Washington State Department of Fish and Wildlife Service (WDFW) and the Yakama Nation, to discuss the threat of wildfire, opportunities to salvage logs, potential markets for biomass, and environmental concerns. The representative from WDFW described how this dry forest is good for wildlife habitat. He also described the need for government subsidies to operate given the lack of mills and markets in the region. Participants also discussed how when managing this land, the Yakama Nation must abide by government regulations such as the National Environmental Policy Act (NEPA), as well as their own tribal land management rules. Participants then visited an area of the forest that was burned in a fire. As an area prone to wildfires, prescribed burns are used in this forest for fire mitigation. Additionally, tree density is important for managing the ecosystem and limiting the ability for the fire to go up into the tree canopy. In relation to biomass, it was discussed that after wildfires, the wood cannot be used for pulp but could be used for pellets.


**Left: Participants at the Oak Creek Forest. Right: Area of Oak Creek Forest affected by a fire**

### Yakama Forest Products Field Stop

For the second part of the day, participants were welcomed to the Yakama Nation Reservation. They first visited the headquarters of Yakama Forest Products, a tribal timber company near Toppenish, WA. They learned about the challenges of operating and upgrading a tribal lumber mill in today's business climate. Specifically, the mill staff described the challenges around managing and selling residuals, as well as the opportunities and barriers for the establishment of a biomass market. They also discussed personnel challenges of an aging workforce, an issue which is similar throughout the forest product supply chain. It is difficult to find younger generation people to work as loggers, drivers, and mill workers as well as

individuals who could write grants to raise funds or conduct scientific studies on the land. Furthermore, the mill staff emphasized that in order to make upgrades, they need access to loans but have difficulty getting access to long-term 20-year contracts needed to secure those loans. Finally, they discussed challenges around hauling costs involved in getting the wood to the mills.

**Left: Yakama Forest Products Headquarters. Right: Tribal members discuss operations at Yakama Forest Products**

### Simon Butte Field Stop

The Dialogue then entered the Yakama Nation's uneven aged managed forests to discuss the forest ecology, cultural differences in tribal land management, and future challenges to address small diameter and precommercial forest treatments. The tribal representatives discussed the importance of their spiritual connection with their land and how tree spacing with a more open canopy allows for the growth of understory plants that the tribe uses for food and medicine, as well as the importance of managing pests. They explained how prescribed fires can suppress fast-growing trees, mitigate wildfires, and contribute to habitat for food and medicinal plants.


**Left: Participants at the Simon Butte field stop. Right: Tree stand in the Yakama Nation Forest**

Additionally, it was mentioned that wealthy residential areas tend to have ready access to wildfire mitigation resources, sometimes at the expense of the tribe, and that there is a need to ensure that wildfire suppression resources are shared equally. Finally, the tribal representatives discussed their relationship with the Bureau of Indian Affairs (BIA). The tribe needs to have foresters and other staff on

the landscapes to support their work, but the BIA process of hiring a forester can take up to 18 months for approval, meaning that candidates for a position often end up taking other job opportunities before the BIA job comes through the system.

### Signal Peak and Yakama Mill Field Stop

The Dialogue then overlooked the Yakama Nation lands from the Signal Peak viewpoint and discussed the land management differences between Tribes, State, Private, and Federal lands, as well as how these land management options strengthen or challenge biomass energy options. The tribal members discussed how there are different opinions within the tribe around forest management and how to manage for pests. In retelling pest management stories from the 1990s where the community saw more open canopies in their forest, some folks would call up tribal forest managers complaining they were "clear cutting" despite the necessity to cut many trees to manage pests. This discourse is indicative of how the Yakama community is deeply connected to one another and truly stewards their land. At the end of day two, the participants visited the Yakama Forest Products Mill. They learned that the mill needs upgrades and is currently under capacity with the potential to produce 3 times more board feet than currently produced. There was also a discussion about tribal politics and how building a bioenergy facility is a contentious issue given the capital required. Finally, the tribal members mentioned the loss of inter-generational institutional knowledge related to forestry and reiterated that fewer people, especially among the youth, are becoming foresters given that the work is hard and dangerous whereas jobs in the casino and fishing industry are more attractive.

