Modeled Scenarios to 2020

To assess the potential for the West Coast jurisdictions to capitalize on their existing advantages in the clean economy, preliminary estimates of the size of the clean economy in terms of employment and gross domestic product (GDP) were developed through to 2020.

Making predictions about the future is difficult, especially in a scoping document such as this. To forecast the clean economy market opportunities more authoritatively requires substantial microeconomic and macroeconomic modeling. That being said, the forecasts presented here are based on recent jurisdictional and regional economic forecasts as well as economic modeling that accounts for the tradeoffs, or indirect effects, associated with policy-driven economic changes (see the Methodology Document for more details).

For example, the approach used in this analysis estimates the net jobs created by demand-side management programs after accounting for job losses in the energy production sector associated with less gas and electricity sales. This approach helps to satisfy the criticisms that previous jobs reports have received.[1]

Employment – Figure 10 shows the estimated number of net new jobs under each scenario by clean economy sector across the region, including both Business-as-Usual (BAU) and policy-driven scenarios for growth. The analysis indicates that a set of policy actions, combined with BAU growth, can grow the clean economy by nearly 1.03 million new full time equivalent jobs, or a 200% increase over 2010 baseline numbers. Put another way, for every one clean economy job in 2010, more than two *additional* jobs can be created by 2020. It is important to note that some job losses will occur as a part of the growth of and transition to the new clean economy due to investment shifts, but that net expansion of jobs significantly outweighs losses.

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1 See: http://green.blogs.nytimes.com/2009/03/27/study-forecasts-297000-green-jobs/?scp=1&sq=green%20jobs%202009&st=cse

The analysis indicates that for every one clean economy job in 2010, more than two *additional* jobs can be created by 2020.

Figure 10: Region-wide increase in new clean-production jobs by sector under BAU and policy-driven scenarios, 2010 - 2020.

Potential Increase in New Clean Economy Jobs by Sector (Region-wide from 2010-2020)	2010	2020		
	Baseline	BAU	Policy Driven	
		Potential New Jobs	Potential New Jobs	% Growth
Clean Energy Supply	56,813	Up to 17,000	Up to 132,000	232%
Energy Efficiency & Green Building	80,806	Up to 24,000	Up to 362,000	448%
Clean Transportation	62,359	Up to 18,000	Up to 174,000	278%
Environmental Protection & Resource Management	290,332	Up to 84,000	Up to 312,000	107%
Knowledge & Support	18,162	Up to 6,000	Up to 49,000	270%
Total	**508,462**	**Up to 149,000**	**Up to 1,029,000**	**202%**

Source: GLOBE and CCS, 2012

Absolute employment growth is greatest in the Energy Efficiency and Green Building and the Environmental Protection and Resource Management sectors. The Clean Transportation and the Clean Energy Supply sectors also contribute to significant new job growth, but to a lesser degree.

In terms of their growth potential, three sectors stand out relative to the current baseline: the Energy Efficiency and Green Building sector shows the largest percent increase in new employment, followed by Clean Transportation, and finally Clean Energy Supply.[2]

The Energy Efficiency and Green Building sector is also highest in the net number of new jobs created. Policies targeting building retrofits and high-performance buildings are clearly integral to the region's success in growing the clean economy.

Clean Transportation provides the next fastest-growing segment. The region is poised for success in transportation with its focus on smart growth policies and low carbon fuel standards, as well as natural gas and hybrid/electric vehicles deployment. Clean Energy Supply policies include new renewable energy, as well as electricity transmission and distribution integration and expansion.

While the annual growth rate for Environmental Protection and Resource Management is the lowest of the five sectors, this is partially due to the large 2010 baseline employment figure for the sector. Recycling and waste reduction policies, no-till agriculture, and urban agriculture, forestry, and forest protection policies are likely to provide growth for this critical sector.

Figure 10 above shows large growth in regional market opportunities well above the assumed 3% BAU annual growth rate. However, strong growth in the clean economy over the next 10 years is contingent on leadership in creating demand for goods and services in each of the five sectors. Each of the West Coast jurisdictions has demonstrated considerable leadership and provided a commitment to enabling technological innovation to grow the clean economy.

