Jumpstarting Industrial Symbiosis in the Columbia Corridor

Impact Report for the Community Energy Innovation Prize

The PDX Clean Industry Network

November 15, 2024

Team Members

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Short Description

The PDX Clean Industry Network team is composed of local business associations, public agencies, universities, workforce organizations, and technical experts unified by the pursuit of a just transition for Portland's industrial sector. The Community Energy Innovation Prize allowed our group to create an enabling environment for industrial symbiosis in Portland's Columbia Corridor. Industrial symbiosis (IS) reduces pollution and waste through symbiotic exchanges of materials and energy between manufacturers. The Columbia Corridor is Oregon's largest economic corridor that concentrates most of Portland's industrial sector, providing more middle wage jobs for Portland's BIPOC residents than any other sector, and it sits adjacent to vulnerable neighborhoods and natural ecosystems.

Work for the Community Energy Innovation Prize (CEIP) included two primary activities: 1) social infrastructure development to foster collaboration and shared responsibility, and 2) technical infrastructure development to support an IS network in this region. Our work towards these two activities is summarized in Table A. In addition to these direct impacts, the CEIP has provided funding and focus for collaborators from the private sector, government, community, and universities to build relationships in service of the region's larger goals of reducing industrial

emissions and a just transition. The opportunity also resulted in the formation of an industry-led Clean Industry Hub, a $350,000 grant from the EPA, an anticipated $25 million from the Portland Clean Energy Fund, and motivated the pursuit of state legislation to enable IS.

With the Grand Prize award, we would pursue our near-term goals of further engagement with disadvantaged communities to develop a collaborative vision for Portland's industrial sector, continued outreach to smaller and BIPOC owned businesses, and targeted work with businesses to move toward model IS projects.

Table A: Summary of project activities and outcomes.

Phase	**Activity**	**Outcome**
PROGRESS Phase	Direct outreach to manufacturers	38 businesses engaged
	Industry convenings	35 businesses engaged with two convenings
	Public sector convening	16 public agencies and utilities attended
	Student involvement	Three students played key roles in different aspects of the project
IMPACT Phase	Workforce convening	29 businesses attended
	Community workshop	8 community-based organizations attended
	Final convening	40 businesses attended
	Technical assessments	6 assessments of manufacturing facilities to identify industrial symbiosis opportunities
	Disseminate lessons learned & recommendations	4 presentations about lessons learned to different regional and international groups

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1. Introduction

The City of Portland's strategic focus on clean industry has evolved since its launch in 2020, shifting from a regulatory approach to a more collaborative and inclusive effort over the past four years. In 2022, the City published a study that outlined priority actions and established a partnership with Portland State University and Prosper Portland called the Clean Industry Initiative (CII).The CII embarked on a period of learning and trust building, including knowledge exchanges with Denmark to learn about their clean industry model, and development of a roadmap for addressing industrial emissions that emphasized collaboration. One promising strategy that emerged from the Danish partnership was the concept of Industrial Symbiosis.

Industrial Symbiosis (IS) is a practice that reduces pollution and waste through symbiotic exchanges of materials and energy between manufacturers. IS supports energy efficiency and organizational resilience while providing a positive framework for government, business, and community to work together. Members of the CII recognized the potential for IS in the Columbia Corridor, Oregon's largest economic corridor that concentrates most of Portland's industrial sector. The Columbia Corridor borders vulnerable neighborhoods and ecosystems and provides more middle wage jobs for Portland's BIPOC residents than any other sector.[1] The Corridor and surrounding neighborhoods are designated disadvantaged in the Climate and Economic Justice Screening Tool (CEJST).

Danish experts emphasized that the key to successful IS is relationship and trust building. Our work for this Prize has focused on two major components: 1) social infrastructure development to foster collaboration and shared responsibility, and 2) technical infrastructure development to support an IS network in this region. The nascent IS ecosystem that we've created is grounded in the principles of a just transition and centers community voices while also leading to long-term reductions in industrial emissions, pollution, and waste.

This Impact Report is the concluding report in our work for the Clean Energy Innovation Prize. Each section addresses a Criterion identified in the Official Rules.