**Left: Participant group photo at Signal Peak with Mount Adams in the background. Right: Participants visit the Yakama Mill with a large pile of mill residues in the background**

## 2.2 Priority challenges related to Bioenergy from forests in the Pacific Northwest

The first day of discussion focused on digging deeper into stakeholder perspectives on the challenges and concerns related to BEF in the Pacific Northwest. Through breakout discussions participants discussed challenges, which were then grouped into six themes of Market and Economic Constraints, Policy and Regulatory Barriers, Workforce and Capacity Gaps, Public Trust and Social License, Equity and Tribal Inclusion, and Project Implementation Challenges.

Overall, participants emphasized economic constraints—low-value biomass and volatile markets—alongside fragmented regulations and misaligned incentives. The forestry workforce faces an aging labor force, poor youth recruitment, and technical gaps. Public trust and social license suffer from misunderstanding and urban–rural divides. Tribal stewardship struggles from limited policy support and the declining influence of Traditional Ecological Knowledge (TEK). Weak supply chains and unclear benefits valuation hamper policy implementation.

**Co-chair Phil Rigdon offers opening remarks on the first day of the discussion**

### 2.2.1 Market and economic constraints

Market and economic constraints, particularly the low value of biomass and the lack of durable markets and investment certainty are major constraints to woody biomass utilization for bioenergy. Low-value biomass, particularly small diameter trees, faces limited market demand due to high transport and handling costs, environmental regulations, and a lack of economic incentives. Despite potential societal benefits of harvesting low-value wood such as wildfire risk reduction and improvement to forest health, the material is often left in stacks on the landscape or is burned. Market uncertainty and workforce shortages further hinder sustainable forest management and biomass monetization. Communities stand to gain from bioenergy from forests, which offers local energy and fuel security, job creation, and alignment

with circular economy principles. However, translating these possibilities into tangible benefits requires durable markets, investment certainty, and supportive infrastructure. Political "will" exists, yet action and resources are lagging. Many rural or fire-prone regions suffer from underdeveloped or nonexistent infrastructure and suppressed populations without skilled workers due to limited opportunities.

Participants mentioned that bioenergy markets span multiple sectors, offering cross-cutting solutions to environmental as well as public health challenges and poor air quality impacts. Opportunities include selling underutilized woody biomass to international buyers, especially in Asia. Yet the market struggles with transportation costs, inconsistent standards, weak technology adoption, inadequate research funding, and unbalanced fossil fuel subsidies. A comprehensive analysis of the bioenergy market potential is still lacking. Optimizing biomass supply chains requires reduced transportation costs, better wood processing infrastructure, improved handling logistics, and clear pathways for small landowners to monetize residues. The current market rarely utilizes full trees due to high transport costs, few end uses, and minimal sector demand for residuals. As a result, "slash" is left on the land, which increases wildfire risk and intensity and public health impacts from wildfire smoke. To reduce wildfire risk and impact, market-driven prevention and strategies to avoid risk of wildfire must be considered as part of forest management practices. Bioenergy projects must communicate their benefits to effectively encourage financial investments that provide community economic development and wildfire disaster resilience. Financial investments need to rebuild local infrastructure and train or attract skilled workers. This work is key to revitalizing rural areas and positioning bioenergy as a viable, equitable solution to environmental and economic challenges.

### 2.2.2 Policy and regulatory barriers

Other identified challenges are policy and regulatory barriers, which include fragmented and inconsistent policy frameworks and missing or misaligned incentives. Inconsistent and fragmented policy frameworks continue to stall progress in bioenergy and sustainable forestry. Tribal management of federal lands represents a culturally rich and ecologically grounded alternative, but struggles persist due to internal misalignment on forest strategies, workforce gaps, and systemic barriers like institutional racism, unfunded mandates, and inequitable access to forestry funding. Although policies supporting tribal stewardship exist, such as the Good Neighbor Authority, broader trust and collaboration remain fragile across all governance levels.

