Eco-Nomics – Growing the Green Economy in Washington State

A changing climate creates significant challenges and opportunities on a global, national and regional scale. Governments and businesses around the world are responding to climate change with strategies to mitigate (reduce greenhouse gas emissions) and adapt (prepare for inevitable changes). These strategies require innovative engineering, technologies, and products to address a myriad of changing circumstances.

Washington State is well positioned as a global leader to build the green economy and respond to climate change. Some of Washington's attributes include: recognition of climate change impacts; corporate and business leadership with global markets and supply chains; internet and communication technology and artificial intelligence (ICT & AI) and venture capital; supportive culture and strong environmental values; and world class higher education institutions engaged in research and development (R&D) responding to climate change.

Growing the Green Economy in Washington State (Eco-Nomics) is a high level examination of four industry groups essential to address climate change: energy, water, agriculture and forestry, and building materials. Washington State has deep roots in all four,and is recognized as a leader in clean technology in all of them.

Eco-Nomics examines how well Washington's economy is positioned to provide new clean technologies, manufacturing capabilities, R&D, and education and workforce training to meet emerging trends and opportunities. The Eco-Nomics project is a first step towards development of an Eco-nomic Center in Washington State focused on the green economy.

Summary of findings and recommendations

Washington's relative position as a leader in the four industry groups is measured based on the strength of existing economic activity, potential for future development, and the state's relative position vis-a-vis national and global market demands and trends related to clean technology. The study finds potential for new opportunities in all four groups. However, in water and energy, Washington State has the potential to emerge as a significant national and global leader. In agriculture and forestry and building materials opportunities for lucrative business development exist, but the prospect of broad national or international leadership may be less likely.

Water

The availability and supply of fresh water is a present and emerging crisis across the globe. Climate change will continue to exacerbate this crisis. While water sources are unique, demands are more similar, including: potable, irrigation, industrial uses, waste-water (both a supply and demand factor), surface water and natural resources - sufficient to support natural systems. Addressing demand, efficiencies in water delivery, wastewater treatment and purification present significant opportunities that may be exportable to other localities.

Washington State is well positioned to be a leader in water, serving potentially broad markets. There are markets locally, nationally, and globally for new technologies, products and services for potable water, wastewater, irrigation, surface water, industrial uses and efficiencies. R&D centers in Washington's higher education institutions are already engaged in this work. Likewise, there are Washington companies already developing and applying solutions to water issues. Further developing opportunities will require focused

investments and partnerships on the part of government, business and academia. It will also require marketing resources and assets nationally and internationally.

Leaders in the public sector, private sector and academia should come together to design a Water Innovation Center in Washington State. The key elements are already here. Washington State has the capacity to develop opportunities responding to the growing needs of a parched planet.

Energy

Clean energy sources and efficient energy use are key to responding to climate change and reducing greenhouse gas emissions. Washington State is not likely to be competitive in large scale production of photovoltaic cells or wind turbines. However, the state is well positioned to lead in energy efficiencies, clean and smart technologies.

Washington state has been a pioneer in the global clean tech industry, boasting the largest state trade association of clean tech businesses in the U.S. (The Clean Tech Alliance is a partner in this study), the world's greenest building (Bullitt Center), and a #1 ranking for hydroelectricity production in the nation. Washington has developed competitive advantages across several energy industries according to the state's Department of Commerce 2017-2019 Proposed Strategic Plan for the clean technology industry: energy generation, energy storage, energy infrastructure, energy efficiency and transportation. Many Washington businesses are at the forefront of clean technology, and are contributors to this study including McKinstry, HDR Engineering, and Puget Sound Energy. Washington's education institutions are leaders in R&D and workforce training related to clean technologies.

Leaders in government, business and academia should consider creating a Clean Energy and Technology Center in Washington State. The Clean Technology Alliance provides an existing framework.

Agriculture and forestry

Increasing food production and efficiencies in water and energy will help define the future of agriculture in the face of a changing climate. Washington's higher education institutions have done impressive work in agricultural research led by WSU and UW.

New sustainable farming practices are ripe for investments. Washington State already has emerging companies in these areas. More investments and business development should be encouraged.

Building materials and the build environment

Cross Laminated Timber (CLT) shows promise as a sustainable building material. The advantages of CLT include: smaller carbon footprint, construction efficiencies, fire safety, superior structural capabilities, better forest management and reduced project costs. Research into applications should continue. Additionally, identifying and addressing market and regulatory barriers are necessary if the promise of CLT is to be realized.

