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THE CLEAN-TECH MARKET AUTHORITY

OCTOBER 2008

CARBON-FREE PROSPERITY 2025

*How the Northwest Can Create
Green Jobs, Deliver Energy
Security, And Thrive in the
Global Clean-Tech Marketplace*

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About the Lead Authors

Ron Pernick and Clint Wilder are coauthors of *The Clean Tech Revolution*, published by Collins Business, an imprint of Harper Collins, in June 2007 and released in paperback in September 2008. In addition, Ron Pernick is cofounder and managing director of Clean Edge, Inc. and is Sustainability Fellow at Portland State University's School of Business where he teaches a course on clean-tech markets, innovation, and entrepreneurship. Clint Wilder, contributing editor at Clean Edge, has covered the high-tech and clean-tech industries as a business journalist for more than two decades.

Disclosure

Clean Edge or its principals have provided consulting services for or hold equity in the following companies mentioned in this report: Miasolé and Solaicx. Furthermore, the information contained in this report is not intended to be used as a guide to investing, and the authors make no guarantees that any investments based on the information contained herein will benefit you in specific applications, owing to the risk that is involved in investing of almost any kind.

EXECUTIVE SUMMARY

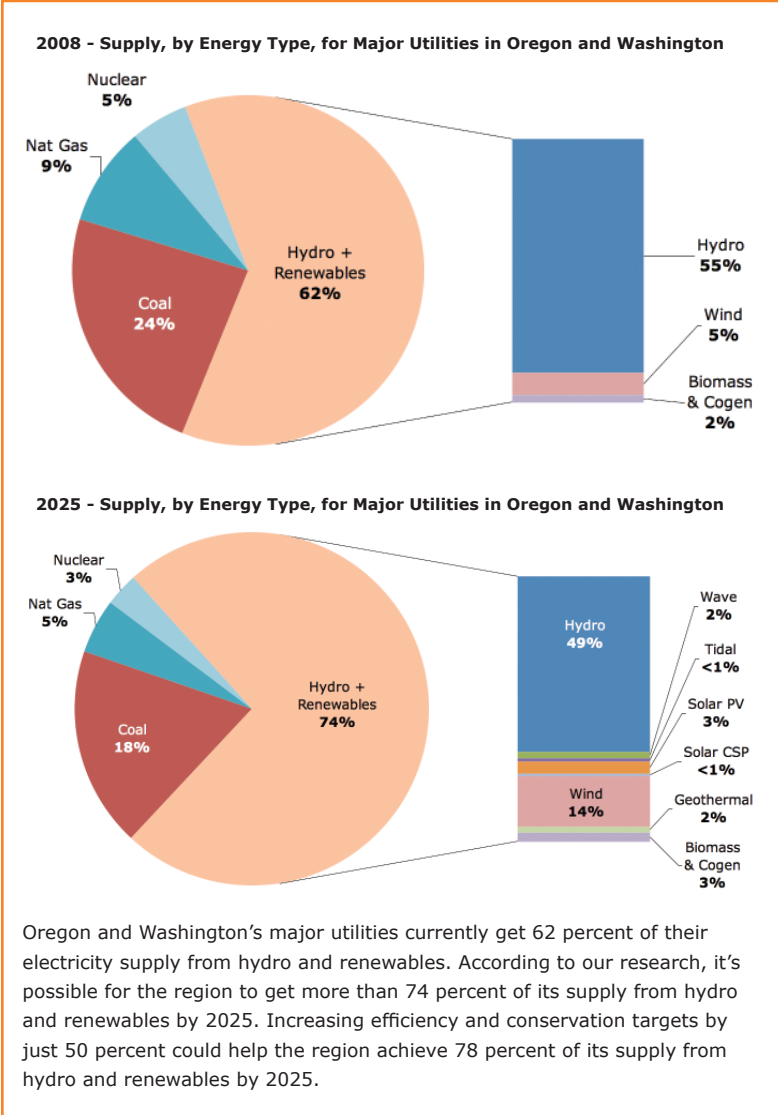
We stand at a unique crossroads in history: the transition from polluting, resource-constrained, fossil-based energy systems to those built on sustainable, renewable, resource-efficient systems. This historic and unprecedented shift, which is occurring within the electric utility market, the transportation sector, and the built environment, offers the promise of greatly reducing the Pacific Northwest’s collective impact on the planet while helping to ensure the livelihoods and well-being of future generations. In a time of deep national economic uncertainty, it also offers one of the greatest opportunities for wealth- and job-creation in more than a generation.

In Carbon-Free Prosperity 2025 we highlight how Oregon and Washington can create green jobs, deliver energy security, and thrive in the global clean-tech marketplace. In a fiercely competitive environment, the Northwest is already leading in a number of critical and emerging clean-energy segments. The region is home to one of the largest planned wind farms in the

world; the largest planned U.S. solar crystal-line photovoltaic (PV) manufacturing facility; the world’s first silicon feedstock production facility completely dedicated to solar; and the largest global manufacturer of advanced meter reading (AMR) devices.

In this report, we outline:

- The region’s key assets (strengths) and barriers (weaknesses)
- The top five clean-tech opportunities for the region, according to our interview and research findings
- A 10-point action plan for reaching carbon-free prosperity in Oregon and Washington
- How the region can be the first in the nation to achieve approximately 75 percent of its electricity supply from carbon-free sources (hydropower + renewables) by 2025
- How the region can create between 41,000 and 63,000 direct jobs by 2025 in just five clean-tech sectors



Assets, Barriers, and Opportunities

Oregon and Washington have a plethora of assets that support the region's drive to capture a dominant position in a number of low-carbon, clean-energy sectors. These include a prevalent green culture; supportive regional government policies; a significant natural resource base; and a strong base of manufacturing infrastructure and knowhow. The region also faces a number of not-so-insignificant barriers that must be overcome, including limited venture capital activity in the region; the lack of a 21st century grid to carry green electrons and accommodate energy intelligence initiatives; and the lack of a coordinated regional strategy.

