



FROM WASTE MANAGEMENT TO CLEAN MATERIALS

Striving for Balance Between the
Environment and the Economy in the
Pacific Northwest

WASHINGTON | CORE

October 2021

New Approach to Plastic Waste

In the United States, climate change and environmental challenges have received heavy media coverage during the Biden administration. Different ways of thinking about addressing these challenges are now attracting public and government interest. One growing issue that has generated a surge of state-level legislative efforts is plastic waste. The Center for Sustainable Infrastructure (CSI), an independent non-profit organization based in Washington state in the Pacific Northwest, is now working on a new approach to this and other challenges, following the rich tradition of Pacific Northwest-based companies pioneering innovation in the U.S. - including Microsoft, Amazon, and Starbucks.

We interviewed Mr. Rhys Roth, Executive Director of CSI, about CSI's vision for solving some of the most difficult environmental challenges.

CSI,¹ based in Olympia, WA, is helping to bring innovation, new tools, and sustainability excellence to infrastructure planning and investment in the Pacific Northwest. Mr. Roth authored CSI's 2020 From Waste Management to Clean Materials framework,² as well as reports on "Infrastructure Crisis, Sustainable Solutions", "Rewiring the Northwest's Energy Infrastructure" and "A Northwest Vision for 2040 Water Infrastructure." Prior to founding CSI, Mr. Roth co-founded and helped lead the non-profit group Climate Solutions for over 15 years.



Mr. Rhys Roth
Executive Director of CSI³

All-Infrastructure Approach

In 2014, CSI began work on sustainable infrastructure issues. While most infrastructure systems such as transportation, water, energy, waste management, and recycling are traditionally managed independently and siloed from one another, CSI aims to plan and develop a unified "all-infrastructure" approach that will result in innovative proposals. They launched the Five Big Goals for 2040 Report Series, which seeks to analyze regional infrastructure challenges and provide infrastructure decision-makers with innovative solutions for the next 20 to 25 years. The first two sector specific reports in the Big Goals series focused on energy and water infrastructure, and the third and most recent on waste management and recycling. The upcoming reports will focus on transportation and overall infrastructure performance.



Mindset Shift to Clean Materials

Waste management is a sector in need of a mindset shift. This sector has been governed for decades by the concept known as "waste management hierarchy," as established in laws across the U.S. in the 1970s and 1980s. Under this hierarchy, the waste management strategies are prioritized as seen in the diagram at right. In practice, however, investments and resources tend to be overwhelmingly allocated to lower priority downstream activities like disposal in landfills and incineration.

Thus, CSI thought it necessary to develop a more holistic clean materials concept in which upstream waste reduction measures and expanded recycling business opportunities would receive greater attention. An analysis by Senior Policy Analyst David Allaway and colleagues at the Oregon Department of Environmental Quality's Materials Management Program of the waste management cycle revealed that the phases prior to recycling and disposal - the resource extraction, transportation, processing, production, and use of products phases - generate the largest environmental footprint. As a result, the Oregon Plastic Pollution and Recycling Modernization Act, which shifts the waste management focus to upstream phases and establishes producer responsibility for waste collection and recycling, became law on August 6, 2021.

CSI has found in its research that the American public generally likes to recycle and wants to do something right for the environment. Until recently, Americans were not so concerned about recycling waste, because it was primarily shipped to China and Southeast Asian countries for recycling. It is only after China began refusing to accept plastic waste from the U.S. that Americans have become concerned about what happens to the materials that they recycle.