[1] Portland Income Inequality and Racial Equity Trends, 2022

2. Program Activities (Criterion 3)

2.1 Summary of Activities Enabled by Prize Awards

In the PROGRESS Phase, the Columbia Corridor Association conducted outreach to 38 businesses and hosted two industry convenings, with each event drawing over 20 businesses to explore IS opportunities. A public sector convening included 27 representatives from 16 public agencies and utilities to discuss regulatory barriers and benefits for frontline communities. PSU hired a graduate student to outline next steps for IS implementation in Portland and OSU engaged two engineering students to support technical assessments in the IMPACT Phase.

Before work for the Prize began, OMIC R&D experienced staffing and leadership changes which reduced their capacity to participate, so they are no longer a team member on this project.

IMPACT Phase activities, in line with the initial goals from the Impact Plan and Progress Report, are summarized in Table 1.

Table 1: Summary of IMPACT Phase activities and team involvement.
Team members: Worksystems, Columbia Corridor Association (CCA), Oregon State University's Industrial Assessment Center, Energy 350, Center for Sustainable Infrastructure (CSI), City of Portland Bureau of Planning & Sustainability (BPS), Prosper Portland, and Portland State University Institute for Sustainable Solutions (PSU ISS).

Goal:	**Goal Evaluation:**	**Results after IMPACT Phase:**
Goal 5: Between July and August, host a convening of 15+ businesses to bring Worksystems career coaches and other workforce experts to identify workforce and training needs for both standard business operations and symbiotic business activities.	Convening attendance will be tracked for participant information and a post-convening survey will be disseminated to assess outcomes. Lessons learned allow Worksystems to develop relevant workforce coaching materials and guide their strategic plans.	To reach more workforce experts, we added IS as a topic to an existing event series about workforce development in clean energy. The event took place in October, and had 34 attendees representing 29 different businesses. CCA presented IS and led a breakout session to discuss IS specifically. We did not distribute a post-event survey due to low survey responsiveness at other convenings. Findings from this convening will inform Worksystems' clean energy sector workforce strategy. Completed by: **Worksystems and CCA**
Goal 6: Between July and November 2024, the OSU IAC, Energy 350, and CSI will support 3-4 businesses to conduct technical assessments. Selected businesses will be either BIPOC-owned or will have significant disadvantaged population employees.	3-4 waste assessments have been conducted and potential points of symbiosis have been noted and businesses are informed on these points. Potential collaboration between businesses has been supported with networking efforts.	In August, the OSU IAC and Energy 350 developed an IS protocol to add to technical assessments. By October, they completed six assessments and all had output streams that could be applied to symbiosis. Due to a limited pool of interested businesses for the technical assessments, we were not able to select only BIPOC-owned or majority-BIPOC businesses. Completed by: **OSU IAC and Energy 350**
Goal 7: Between August and November 2024, develop and disseminate	Attendance to information sharing events is tracked along	In November, CSI created IS-focused educational events which they presented at the G-20 Summit and Green Rio conference. They also presented on IS to Oregon elected officials at the League of Oregon Cities and the Pacific

workforce findings, lessons learned, policy barriers and incentives, and recommendations for scaling to inform regional policies and programs. We expect this will involve a presentation at the 2024 international G20 summit panel.	with other poignant information.	Northwest Clean Water Association. Completed by: **CSI**
Goal 8 (added after PROGRESS Phase): Host one additional convening of manufacturing businesses that is focused on building the social infrastructure needed for symbiosis, emphasizing one-on-one interactions.	Convening attendance will be tracked for participant information and a post-convening survey will be disseminated to assess outcomes.	In October, CCA planned and hosted a final manufacturing-focused convening, attended by roughly 50 representatives from 40 different businesses, agencies or other organizations. Rather than focus on one-on-one connections, CCA provided the opportunity for five different manufacturers to pitch their ideas for IS projects in the hope of garnering interested partners in the audience. Completed by: **CCA and Prosper Portland**
Goal 9 (added after PROGRESS Phase): Host a focus group of key community-based organizations that represent relevant local stakeholders to symbiosis in the Columbia Corridor.	Convening attendance will be tracked for participant information and a post-convening survey will be disseminated to assess outcomes.	In October, BPS and PSU ISS planned a workshop attended by 14 representatives from eight different community-based or other organizations. In the post-event survey, 11 out of 12 respondents said they understand IS well and 9 out of 12 respondents said they want to stay involved in this work. Completed by: **BPS and PSU ISS**

2.2 Project Impact Summary

The CEIP has supported tangible steps towards the just transition and a clean industry-driven economy in the Portland region. By engaging the CII and other local initiatives at the nexus of clean energy and social justice, this work activated strategies in the Portland Clean Industry Study, which identified priority areas for a green industrial sector, and the Advance Portland five-year economic development strategy, which lays out steps towards making Portland an inclusive, prosperous, and future-ready city.