Nationally, the policy landscape for bioenergy lacks coherent incentives. Policy discontinuity stifles investment certainty and market development. A foundational shift is needed to align community-policymaker collaboration and legislation with sustainability goals. Red tape in community stewardship, rigid forest practice rules for small landholders, and poor coordination between adjacent forest lands further compound the challenges. The underdeveloped market for woody biomass from precommercial thinning and wildfire mitigation reveals a gap in public acceptance ("social license") and market readiness.

There was general agreement among participants that existing laws must evolve to include woody biomass from Federal lands under RFS and federal policies. Tax and tariff systems should incentivize responsible forest management and biomass utilization. Additionally, wildfire mitigation funds need to support fuel removal and transport—linking environmental protection with economic opportunity. A paradigm shift from reactive wildfire suppression to proactive risk reduction requires structural reform in funding allocation. Building stronger policy coalitions, improving workforce capacity through training, and advancing community-centric approaches are key to unlocking the bioenergy sector's full potential. The future of forest resilience and energy equity depends on a holistic, aligned policy strategy that embraces local leadership, especially tribal communities, while removing barriers to innovation and inclusion.

### 2.2.3 Workforce and capacity gaps

The forestry sector is facing a critical workforce transition, with an aging labor pool, limited recruitment of young talent, and inadequate technical capacity. Knowledge held by seasoned foresters and loggers—often passed down through practical, verbal traditions—is at risk of being lost due to poor documentation and insufficient mechanisms for knowledge transfer. Workforce development is hindered by low wages, high-risk working conditions, and long hours, which make forestry jobs less appealing to younger generations. These challenges are compounded in communities affected by multi-generational poverty, addiction, and familial instability. Despite foresters and loggers being vital contributors to the Pacific Northwest's economy, their roles are undervalued, and their industry is often overlooked in discussions about green transitions. Automation in forestry further decreases job availability, while tech careers draw interest away from physical labor roles. Young people tend to lack hands-on experience in forest environments—even as many care deeply about sustainability. Misdirected environmental education and the absence of clear career pathways can leave them unaware of the impact they could make in forestry-related roles.

### 2.2.4 Public trust and social license

Participants also emphasized the issue of public trust and social license. Public acceptance of bioenergy and sustainable forestry remains hindered by widespread misunderstanding, mistrust, and a persistent urban-rural disconnect. Many communities lack exposure to current forestry practices and bioenergy technologies, leading to antiquated perceptions reinforced by insufficient public education, low civic commitment, and the legacy of NIMBY ("Not In My Backyard") resistance. Concerns about air and water quality further limit trust, despite the environmental and economic potential offered by using wood biomass for energy. The disconnect is particularly striking between urban and rural populations. Urban communities often emphasize carbon reduction and climate metrics, while rural communities prioritize safety from wildfire risk and forest health—rooted in lived experience and proximity to the land. These differing values lead to misaligned priorities and policy tensions, reducing cohesion in forest and energy planning. Effective bioenergy solutions require regional and cultural sensitivity, recognizing that one-size-fits-all approaches fall short in diverse contexts.

Early and continuous education is key to bridging gaps in understanding and rebuilding trust. Public learning efforts must be inclusive, locally grounded, and culturally respectful—engaging youth and adults across both urban and rural regions. Social learning should emphasize the interrelation of communities with their environment and the role biomass can play in circular economies and risk reduction. International regulations—especially those from the EU—sometimes impose blanket restrictions on U.S. biomass exports based on limited regional understanding. These policies, though well-intentioned, can overlook local forest conditions, sustainable practices, and Indigenous land stewardship.