Education

Economic sectors (industry groups) are defined in part by the interactions of education institutions with the private sector. Education institutions provide basic R&D and workforce training, and the private sector applies these assets developing goods and delivering services. The relationships are porous, allowing and encouraging human resources to move freely between academic and private institutions, and even between private sector competitors.

With respect to the four industry groups, Washington State has strong education assets. The State's two major research universities (WSU & UW) have nationally recognized programs focused on research and education related to water, energy, agriculture, forestry and environmental science as well as other Washington education institutions.

Demand for energy and clean tech workforce training at community colleges across Washington state is continuing to grow. Building the green economy will require strengthening and focusing higher education resources. It also requires marketing these resources and assets nationally and internationally and partnering with the private sector. With sufficient resources, Washington State is well positioned to meet these challenges.

Integration of ICT & AI in all four business groups

Some of the most sophisticated manufacturing capabilities in the world are located in Washington State including aerospace, technology, biomedicine, and bioengineering. The technology industry is one of the State's economic strengths. Throughout this study, the integration of internet and communication technology is identified as a prospect for new business development.

It is timely to engage Washington's technology and manufacturing companies, as well as academia and the public sector, to develop more focused efforts integrating ICT & AI in these four industry groups.

Recommendations and next steps

The Eco-Nomics study identifies opportunities and first steps towards development of an "Eco-nomic Center" in Washington State (growing the green economy based on four business groups). There are targets of opportunity in all four industry groups. However, based on the study findings, water and energy present the most viable opportunities as "green economy" centers in Washington. What follows are recommendations and next steps:

- Bring together leaders in the private and public sectors, economic development professionals, NGOs (e.g. The Clean Tech Alliance and PureBlue), and academia to inform the development of an Eco-Nomics center for water and energy in Washington State. Such a center would focus on development of the green economy, responding to a changing climate, and would function as a catalyst for a viable industry cluster similar to others such as aerospace, information technology, maritime & trade, and agriculture.

- Develop an inventory of R&D and workforce training assets and capacity in Washington's higher education institutions associated with water and energy. Some examples cited in the study include: UW Climate Impacts Group, TESC Center for Sustainable Infrastructure, WSU Center for Applied Research and Extension, WSU Surface Water Group, UW Center for Urban Waters, WWU Institute for Energy Studies, and Walla Walla Community College Water and Environmental Center and Whitman College. There are other resources as well. Knowing what capacity exits, and how such resources might inform and support an emerging Eco-Nomic center is of great value and should help support increasing funding from various sources.

- Work with public and private water and energy utilities to help form an Eco-Nomics center and evaluate R&D and workforce training needs, as well as emerging opportunities.

- Engage ICT & AI businesses and organizations (e.g. Gates Foundation, Microsoft, Amazon, Google, Bloomberg) to help fund integration with water and energy R&D and products for water, energy and the green economy.

- Address reduction of GHG through energy efficiencies in buildings and transportation. Work with private sector entities such as McKinstry, HDR, Master Builders, utilities, and others to address net zero buildings and EV transportation infrastructure. Also work with cities and counties to explore reforming regulations to expedite energy efficiency for buildings and transportation.

- Identify additional areas of research associated with Eco-Nomics - and the green economy – including health care and transportation. These are areas that were recognized as potential areas for additional study by the AWC-CQC.

- Reach out to the Legislature and Governor to provide initial seed funding for this effort. And, establish a framework to solicit and receive additional donations and contributions from other entities including private sector, and foundations. We are estimating an initial appropriation of $250K to the Department of Commerce to bring together cities (AWC-CQC), public, private, NGO and academia representatives to begin this work.

Eco-Nomic partners

Center for Sustainable Infrastructure
City of Arlington
City of Bellingham
City of Everett
City of Marysville
City of Seattle
City of Spokane
City of Tacoma
Clean Tech Alliance
Communities Attributes, Inc
Department of Natural Resources
HDR
King County Parks and Natural Resources
McKinstry
Paul Roberts Consulting, LLC
Puget Sound Energy
Puget Sound Regional Council
Pure Blue
Snohomish Economic Development Alliance
Snohomish and King County Master Builders
University of Washington
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