This project has built the two key components undergirding an IS network, social infrastructure and technical infrastructure:

Social Infrastructure. In the PROGRESS Phase, we engaged 59 businesses and 16 public agencies through direct outreach or as attendees of three convenings. In the IMPACT Phase, we engaged over 40 businesses, agencies, community-based organizations (CBOs), or other organizations as attendees of three convenings.

The momentum generated by this work has galvanized other collaborators, resulting in a swath of new coalitions, partnerships, funding opportunities, and statewide expansion which are detailed in Table 2.

Technical Infrastructure. Assessments conducted by our team prepared six businesses to begin investigating IS with other companies who have completed assessments. All have possible waste or output streams that could be applied to symbiosis. For example, one assessment at a large electronics manufacturer identified opportunities for resource sharing around landfill diversion and heat recovery. This project also provided an opportunity to educate the next generation of industrial experts, with students from OSU's Industrial Assessment Center leading the development of a new IS assessment protocol. Our technical assessment partners are now expanding their assessments to include this new IS protocol.

2.3 Key Takeaways from Peer Exchanges

Our team attended the CEIP Peer Exchanges throughout the duration of both phases. These exchanges helped us improve our work by:

- **Increasing the scope of our work to include a greater community and equity component**. As a result, we engaged disadvantaged communities with a community-focused workshop, and adjusted the structure of the public sector convening to focus on equity. We also included community engagement strategies and an equity analysis in our public project report.

- **Leveraging our work to seek funding beyond the prize period.** Relationships formed during the CEIP allowed collaborators to win an EPA Pollution Prevention grant that relies on the University-Community-Industry-Government approach to pollution prevention from industrial sources. We also submitted a grant for $25 million to fund industry decarbonization projects identified through this work (this grant is pending).
- **Adjusting our approach and expectations to engaging the workforce and their supportive organizations**. Future workforce development initiatives may benefit from providing on-site tours of local examples of innovation in clean energy which have high potential for IS applications in metals manufacturing, such as district heating.

3. Stakeholders, Resources, and Activities to Develop a Domestic Manufacturing Innovation Ecosystem (Criterion 2)

3.1 Stakeholders, Resources, and Activities

Successful IS implementation depends on the exchange of materials between businesses, which itself relies on shared information, infrastructure, utilities, and services. Following best practices developed in Denmark, we learned that trust among enabling and impacted parties and a technical understanding of opportunities and solutions are the two essential components to implementing these projects. Our collaborations and activities were guided by this approach.

Figure 1 shows Portland's ecosystem of social and technical infrastructure that makes up our local IS network. The outermost circle represents the literature and subject matter expertise that informs our understanding of IS. The second circle represents the key groups that we have engaged in our work for this Prize and related clean industry efforts. The third circle represents cross-sector coalitions that have formed through this work; there is significant overlap with members of each coalition, creating synergy as well as long-term sustainability. The innermost circle represents the future projects that will come out of the larger ecosystem.

Table 2 specifies the major connections, Prize activities, and next steps that support the advancement of a community-based clean energy transition in our region.

Figure 1: Ecosystem of stakeholders and resources in the pursuit of an IS ecosystem in the Columbia Corridor.

Table 2: Major partnerships, activities, and next steps in the advancement of an IS ecosystem.