### 2.2.5 Equity and Tribal inclusion

Tribal forest stewardship faces systemic challenges, including limited policy support and the declining influence of TEK. Centering forest stewardship with tribal nations can offer resilience, cultural preservation, and economic opportunity, yet integration is hampered by underfunded mandates, lack of institutional respect, and inconsistent engagement from project developers. Tribes often maintain confidentiality over their lands and cultural practices, making trust and respectful collaboration essential—particularly when managing tribal-nontribal interfaces. Natural law ecology, rooted in Indigenous tradition, emphasizes ethical risk reduction and a holistic relationship with the land. However, mainstream environmental strategies rarely acknowledge or incorporate these principles. There is a growing need to elevate TEK and create frameworks that center tribal authority and ecological wisdom. Society at large suffers from a disconnect with forests, stemming from limited exposure and inadequate curriculum on working forest benefits. Youth engagement is particularly difficult when access and education are lacking. Media-driven narratives perpetuate public distrust across sectors—from government and corporations to environmental groups and even community movements.

### 2.2.6 Project implementation challenges

Finally, participants discussed policy implementation challenges in the context of weak or absent supply chains and unclear or inconsistent benefits valuation. Successful bioenergy projects depend on a combination of robust supply chains, viable business models, adaptive technologies, and regional collaboration. However, many initiatives falter due to weak infrastructure, uncertain economics, and complex regulatory environments. Even when milling infrastructure exists nearby, projects often struggle with fragmented or absent supply networks that hinder consistent feedstock delivery. Technology adoption and operational management are central to success, yet rigid systems that can only process specific feedstocks reduce adaptability. Sustainable forest operations face regulatory and economic constraints, and landowner goals don't always align with market conditions. There is also an absence of durable offtake agreements, which is a long-term contract in which a buyer commits to purchasing a set quantity of bioenergy products at agreed prices over time, ensuring financial stability for producers and supply certainty for buyers. The absence of these agreements challenges economic viability, especially in regions with a legacy of cheap hydroelectric power.

Key hurdles include high capital requirements, cost-competitive technologies, and inconsistent infrastructure (roads, rail, waterways) near biomass sources. Pest outbreaks and extreme weather events drive biomass availability unpredictably, complicating planning. Regulatory complexity—spanning federal to local forest rules—often deters innovation and investment. Effective stakeholder engagement is frequently stymied by a lack of funding for neutral facilitators ("honest brokers") and difficulties in crafting compelling narratives that build public and political support. Valuation of climate benefits remains elusive; life cycle assessments (LCAs) vary in scope and assumptions, preventing standardization. Public misunderstanding and opposition messaging can erode social license, especially in communities where distrust or misinformation circulates. The market needs clear, context-specific strategies tailored to regional values, feedstock conditions, and community goals. Successful projects commonly feature diverse coalitions across the supply chain with conservation groups, local governments, and industry leaders working together to co-create solutions. These partnerships enable adaptive design, rooted in stakeholder values, cost-benefit clarity, and realistic expectations. One-size-fits-all approaches don't work; the ability to make use of biomass residuals depends entirely on harvesting capability, transportation options, mill demand and capacity, and local policies.

## 2.3 Opportunities and solutions to address the challenges

**Discussion of opportunities and solutions to address the challenges**

The second day of dialogue focused on exploring ways to address the challenges identified, prioritizing the proposed opportunities, and developing necessary actions to support these prioritized opportunities.

Overall, participants cited opportunities related to the importance of regulation, strong markets, and land stewardship. They supported advocacy, social media outreach, educational curricula, and improved public understanding of forest policy. They emphasized optimizing forest operations through better practices, small landowner access, and tribal stewardship on federally ceded lands. Key regulatory reforms include revising the RFS woody biomass definition to include federal lands and offering pre-emptive wildfire

mitigation incentives for resource utilization and regulatory alignment. Workforce resilience relies on paid internships, knowledge transfer, and attracting young professionals with education and stacked incentives. Securing 20-year offtake agreements provides market predictability, while streamlining permitting strengthens the business environment. Integrating wildfire risk reduction and circular-economy concepts fosters sustainable forest bioenergy markets balancing local community needs with external expertise. Success hinges on values-based design, durable supply chains, clear communication, and amplifying land-connected voices. Priority opportunities identified for Pacific Northwest forest bioenergy include revising RFS woody biomass definitions, expanding tribal authority over ceded lands, creating integrated incentives (carbon credits, ecosystem services, cultural values recognition), securing long-term contracts, promoting sector capacity-building through rural training, rewarding wildfire mitigation through avoided costs and within a circular economy context, expediting permits, aligning valuation with market opportunities, boosting financial support for small landowners, and establishing paid internships to build forestry workforce capacity (Box 1).