But our research shows that Oregon and Washington can play a leadership role in a number of select clean-energy sectors. In talking with leaders throughout the region, we asked a number of probing questions to understand which opportunities they felt offered the region the best opportunity for mid-term growth (defined, for the purposes of this report, as between now and 2025) within the context of carbon-free prosperity. Which technologies already had a foothold in the region? In which technology sectors did the region have a unique competitive advantage? Which of these technologies would have the greatest impact on the reduction of carbon, not only within the region, but on the broader global playing field?

Based on these interviews, five areas came out on top. Ranked in order of most times mentioned by our respondents, they are:

Solar PV Manufacturing

Green Building Design Services

Wind Power Development

Sustainable Bioenergy

Smart Grid Technologies

In a medium-growth scenario we could see more than 41,000 jobs in Washington and Oregon by 2025; in an accelerated-growth scenario more than 63,000 jobs.

41,000 to 63,000 Jobs

These five sectors offer significant job growth opportunities for the region. According to our research, in a medium-growth scenario, we could see more than 41,000 jobs in Washington and Oregon by 2025 from these five sectors alone—and in an accelerated-growth scenario, more than 63,000 jobs in the region by 2025.

To put these numbers in perspective, northwest Oregon and southwest Washington's "Silicon Forest" high-tech cluster employed a similar number of employees at its peak a decade ago. It's also 2-3 times the total number of employees working worldwide at Internet giant Google. Our estimates are only focused on the five priority sectors targeted in this report. The potential for green job creation in the region is undoubtedly much broader and larger.

10-POINT ACTION PLAN AT-A-GLANCE

1. Put a price on carbon
2. Increase Washington RPS to 25% by 2025
3. Implement low carbon fuel standards
4. Pass aggressive green building codes
5. Foster regional cooperation
6. Ensure public funding for clean technology via public employees retirement system investments and through targeted clean-tech funds
7. Implement effective tax credits for renewables development
8. Deploy clean-tech workforce development programs
9. Establish government procurement policies for clean-tech products and services
10. Build out regional smart grids and 21st century transmission backbone

10-Point Action Plan

How can the Northwest leverage its assets and overcome its weaknesses to become a world-class center for clean energy and energy efficiency? Based on interviews with key stakeholders, and the collective research of Clean Edge, Inc. and Climate Solutions, we have come up with 10 key strategies.

Reaching carbon-free prosperity will not be easy, but as we point out in this report, creating a vibrant and expanding clean-tech industry is an environmental, geopolitical, and economic imperative. With the U.S. economy in perhaps its most perilous condition in decades, regions throughout the country are seeking new paths to quality job creation and sustainable prosperity. Against this backdrop, the Pacific Northwest has an enormous opportunity.

Compared to many other regions, Washington and Oregon are already in an enviable position. With assets that include abundant clean-energy resources, committed political leadership, progressive public policies, world-class quality of life, and a green-minded, technology-oriented populace, the region has an excellent foundation on which to build a thriving clean-tech economy. With a committed focus on the sectors of solar PV manufacturing, green building design services, wind power development, sustainable bioenergy, and smart grid technologies, we believe that the Northwest can dramatically reduce its carbon output while creating a prosperous 21st century regional economy and becoming an export leader. These efforts will create tens of thousands of skilled, high-paying, family-wage jobs across a diverse range of sectors.

Other regions as near as California and as far away as Massachusetts (indeed, as far-flung as Shanghai and Abu Dhabi) are moving aggressively to court the investors, entrepreneurs, and job seekers of the 21st century clean-tech economy. Building regional clean-tech clusters that steer toward a carbon-free future will be this century's most competitive playing field. If the Northwest wants to compete and thrive in this brave new world—and we firmly believe that it can—then the time to act is now.

Download the full report at www.climatesolutions.org/CarbonFree or www.cleandedge.com

ABOUT CLEAN EDGE AND CLIMATE SOLUTIONS

Clean Edge, Inc., with offices in the San Francisco Bay Area and Portland, Ore., is a leading research and publishing firm that helps companies, investors, and policy makers understand and profit from clean technologies. Founded in 2000 by environmental and high-tech business pioneers Ron Pernick and Joel Makower, Clean Edge and its network of partners and affiliates offer unparalleled intelligence and insight into the clean-tech sector. Among its many activities, the company publishes the annual Clean Energy Trends report, produces the annual Clean-Tech Investor Summit (along with IBF), and maintains a number of stock indexes, including the NASDAQ® Clean Edge® U.S. Liquid Series (CELS) index, which track U.S.-listed clean-energy companies. To keep abreast of the latest clean-tech news, access industry reports, learn more about our annual summit and stock indexes, or sign up for our e-newsletter, visit www.cleandedge.com, email us at info@cleandedge.com, or call 503-493-8681.

Climate Solutions is a not-for-profit organization whose mission is to accelerate practical and profitable solutions to global warming by galvanizing leadership, growing investment and bridging divides in the Pacific Northwest. Since its inception in 1998, Climate Solutions has been the foremost champion of Northwest climate and clean energy leadership that generates economic opportunities for Northwest businesses and workers. Working with a broad array of partners from business, rural, government, and the public-interest community, Climate Solutions helps to advance a new sustainable prosperity in the Northwest that accelerates the technologies, policies, and enterprises that can deliver climate solutions to the world. Climate Solutions has offices in Seattle, Olympia, Portland and Missoula. To learn more, visit www.climatesolutions.org.