Stakeholder group:	Key connections made and activities supported by this prize:	Next steps in implementing a clean industry network:
Local Cross-Sector Clean Industry Coalitions	**The PDX Clean Industry Network** enables IS through the CEIP. Collaborators each made unique contributions and connected with other sectors through planning and attending convenings.	Continue leveraging this Prize to garner future funding to support these coalitions in their pursuit of a shared clean industry vision through critical decarbonization and pollution prevention projects. Outside of project work, continue convening these coalitions quarterly to identify priority projects and collaborate on funding opportunities. These groups are also seeking operational funding to support vision alignment and relationship building.
	The Clean Industry Initiative (CII) is the larger group behind the PDX Clean Industry Network, a partnership between the Portland Bureau of Planning & Sustainability, Portland State University, and Prosper Portland to advance clean industry strategy. The CII successfully leveraged this Prize with the receipt of a $350,000 EPA grant for pollution prevention in the Columbia Corridor. This grant funds Prize collaborators to continue this cross-sector work.	
	Portland Metro Chamber Clean Industry Hub, a coalition formed from our Clean Industry Network and the CII, is led by the private sector and overseen by an advisory group of industrial businesses, public agencies, nonprofit organizations, and academia. During the Prize period, the Hub made a public commitment to industrial decarbonization and joined forces with the PDX Clean Industry Network. The Hub is anticipating a City grant for $25 million and is now set up to pursue other funding opportunities.	
Public Sector Partners	Various **State Legislators** were engaged during this Prize, including a state representative who sought our feedback on a draft policy to promote IS in Oregon, another representative who attended a convening, and a presentation from Center for Sustainable Infrastructure (CSI) to an audience of Oregon elected officials.	Form a public sector working group around IS to enable these projects at the local and state levels. Provide IS best practices and expertise to policy makers. Help policy makers identify strategic public investments or changes to policy that could enable an IS model project.
	Wastewater reuse is a high opportunity area for public sector involvement in IS. The **Portland Bureau of Environmental Services** and **Vancouver Wastewater Treatment** presented at our convenings about existing and potential wastewater reuse projects. CSI also presented about IS and wastewater reuse to the **Pacific Northwest Clean Water Association**.	

	Other public sector agencies engaged in this project include **Portland Water Bureau, Port of Portland, Oregon Metro, and Prosper Portland** who attended several convenings and were engaged in 1-1 meetings**.**	Create connections between policy makers, the private sector and community to further political support for IS.
Private Sector Partners	We have broadly promoted the IS concept to private sector partners in the Columbia Corridor and have helped build relationships between these businesses. We have identified two dozen manufacturers with potential IS projects and provided the opportunity for them to share ideas with potential partners at our convenings. For example: **Boardman Foods** and **Pacific Seafood & Pacific Bio Products** are exploring water reuse and anaerobic digestion in collaboration with other manufacturers in the region. **Peak Landscape** has expressed interest in using wastewater from a local food manufacturer. The **Portland Water Bureau** is now discussing use of shallow groundwater as a geothermal system. **Bullseye Glass** is considering sourcing sand from silicon wafer manufacturing. **City of Roses Disposal & Recycling** is pursuing plans for a large waste innovation accelerator that would co-locate symbiosis partners. We have also engaged **Energy 350**, a private sector industrial energy consultant that has extensive connections to manufacturers who want to increase energy efficiency, and they have added an IS protocol to their assessments.	Continue networking with manufacturers to identify businesses interested in IS. Use coalition resources to support businesses in securing federal funding for IS projects. Columbia Corridor Association will continue to act as a trusted connector for businesses interested in working together on an IS project. Energy 350 can continue to incorporate IS in their energy efficiency assessments, and identify opportunities for clients to work together on IS.
Community Partners	**Neighbors for Clean Air (NCA), Verde, Coalition of Communities of Color, Trash for Peace, Historic Parkrose, Native American Youth and Family Center, and Oregon Tradeswomen** are local CBOs with connections to the disadvantaged communities in and around the Columbia Corridor. We engaged these organizations during the community engagement process and provided a pathway for their involvement in future industry projects. We also collaborated with existing community-based initiatives: - The **East Portland TIF District** which has been engaging in a visioning process with the East Columbia Corridor and adjacent	Representatives from each of these organizations expressed interest in being involved in our work in the future, and suggested a community visioning process to socialize the idea of IS and understand community priorities. BPS and the Coalition of Communities of Color are participating in a pilot project to use community data for