Optimizing growth in the clean economy will require innovative policies that can leverage public and private capital to provide competitive investment opportunities and a consistent source of demand for clean economy goods and services. The degree to which these policy initiatives are successful will, of course, determine the overall results.

Gross Domestic Product – Estimates were generated using multipliers that represent net jobs created (or lost) per million dollars of gross output based on Canadian and US input-output accounts, which have algorithms to convert gross output to gross domestic product (see the Methodology Document for more details).

The analysis shows that under the policy-driven scenario combined with business-as-usual growth, the West Coast region's clean economy could expand by an additional net $95.5 billion in GDP by 2020, over the estimated value of the region's clean economy in 2010 of $47.2 billion (see Figure 11).

Estimates of Regional Investment – The above estimates for growth in GDP contributions and employment also signal massive clean economy investment opportunities for the West Coast region. Based on CCS economic analyses,

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2 The Knowledge and Support sector is under-represented in the Brookings Institute data as these jobs tend to be rolled-up into production jobs, so the sector has a very small 2010 baseline value that contributes to its rapid annual growth rate. Due to the lack of detailed data on the Knowledge and Support sector, we assume that it grows in the policy case at the average growth rate of the other four sectors.

Figure 11: Region-wide increase in clean economy GDP by sector under BAU and policy-driven scenarios, 2010-2020 ($ millions).

Potential Increase in GDP by Sector (Region-wide from 2010-2020 in $ millions)	2010	2020	
	Baseline	**BAU** Potential Growth in GDP	**Policy Driven** Potential Growth in GDP
Clean Energy Supply	$13,757	Up to $4,100	Up to $32,000
Energy Efficiency & Green Building	$5,885	Up to $1,800	Up to $26,400
Clean Transportation	$3,197	Up to $900	Up to $8,900
Environmental Protection & Resource Management	$23,113	Up to $6,700	Up to $24,800
Knowledge & Support	$1,241	Up to $400	Up to $3,400
Total	**$47,193**	**Up to $13,900**	**Up to $95,500**

Source: GLOBE and CCS, 2012

estimates of direct investment potential as a function of clean economy job creation were prepared. Preliminary estimates of the cumulative direct investment opportunities through 2020 range between $147 and $192 billion (in $2010).

Next Steps – In this preliminary report, the market opportunities for 2020 are based on results derived from analyses performed outside of the West Coast region. As a result, the macroeconomic indicators of a thriving clean economy – such as GDP, employment, and investment – require further analysis to be quantified for greater accuracy and linkage to specific policy actions and region-specific competitive advantages. Additional time and resources are required to produce estimates of the baseline clean economy growth, as well as the macroeconomic impact of policies aimed at driving the clean economy. Next steps for this study should include:

○ An in-depth baselines analysis and decomposition of the existing and BAU future market activities and policy actions in each jurisdiction. This "existing and future baseline action analysis" can help evaluate the benefits of current state low carbon fuel standards, renewable portfolio standards, green building policies, and other current and planned activities, as well as provide baselines for evaluation of incremental new policy actions.

○ A list of candidate market and data-driven policy options to grow the entire clean economy needs to be developed and its microeconomic and macroeconomic impacts estimated, along with other key performance metrics such as clean energy advancement, environmental improvements, and regional synergies. This list includes examples of existing actions within the region, as well as innovative new actions that comprise a full range of potential policies to capture and expand the emerging clean economy.

○ Priorities for market and policy action focus must be developed to meet job creation objectives, based on performance metrics, benchmarks, and expertise within the region. Priorities must address immediate, mid-term, and long-term actions needed to position the region for maximum benefit from the new clean economy.

○ Given the imperative for job creation in the region, a detailed macroeconomic and investment flow analysis is needed to provide economic impact analyses for GDP, income, and employment, as well as detailed inflows and outflows of investments and revenues for specific clean economy market segments and policy actions. The investment patterns within each jurisdiction, as well as trade and investment between jurisdictions, can help to identify how the clean economy market opportunities can be optimized. Distributional impacts, or delineation of winners and losers, is also critical to support equity based policy choices, and will be possible through detailed macroeconomic analysis and supplemental evaluations.

These analyses may be provided for the West Coast jurisdictions individually and/or for the region as a whole. This type of empirical research will help facilitate the conversion of the West Coast clean economy market opportunities into realized clean economy growth.