**BOX 1. MAIN PRIORITY OPPORTUNITIES FOR BIOENERGY FROM FORESTS IN THE PACIFIC NORTHWEST IDENTIFIED BY PARTICIPANTS**

- **Update the definition of woody biomass in the Renewable Fuel Standard (RFS) to include all underutilized wood from federal lands**
- **Increase Tribal Authority to manage federally ceded lands**
- **Stack incentives such as carbon mitigation, payment for ecosystem services, wildlife, and cultural Values**
- **Establish durable markets with repeat customer (for example, having purchase power agreement with 20-year offtake plus index pricing)**
- **Promote sector level solutions versus individual enterprises such as having technological training in rural areas**
- **Avoid cost shift: for example, reduce wildfire risk and promote payment for ecosystem services tied to the concept of circular economy**
- **Streamline permitting**
- **Align value with permitting structures and existing markets**
- **Increase assistance to communities and small landowners to help with planning, monetizing, and using resources appropriately**
- **Support biomass and carbon markets that consider biomass as renewable**
- **Align wildfire risk reduction with commercial value needs in permitting structures and existing markets**
- **Establish internship programs for youth to transfer knowledge from ageing workforce and pay the youth for their internship work**

Participants discussed how the dialogue lacked input from key stakeholders vital to inclusive bioenergy and forest management. Participants stressed that bioenergy's future is uncertain, hinging on policy direction. Examples from Europe, Japan, and Eastern U.S. show how legislation drives growth. It was mentioned that circular approaches and real-time insights are essential for sustainable sector development.

## CONCLUSIONS AND NEXT STEPS IN THE PACIFIC NORTHWEST AND GLOBALLY

**Dialogue participants during a plenary session**

At the end of the Dialogue, participants were invited to mention one concrete step they intend to take to advance this dialogue. Ideas mentioned included reporting to the personal board of their nonprofit about lessons learned from the dialogue, summarizing what was learnt in bullet points and sharing on social media, engaging regulators and inviting policymakers to refine definitions from a regulation standpoint, inviting Tribal stakeholders to participate as speakers in international conferences, and Sustainable Northwest and the Yakama Nation working together on workforce capacity. Participants agreed that this was a very useful process and urged TFD to continue to convene the discussions.

Regarding next steps for TFD and the BEF Initiative, TFD is committed to convening another field dialogue in Southeastern US within the next year.  TFD is working to identify a co-host for that dialogue and will begin planning in earnest very soon.  The learnings from this Dialogue were presented on June 25th, 2025 at the Sustainable Biomass Program Forum in Atlanta, Georgia. In partnership with the Sustainable Biomass Program (SBP), TFD is also exploring the possibility of holding internationally focused dialogues on this issue.

# A. APPENDIX

## Participant List

The following individuals participated in the Dialogue:

| Name | Organization |
|---|---|
| Abbey Brown | Washington Department of Ecology |
| Kyla Cheynet | Drax, Inc. |
| Virginia Dale | University of Tennessee |
| Guenevere DiGioia | South Willamette Solutions |
| Jane Dowd | The Forests Dialogue |
| Gary Dunning | The Forests Dialogue |
| Meghan Gavin | Carbon Containment Lab |
| Greg Houle | Sustainable Northwest |
| Muhammad Usman Khan | Washington State University |
| Naresh Khanal | IFSA Oregon State University |
| Keith Kline | Oak Ridge National Laboratory |
| Jeremy Kwok Choon | Sustainable Northwest |
| Chenlin Li | U.S. Department of Energy |
| J.D. Mann | Yakama Forest Products |
| Will Martin | American Forest Foundation |
| Farhad Masum | Argonne National Laboratory |
| Ian Moore | Spatial Informatics Group |
| Calvin Mukumoto | Mukumoto Associates, LLC. |
| Christopher O'Brien | Sustainable Biomass Program |
| Elaine Oneil | CORRIM Company |
| Josh Proudfoot | Parametrix |
| Mark Puglas | Drax, Inc. |
| Nasir Qadir | IFSA LC FGSA: International Forestry Students' Association Local Committee Forestry and Natural Resource Students Association |
| Barbara Reck | Yale School of the Environment |
| Phil Rigdon | Yakama Nation Department of Natural Resources |
| Steve Rigdon | Sustainable Northwest |
| Olakunle Sodiya | North Carolina State University |
| Shannon Souza | Sol Coast Consulting & Design, LLC. |
| Skip Sponsel | The Devonshire Group, LLC. |
| David Tenny | National Alliance of Forest Owners |
| Thibault Vermeulen | The Forests Dialogue |