	neighborhoods. - **Worksystems Clean Energy Program** which focuses on increasing the clean energy workforce with an emphasis on employing workers from disadvantaged communities.	environmental justice decisionmaking in the industrial sector.
Universities	**Portland State University's (PSU) Institute For Sustainable Solutions (ISS)** specializes in facilitating translational research by managing partnerships and bringing the skills and expertise of PSU faculty and students to projects in the region. ISS managed the project work, supported collaboration and supervised a graduate student who wrote a report with recommendations for pursuing IS in Portland. ISS also led the application for the recently awarded EPA Pollution Prevention grant. Students and faculty at the **Oregon State University Industrial Assessment Center** connected with industrial businesses outside of our geographic area and conducted five technical assessments.	ISS has connected the Clean Industry Hub's PCEF grant application to environmental economists at PSU, and is proposing a student workshop project to draft initial plans for a green industrial campus in the Columbia Corridor. As part of the CII, ISS will continue to support collaborative projects and funding opportunities and develop and deploy University expertise for future IS work.
International Partners	**International Industrial Symbiosis Alliance (IISA)** is a working group dedicated to international IS adoption. Our participation has informed our local work towards IS and connected us with new international partners. CSI helped establish this partnership with monthly meetings throughout 2024, a formal agreement to promote advancement of IS across various countries, and IS-focused educational events at the G-20 summit in Rio.	CSI is bringing two IS experts from Denmark to Oregon in early 2025 to help with resource mapping across the state, which is a crucial step towards IS implementation in Oregon.
	GreenLab, Kalundborg Symbiosis, and AEDIN are successful symbiotic networks in Denmark and Brazil. Representatives from all three of these symbiotic networks presented at our industry convenings, sharing advice and lessons learned, and we will continue soliciting their advice as our work continues.	

3.2 Barriers and Challenges to Building Connections with Manufacturers

Throughout the project, we encountered a gap in trust between the public and private sectors, but found that intentional relationship-building helped to bridge that gap. We relied on "trusted messengers" to alleviate concerns and demonstrate collaboration between industry, government, and CBOs.

Possibly the biggest challenge was limitations in time and resources. Small businesses often have limited capacity for activities outside their core mission. Though convening attendance was high, we had many people register but not attend. Direct outreach is the most effective way to engage businesses in this work, but it requires extensive time and resources. It often requires a concrete project to get these stakeholders at the table, so building an IS network will require a balance between building trust and successful project implementation.

In building technical infrastructure, we were limited by time and capacity to conduct many assessments. We conducted six assessments and identified several preliminary symbiotic opportunities, but growing a full IS network will require more assessments and a confidential, central place to store data.

4. Engagement & Partnerships with Disadvantaged Communities (Criterion 1)

4.1 Summary of Engagement with Disadvantaged Communities

Throughout both project phases, we engaged a variety of manufacturing businesses and organizations, community members, and other relevant stakeholders, but in the IMPACT Phase, we prioritized community engagement to assess the needs and equity impacts on disadvantaged communities near Portland's Columbia Corridor. We engaged environmental justice organizations to help design an effective community engagement strategy. The community workshop in October identified community priorities around industry and generated ideas for how IS can benefit disadvantaged communities. Results and recommendations are summarized in Table 3.

4.2 Community Engagement Methods

Community engagement empowers disadvantaged communities to influence the decisions that affect their lives, creating more inclusive, just, and responsive outcomes. We met with key partners, hosted a community-focused workshop with representative CBOs, and partnered with our workforce collaborator, Worksystems, to introduce IS into their Clean Energy programs that prioritize employment for underserved and frontline communities.

Prior to the community workshop, we met with Neighbors for Clean Air (NCA) and Verde, local non-profits focused on environmental justice in neighborhoods around the Columbia Corridor, as well as Prosper Portland staff that have established community relationships. These meetings gave us a sense of community priorities and insight on facilitating a productive conversation.

The community workshop in October 2024 brought 14 participants representing eight different organizations including CBOs, public agencies, and labor organizations. The goals of this workshop were:

- Establish a shared understanding of clean industry in Portland,
- Build awareness of IS approach to industry,
- Identify community benefits of clean industry and project examples, and
- Foster open dialogue about the impacts of industry in Portland.

The workshop's results are summarized in Table 1.

Workforce development is a key aspect in how IS could benefit or harm disadvantaged communities in Portland, many of which have high employment by the Columbia Corridor.[2] To investigate these impacts, our team presented at a

[2] Portland Income Inequality and Racial Equity Trends, 2022

Worksystems clean energy panel about IS and led a breakout session, where we discussed workforce and training needs for IS.

Community engagement efforts were supported with research by Laura Fleming, the team's graduate student, whose research, included above and summarized below, includes recommendations for:

- Best practices in the community engagement process
- Institutionalizing equity and community engagement in future work
- Other means to advance equity in IS implementation through policy and regulation.

