Addendum: New Green Jobs Estimate and Methodology

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The 2011: Q3 edition of *New England Economic Indicators* featured an article by Ross Gittell and Josh Stillwagon, titled "Tracking Jobs in Clean Industries in New England," that provided a review of the various measures of jobs in clean industries—often called "green jobs." Since the article's publication the Bureau of Labor Statistics (BLS) has released its own estimates of green jobs.[1] The following addendum provides a brief comparison of the green jobs estimate and methodology released by the BLS to those found in the Gittell and Stillwagon (G & S) article published in our Indicators series.

Overview of Definitions and Methods

The new BLS estimates are the first of a pair of BLS estimates related to green jobs. The current release only considers output-based jobs, which are defined as "producing goods or providing services that benefit the environment or conserve natural resources."[2] Using this definition, the BLS identified 333 potentially green industries (out of the 1,193) in the 2007 North American Industry Classification System (NAICS). These 333 industries cover approximately 20 percent of the nation's employment. The BLS used a sample of 120,000 firms from within these industries to develop its estimates.

One of the major difficulties in developing accurate green jobs estimates is deciding how to handle firms that do not solely produce green goods (for instance, a traditional home builder that also offers weatherization services). In order to address this issue, the BLS asked firms to estimate the percentage of their revenue generated by green activities. The BLS then apportioned the firm's total employment using this share. For example, if a firm reported that it generated 25 percent of its revenue from green services and employed 200 people, 50 of those employees counted towards the green jobs estimates. As will be discussed in more detail later, this technique/

approach is the greatest strength of the BLS methodology over other methodologies.

The G & S piece relies on four separate definitions of green jobs. The first is the definition established by The Pew Charitable Trusts (Pew). Pew first began by identifying companies receiving venture capital funds designed to support investment in the environment and clean energy technology. This list was supplemented with a list of companies from "green business directories, press coverage, published articles, and databases of government incentive programs for renewable energy." Using the Standard Industry Classification System (SIC) codes associated with these identified businesses, Pew researchers developed estimates of the number of workers at similarly classified firms. This list was then supplemented using automated Internet searches. Since Pew only considered wholly green SIC codes and wholly green firms, no apportioning strategy was adopted. Pew acknowledges that this lack of apportionment may render their estimates conservative.

The Brookings Institution (Brookings) was responsible for the second definition used by G & S. Brookings built off the SIC codes used by Pew and supplemented these with codes selected by researchers at the University of California at Berkeley. Brookings also supplemented its list with additional companies by using "member lists, certifications, grantees, and other sources." Brookings attempted to perform an apportioning strategy similar to the one used by the BLS, but the shares which Brookings used to apportion employment were developed on an ad hoc basis and were based on company documents, as available.

The next two definitions were developed by G & S. The first, referred to as the NAICS definition, was developed in conjunction with Moody's Analytics. It includes 11 industries that had "significant activ-

Table 1. Comparison of Green Jobs Estimates by Various Methodologies

Definition and Latest Year:	Pew 2007	Brookings 2010	NAICS 2009	NETS 2009	BLS 2010
United States	765,060	2,675,545	5,061,230	254,701	3,100,000
New England	51,343	137,360	304,930	10,514	168,749
Connecticut	10,147	29,751	59,770	2,947	39,207
Maine	6,000	12,212	14,710	1,017	13,925
Massachusetts	26,678	63,523	178,030	3,481	79,307
New Hampshire	4,029	12,886	27,420	1,536	11,502
Rhode Island	2,328	9,563	14,230	603	11,924
Vermont	2,161	9,425	10,770	930	12,884

Source: Tracking Jobs in Clean Industries in New England, and U.S. Bureau of Labor Statistics Green Goods and Services press release, March 22nd.

ity in providing products and services used to store and conserve energy, produce energy from renewable and low-carbon sources, treat waste, and conserve and manage water and other natural resources."[3] These codes were then used to derive estimates based on BLS employment data. The second definition, the National Establishment Time-Series Database (NETS) definition, is based on a list developed by researchers at Berkeley (mentioned earlier). Using this set of industries, G & S were able to develop estimates using NETS data. The methodological appendix describing these two definitions does not indicate that G & S used an apportioning strategy.

Comparison and Conclusion

In developing reliable estimates of green jobs, one of the most crucial parts of the process is the ability to apportion jobs within firms that are not completely "green." Without this ability, researchers are forced to decide between a restrictive definition of green industries by only counting industries that are wholly green, or risk counting jobs that do not support conservation or the environment. A large amount of the variance in estimates can be explained by different tolerances for these types of errors and the use of methods to minimize such errors. The BLS methodology has a unique advantage in this context. The number of industries considered potentially green by the BLS was far larger than the number considered by the NAICS definition proposed by G & S.[4] However, because the BLS has the ability to apportion jobs, it can afford to cast a wider net without worrying that it will count nongreen jobs as green.

Table 1 provides the latest available estimates for the New England states, the region, and the nation us-

ing each methodology. Nationally, it is apparent that the BLS's estimates are substantially larger than many of the other estimates, with only the NAICS definition producing higher estimates. It is interesting to note that despite the significantly wider range of industries considered by the BLS, their estimates are lower than those derived under the NAICS definition. The relative smallness of the BLS estimates, notwithstanding the NAICS' narrower set of industries under consideration, is evidence of the importance of industry selection as well as the ability to apportion jobs.

Comparison of state-level estimates reveals that these differences can be even more pronounced at the state level. As an example, the NAICS methodology produces national employment estimates from 2009 that are 1.6 times larger than the BLS estimates from 2010. The same comparison across the New England states showed that the BLS measure ranged from 0.8 times the size of the NAICS measure in Vermont to 2.4 times the NAICS measure in New Hampshire. In addition, the NAICS estimates for green employment in Massachusetts comprised 58 percent of the green employment in New England, while under the BLS definition this share is closer to 46 percent. It is not completely clear what drives these state level differences, but it is likely related to a relatively high in-state concentration of industries considered green by the NAICS definition.[5]
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Endnotes

[1] For more information regarding the BLS press release, see http://www.bls.gov/ggs/. While no historical data is available, new output-based estimates are expected to be released every quarter.

[2] The second set of estimates, which are slated to be released by early July, will cover process-based jobs. These are jobs "in which workers' duties involve making their establishment's production processes more environmentally friendly or use fewer natural resources." The BLS intends to release at least one more year of estimates under this program. Additional estimates detailing wages and employment at the occupation level are expected to be released in September.

[3] The word "industries" is used interchangeably to refer to differing levels of details. The NAICS definition captures 11 industries at the 4-digit level, and thus 63 industries at the 6-digit level. The BLS definition captured 333 industries at the 6-digit level. Of the 63 industries considered green in the NAICS methodology, the BLS only counted 38 as green.

[4] Unfortunately, it is only possible to directly compare the NAICS definition to the BLS methodology because the other definitions use SIC codes.

[5] In addition to state-level aggregate green employment estimates, the BLS also produces private sector industry level estimates. Please see tables 4, 5, and 6, http://www.bls.gov/news.release/ggqcew.toc.htm.