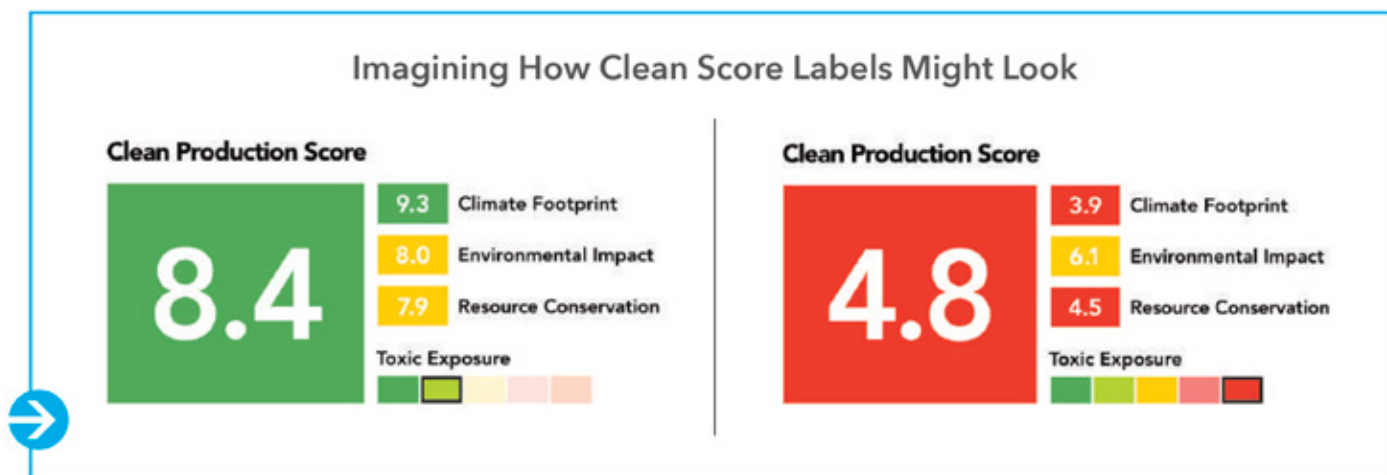
However, Americans are typically unaware of the environmental impact of the goods they purchase, and thus are unable to effectively make the greenest purchase decisions. CSI's "Clean Score" indicator, as illustrated below, is a concept proposed to address this issue by clearly labeling products with a number that quantifies the environmental impact of a product over its life cycle. For example, a Clean Score indicator could allow consumers to compare the life cycle environmental impacts of two similar products offered on online by Amazon to inform their purchasing choices.

The Waste Management Hierarchy according to the U.S. Environmental Protection Agency (EPA)



Source: EPA⁴

CSI Clean Score label concept



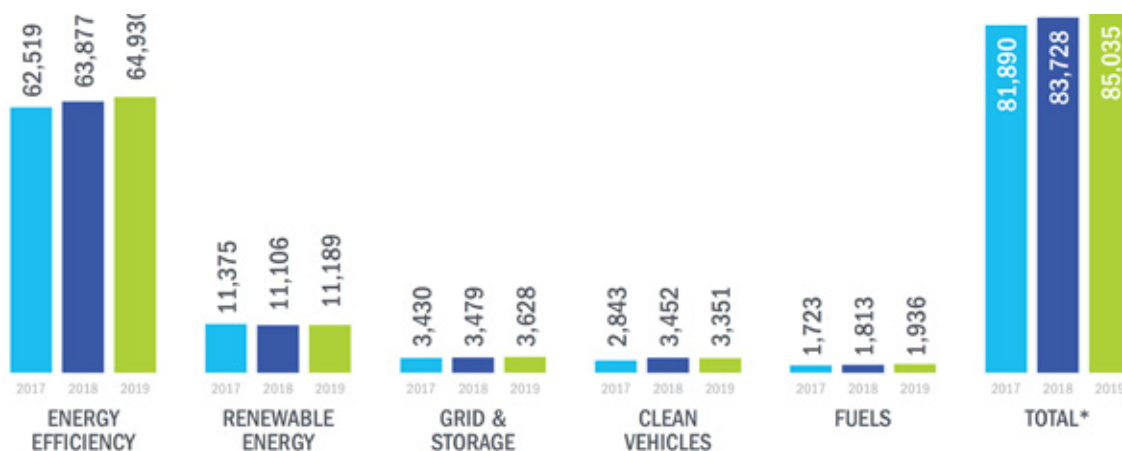
Source: CSI⁵

Balancing Act: Economy and Environment

CSI believes that environmental protection and economic growth can be achieved in tandem. CSI's experience with the clean energy sector in the Pacific Northwest demonstrates this. 20 to 25 years ago, just a few privately-owned solar and wind businesses accounted for what was then a small and fragmented "alternative" energy industry. Advocates re-branded these sectors as "clean energy" and positioned them as opportunities for economic development and job creation. Today, the clean energy sector is responsible for more than 130,000 jobs combined in Washington and Oregon as illustrated in the charts below. CSI hopes to achieve a similar transformation in "clean materials", creating tens of thousands of jobs and significantly reducing the environmental impact of recycling and waste disposal systems.