4.3 Project Impact on Disadvantaged Communities & Recommendations

The CEIP enabled us to work directly with CBOs active in the Columbia Corridor, most of whom are interested in partnering on future projects. All community partners we engaged with asked to be kept up-to-date and are interested in attending future engagement events, including one organization with whom we have already partnered on two funding applications. Many community partners were interested in continuing to develop a shared community vision for industrial decarbonization in Portland centering EJ communities.

Table 3 summarizes the results of our community engagement work for this Prize, which allowed us to determine community priorities, identify action items, and develop future recommendations for a just transition to clean industry.

Table 3: Needs and impacts on disadvantaged communities, and recommendations for meeting community needs long-term.

Community need identified:	**How this project helped to meet this community need:**	**Recommendations for meeting community needs in future work:**
Alleviate local environmental impacts and improve climate resilience.	IS is a clean industry model with high potential for decreased environmental impacts. This project jumpstarted IS in Portland through building social infrastructure and meeting initial technical needs.	Prioritize IS projects that reduce localized environmental impacts and build climate resilience. Ensure IS projects bring positive community benefits through Community Benefits Agreements (CBAs).
Ongoing and regular **community engagement** around Portland's industrial sector.	We carried out initial community engagement around IS in Portland with small-group meetings with partners, a larger workshop with community stakeholders, and a convening focused on workforce needs.	Conduct early, ongoing, and regular community engagement, beginning with an extensive collaborative visioning process that empowers disadvantaged communities impacted by the industrial sector.
Institutionalized dedication to equity in the industrial sector.	Using the graduate student's research and feedback from the community workshop, we made key recommendations about how to institutionalize equity and community engagement in clean industry projects.	Ensure a dedicated community partner is a compensated member of any project teams in the future. Carry out case-by-case equity analyses and community engagement for new projects.
Improved communication about industrial impacts that can improve community trust of the industry sector. Many communities have strong negative reactions to nearby industry.	This project informed community partners about this work and gathered feedback. We identified effective messaging for IS, which will be used for future engagement. Attendees particularly appreciated the emphasis on shifting from extraction to circularity.	Use messaging from this project in future community engagement. Determine ways that industry could contribute to local culture or provide third spaces. For example, a manufacturer could provide art and educational material related to their products to display at community centers or parks.

Long-term, equitable distribution of public funds to disadvantaged communities.	Through community engagement, we received feedback that lack of funding is a barrier for IS projects, but particularly for projects in disadvantaged communities. We applied for funding to create a program that carves out 20 percent of funds for small and disadvantaged businesses.	Continue leveraging Prize funding for projects that will benefit disadvantaged communities through mechanisms such as long-term commitments for BIPOC-owned or majority-BIPOC businesses. Conduct targeted outreach to ensure these businesses are aware of funding opportunities and provide technical assistance.
IS projects have the potential to increase jobs for marginalized communities.This requires providing **training and employment opportunities** across all skill levels.	At our workforce convening, we received feedback about overall training needs for IS implementation. Once specific projects are identified, we can re-engage these connections about specific training needs. The graduate student's research also provided recommendations for workforce development.	Provide funding to support training and workforce development in the clean industry transition. Define career ladders and clear pathways for employees to advance. Set local goals to hire a certain percentage of employees from the local community, especially from underrepresented or disadvantaged groups.

4.4 Major Challenges in Engagement with Disadvantaged Communities

The PDX Clean Industry Network is a strong team representing many different sectors, but it does not have an environmental justice representative. We responded to this challenge by engaging with an existing partner, Neighbors for Clean Air. Their feedback guided us through a successful community engagement process. NCA is now increasingly engaged in the CII as a partner and co-applicant for other projects.

Our international partners in Denmark provided crucial recommendations for the pursuit of IS, but their recommendations are not adapted to U.S. regulatory frameworks or the unique environmental justice considerations in our region. We developed our own approach that was appropriate for our local context and integrated equity into our pursuit of IS. Our team is now able to provide advice for other potential symbiotic networks to engage disadvantaged communities in their work.

We set a goal to prioritize technical assessments for BIPOC-owned or majority BIPOC manufacturers. However, even though we connected with over 50 businesses, we did not receive enough requests for assessments to prioritize BIPOC-owned or majority-BIPOC manufacturers. In our future work, we plan to conduct targeted outreach to manufacturers that employ disadvantaged communities.