## B. AGENDA

### Monday, June 16 – Dialogue Introduction and Dinner

*Loyal Legions Restaurant, Mezzanine, Portland Airport*

6:30 PM **Registration**

7:00 PM **Reception Dinner and Presentations**
- Introductions, ground rules, and expectations
- Background Paper and field visit overview

9:00 PM **Adjourn**

### Tuesday, June 17 – Field Visits Day 1

7:45 AM **Meet in Lobby of Radisson Hotel Portland Airport**

8:00 AM **Depart for Field Visits**

9:15 AM **Port of Longview Stop**
- Chinook Nation Welcome
- Discussion: State infrastructure and biomass processing

11:00 AM **Forest Learning Center Stop**
- Forest Walk
- Discussion: Commercial forestry and residuals management

12:30 PM **Lunch**

3:00 PM **Winston Creek Stop**
- Port Blakely Introduction
- Discussion: Logger rotations, forest ecology and large log infrastructure

5:30 PM **Arrive at Packwood**
- Check into hotels

6:15 PM **Leave for Dinner**
- Longmire Springs Brewery

8:00 PM **Back to hotels**

## Wednesday, June 18 – Field Visits Day 2

7:00 AM **Depart Hotels**

8:45 AM **Roadside Stop**
- Discussion: Wildfire

9:45 AM **Oak Creek Stop**
- Discussion: Wildfire threats and opportunities for salvage

**12:15** **Yakama Forest Products Stop**
- Discussion: Tribal mills and managing residuals

12:45 PM **Lunch**

1:30 PM Leave for Yakama Forests

2:30 PM **Simon Butte Stop**
- Discussion: uneven aged management, culture, and challenges

3:30 PM **Signal Peak Stop**
- Discussion: management differences on tribal, state, private and federal land

5:00 PM Arrive at Legions Casino Hotel

## Thursday, June 19 –Dialogue Day 1

*Columbia River Meeting Room, Legends Casino Hotel, Toppenish, WA*

8:30 AM **Participant Registration**

9:00 AM **Plenary: Opening Session**
- Welcome, Introductions, Overview

9:30 AM **Plenary: Field Visit Learnings and Reflections**

10:15 AM **Plenary: Stakeholder perspectives on Bioenergy from Forests**

11:00 AM **Break**

11:15 AM **Plenary: Vision for the future of bioenergy from forests in the Pacific Northwest**

12:30 PM **Lunch**

1:30 PM **Breakout Groups: Key Challenges to the vision**

3:30 PM **Break**

3:45 PM **Plenary: Breakout Groups Report Back**

4:30 PM **Plenary: Wrap up**

5:00 PM **Adjourn**

6:30 PM **Group Dinner hosted by the Yakama Nation**

## Friday, June 20 – Dialogue Day 2

*Columbia River Meeting Room, Legends Casino Hotel, Toppenish, WA*

8:30 AM **Plenary: Day 3 Recap on Challenges**

9:00 AM **Breakout Groups: Ideas and options to address the challenges**

10:45 AM **Break**

11:00 AM **Plenary: Breakout Groups Report Back**

12:00 PM **Lunch**

1:00 PM **Plenary: Prioritization of solutions and next steps**

2:30 PM **Plenary: Wrap Up**

3:00 PM **Adjourn**

3:30 PM **Transport back to Portland Airport**