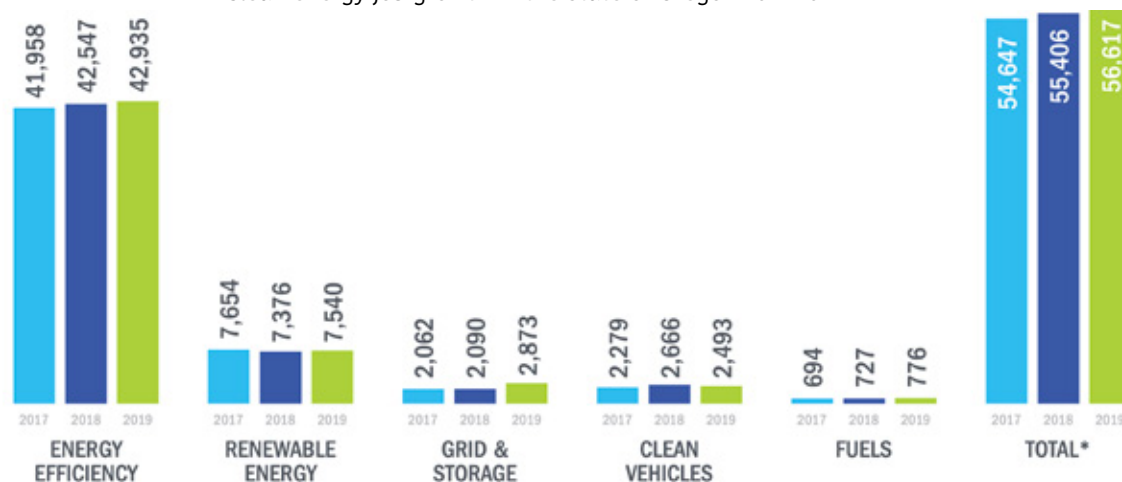
Clean energy job growth in the state of Washington 2017-2019



*While E2's clean energy job reports go back to 2014, due to recent methodology changes, we are unable to confidently provide comparable growth numbers before 2017.

Source: Environmental Entrepreneurs⁶

Clean energy job growth in the state of Oregon 2017-2019



*While E2's clean energy job reports go back to 2014, due to recent methodology changes, we are unable to confidently provide comparable growth numbers before 2017.

Source: E2: Environmental Entrepreneurs⁷

In order to balance the economy and the environment, collaboration between industry and environmental organizations is essential. In the past, the interests of environmental organizations and businesses have often been at odds. However, as the threat of climate change and importance of sustainability become more and more evident, they are now beginning to share a common vision and are developing symbiotic relationships. CSI's goal is to be a bridge that facilitates dialogue between the two sides.