5. Long-Term Energy Transition in the Columbia Corridor: Vision, Goals, and Work Plan (Criterion 4)

5.1 Vision for the Long-Term Energy Transition in the Columbia Corridor

Our vision for the Columbia Corridor is a just transition for Portland's industrial sector, undergirded by community decisionmaking and public-private partnerships.

Just transition. The long term vision for this work is a just transition for Portland's industrial sector. Just transition is a values-based framework for our economy that centers communities most impacted by the climate crisis, and on a broader scale, shifts the economy from extraction to regeneration and circularity. Our community of interest, the Columbia Corridor, is the region's largest industrial district, with 75,000 industrial employees, and is located adjacent to some of the region's most disadvantaged neighborhoods. Deliberate, equitable investments in IS could bring significant benefits to the disadvantaged communities in the Columbia Corridor.

Our work for the CEIP advanced a just transition through a multifaceted approach of projects, tangible community benefits, collaboration structures, policy, workforce development, and technological innovation.

Public-private partnerships. A key takeaway from our exchange with Denmark was that a successful IS network must bridge the private and public sectors. We have engaged the business community as well as numerous policymakers, regulatory bodies, and elected officials in this work to begin exploring future partnerships.

5.2 Near-term Goals and Plan for Ongoing Funding

The relationship building and technical assessments that took place during the PROGRESS and IMPACT phases laid the groundwork for additional funding and future work to advance the just transition in Portland.

Pursue additional funding. Prosper Portland, PSU, and the City of Portland have committed to partnering on funding applications through 2026 as part of the Clean Industry Initiative. Along with our EPA-funded project that begins in February 2025, in October, we applied to the Portland Clean Energy Fund to create a program that would support industrial projects that create meaningful community benefits. The coalition of applicants includes five members of the PDX Clean Industry Network, plus an environmental justice partner and an industry trade association.

Community engagement for collaborative visioning. One area of future focus is to work with community members to develop a community vision for IS. Our

initial literature review revealed that symbiosis projects around the world are not designed to create community benefits, but during the community workshop we found that environmental justice and workforce development organizations were enthusiastic about IS' potential. With additional funding, we will pursue a sustained community engagement to deepen our relationship with marginalized communities and ensure that all IS projects lead to meaningful community benefits.

Conduct additional technical assessments. We will leverage the CEIP to secure resources for additional technical assessments. With additional funding, we will target outreach to small, BIPOC-owned, and woman-owned industrial businesses. A robust, secure database with information about potential IS opportunities will be crucial for identifying potential projects as well as building trust with the manufacturing sector.

Continue scoping potential projects. As the IMPACT phase wraps, we continue to explore symbiosis pilot projects that reduce energy, water, and materials and provide tangible community benefits. This will likely require identifying sites to co-locate industrial facilities. Potential projects include a mass timber manufacturing facility at the Port of Portland and a circular waste and recycling campus in the Parkrose neighborhood. We have also engaged Portland State University Masters in Urban and Regional Planning students to explore land use strategies for a green and resilient industrial district.

5.3 Anticipated Results

The PDX Clean Industry Network has made significant progress to IS. The team has developed buy-in from the private, public, nonprofit, and academic sectors and are confident that with continued investment, our ecosystem will support innovative carbon reduction projects that provide community benefits.

This work will continue through other partnerships and coalitions which were strengthened through the CEIP. These include the Portland Metro Chamber Clean Industry Hub, a business-led group committed to industrial decarbonization; the CII, a partnership between BPS, PSU, and Prosper Portland to develop clean industry strategies; a pilot project with an environmental justice organization to collect community data on IS; and potentially a five-year PCEF grant for community-serving clean industry projects. Portland Metro Chamber, the region's main business association, recently announced a commitment to help industry reach net zero GHG emissions by 2050. These parallel efforts demonstrate the widespread support for community-focused industrial projects.

The CONCEPT and PROGRESS Awards for the Community Energy Innovation Prize allowed us to catalyze a longer-term investment in equitable industrial

decarbonization in Portland. We adapted this international example to our local context by bringing in frontline community partners and focusing on environmental justice, rather than on new technologies. The Grand Prize Award would allow us to continue advancing a just transition for Portland industry that supports workers and small businesses in the clean economy and creates tangible benefits for disadvantaged communities.