Carbon to Value: Industrial Symbiosis Programs

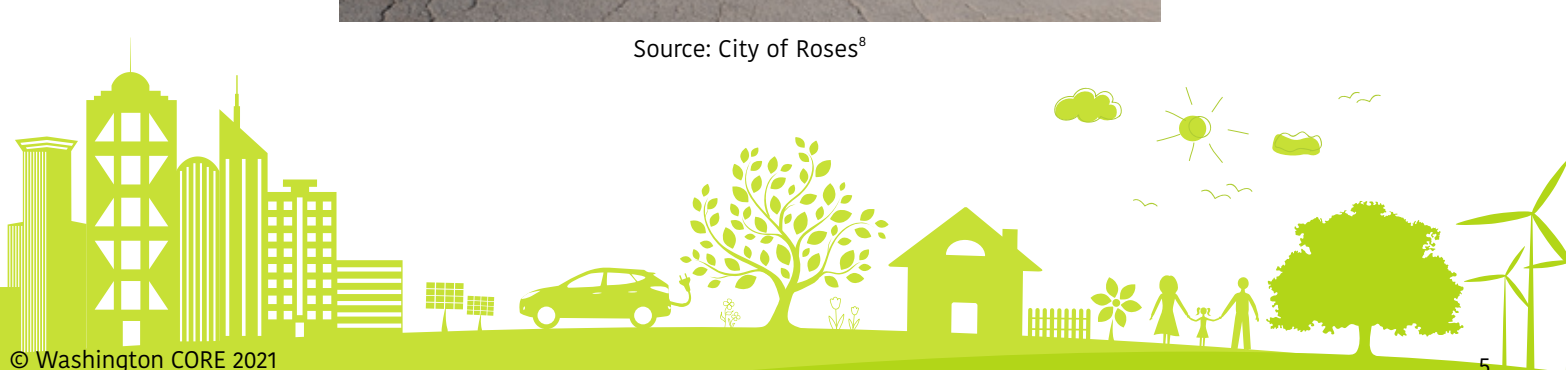
Along these lines, one valuable concept for balancing the economy and the environment is industrial symbiosis, the idea that waste materials could be used for economic benefit. CSI has closely studied a successful program in Denmark, which established the idea of "Industrial Symbiosis," whereby waste from one business becomes a valuable resource for another for mutual economic benefit. Examples include heat, water, CO₂ and organic wastes. In 2019, CSI and a bipartisan group of Washington state representatives visited Denmark to study an industrial symbiosis facility where multiple industries cooperate to create new business opportunities from waste materials. On their return, the members drafted and passed a state law establishing the U.S.'s first industrial symbiosis program. The bipartisan nature of this group was a significant reason why the program was implemented at an exceptionally fast pace.

One example of a regional industrial symbiosis project is the state-of-the-art clean materials campus being developed by the City of Roses (COR) Recycling & Disposal facility in East Portland to incubate and support innovative new recycling companies. COR is the only African-American-owned waste disposal company in the U.S. and employs about 60 local residents. Its waste facility typically buys waste originally sent to landfills, sorts it into various materials such as metals, plastics, asphalt, and other construction materials, and upcycles or recycles them. COR launched the first of its kind Waste Innovation Campus concept to demonstrate cutting-edge technologies and business models for clean materials. The COR campus will house renewable power generation, and thermal loops, where waste heat from one treatment can be returned through the loop to power the next. Clean production and processing hubs of this nature, which vary from region to region, can supply a variety of materials to processing companies.

City of Roses recycling facility in Portland, Oregon



Source: City of Roses⁸



Pacific Northwest to the World

CSI has been concentrating its efforts on identifying and implementing infrastructure sustainability solutions in the Pacific Northwest region, but recognizes the related challenges are global, and looks forward to collaborating with other organizations and governments to achieve a future that is more environmentally and economically sustainable. As pressures grow to deal with mounting plastic waste challenges amidst pandemic-driven financial hardships, CSI's balanced clean materials approach may find receptive audiences in governments across the U.S. and around the world.

Endnote

¹ <https://www.sustaininfrastructure.org/>

² <http://centerforsci.org/wp-content/uploads/2020/06/CSI-Clean-Materials-Report.pdf>

³ <https://www.sustaininfrastructure.org/>

⁴ <https://www.epa.gov/smm/sustainable-materials-management-non-hazardous-materials-and-waste-management-hierarchy>

⁵ <http://centerforsci.org/wp-content/uploads/2020/06/CSI-Clean-Materials-Report.pdf>

⁶ <https://e2.org/reports/clean-jobs-washington-2020/>

⁷ <https://e2.org/reports/clean-jobs-oregon-2020/>

⁸ <https://cordr.com/>

WASHINGTON | CORE

Washington CORE, L.L.C. is an independent consulting & research firm providing strategic research, analysis and advisory services. Founded in 1995, Washington CORE leverages in-depth research capabilities coupled with extensive global networks in both the public and private sectors, to deliver clarity and insight to prepare our clients for success in an ever-changing global landscape.

Please see <https://www.wcore.com> for more information.

