



GREEN JOBS FOR YOUTH

How many youth hold green jobs?

Will more green jobs mean more jobs for youth?

A preliminary analysis of youth in the green economy

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Interest in green jobs has grown dramatically in the last decade, and so has the number of studies around the world looking at the number and types of green jobs. Very few studies have looked at the demographics, however, of future and current green jobs holders, and none has asked how many young people hold or might hold green jobs. This is in spite of an economic crisis in which youth unemployment has increased beyond its already above average levels compared to the overall economy, including an all-time high in the United States of nearly 20% youth unemployment. At least in the United States, there is no direct data on youth employment in green jobs. However, by comparing the industries with the most green jobs with those that employ the most youth, we find that there is a negative correlation: on average, youth jobs will likely not be green jobs. However, since green jobs are expected to create more jobs overall in the economy, especially compared to equal investments or policies designed to support fossil fuels, more jobs overall will likely mean some increase in jobs for youth. Also, since young people in the U.S., at least, express a strong interest in renewable energy and fighting climate change, we might expect youth to choose green jobs over traditional or fossil fuel jobs within each industry. However, given the uncertainties and assumptions in youth green jobs data, more research is needed, and future green jobs studies and policies should consider the employment potential among various demographics, including across different ages of workers.

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1. An introduction to youth unemployment

During the height of the economic recession in 2009, globally 81 million young people aged 15-24 were unemployed. The youth unemployment rate rose from the pre-crisis 2007 level of 11.9% to 13%, leaving 7.8 million additional youth without work. This increase was compounded by a larger decline over the last decade in labor force participation, where youth actively participating in labor markets shrank 4% to 50.8% in 2008. All told, the economic recession has significantly impacted the livelihoods of young people around the world and thus threatened the economies and societies that they support¹.

Youth unemployment differs substantially from adult unemployment in both cause and solution. There are legitimate supply-side considerations for higher rates among youth, such as temporary voluntary unemployment while gaining experience, and forgoing employment to continue education. These youth depend on support structures – e.g., family and government assistance – but this is lacking in many developing countries, and youth entry into the workforce is unduly hindered. A labor market bias against youth also exists. Employers are more likely to terminate youth employees because of less investment in jobs skills and the criteria for unemployment benefits in many countries that often exclude recent hires².

Youth can be a great burden on societies when idle, but if given appropriate work they can also be key drivers of economic growth. This untapped potential is particularly striking in developing countries, where unemployment tends to increase with education levels. Well-educated young people facing discrimination as well as poorly designed job growth policies in these countries become an even greater burden to society when the costs of education are factored in, and may travel overseas to find work, reinforcing the “brain drain” of talent out of under-served communities³.

In the U.S., youth unemployment peaked at 19.1% in July 2010, an all-time high. Because of the economic recession, this was also the first time that youth labor force participation dropped below 50% during July. Jobs were lost proportionately throughout the economy, indicating that the youth are particularly responsive to economy-wide fluctuations⁴.

2. The green jobs potential in the U.S.

Before 2000, very few studies examined the potential of green jobs. Since 2000, however, the number of studies examining the employment potential of green jobs increased dramatically. Several dozen green jobs studies now exist in English alone, as well as many others written in a variety of languages and focusing on numerous parts of the world.

English-language green jobs studies⁵ have been prepared by a wide range of analysts –

1 International Labour Office. 2010. Global Employment Trends for Youth. Available at http://www.ilo.org/wcmsp5/groups/public/---ed_emp/---emp_elm/---trends/documents/publication/wcms_143349.pdf. Accessed April 11, 2011.

2 Ibid.

3 Ibid.

4 2010. Employment and Unemployment Among Youth Summary. Washington: Bureau of Labor Statistics. Available at <http://bls.gov/news.release/youth.nr0.htm>. Accessed April 11, 2011.

5 Several lists of green jobs studies can be found in the following sources, though none provide a comprehensive

government agencies, industry associations (particularly renewable energy associations), think tanks, and university academics. Their scope ranges everywhere from single-state impacts, to national studies, to global estimates. Their approaches also vary significantly, from estimating the jobs created by large cash investments in renewable energy generation (especially versus an equivalent investment in fossil fuels), the impact or projected impact of specific legislation or proposed legislation (such as greenhouse gas limits, renewable portfolio standards, or economic recovery spending), to simply cataloging the number of green jobs in previous years.

While not without criticism⁶, and so different in their approaches and scopes that they cannot easily be compared, the studies' conclusions have nonetheless reported generally encouraging conclusions for the potential of green jobs to generate significant numbers of jobs, particularly more jobs than comparable investments or policies directed toward fossil fuel jobs. For example, one estimate of a \$100 billion “green recovery program,” versus an equal investment in the oil industry, predicts the green recovery program would generate 1.5 million *more* jobs⁷.

This is because green industries, such as solar panel or wind turbine production, tend to be relatively more labor intensive than comparable fossil fuel jobs, such as coal mining, which are more heavily mechanized. Or, they tend to have a very similar, and also labor intensive, employment profile compared to the industry they replace (traditional building construction replaced by energy efficient building construction will still require many carpenters, electricians, etc., for example).

What green jobs studies have *not* investigated much, however, are many of the demographics of current (and likely future) green jobs holders⁸. This is especially true for race, gender, age, and ethnicity. At least one study⁹ has at least looked at education and income levels of potential green jobs holders, concluding that low-income (and, indirectly, minority) workers would likely have more job opportunities overall if there were more green jobs. Another, meta analysis¹⁰ of several prior green jobs studies found mixed but overall positive employment benefits for black, Asian, female, and Latino/Hispanic workers, relative to whites and males, both in the 2000's and possibly through 2018. Beyond these two studies, however, little work has been done on green

listing: 2009. Review of Green Jobs. Washington: Pew Center on Global Climate Change. Available at <http://www.pewclimate.org/review-greenjobs>. Accessed April 11, 2011.

Kammen, Daniel M., Kamal Kapadia, and Matthias Fripp. 2006. Putting Renewables to Work: How Many Jobs Can the Clean Energy Industry Generate? Berkeley: Renewable and Appropriate Energy Laboratory: University of California, Berkeley. Available at <http://socrates.berkeley.edu/~rael/papers.html>. Accessed April 11, 2011.

6 Center for Energy Economics. 2008. Green Jobs: A Review of Recent Studies. Austin: The University of Texas at Austin.

7 Pollin, Robert, and Jeanette Wicks-Lim. 2008. Job Opportunities for the Green Economy: A State-By-State Picture of Occupations that Gain from Green Investments. Amherst, MA: Political Economy Research Institute, University of Massachusetts, Amherst.

8 Gracey, Kyle. 2011. Is This the Face of Green Jobs? Green Economy. Washington: Worldwatch Institute. Available at <http://blogs.worldwatch.org/greeneconomy/is-this-the-face-of-green-jobs/>. Accessed April 11, 2011.

9 Pollin, Robert, Jeannette Wicks-Lim, and Heidi Garrett-Peltier. 2009. Green Prosperity: How Clean-Energy Policies Can Fight Poverty and Raise Living Standards in the United States. Amherst, MA: Political Economy Research Institute, University of Massachusetts, Amherst. Available at <http://www.greenforall.org/resources/green-prosperity/green-prosperity/download/>. Accessed April 11, 2011.

10 Gracey, Kyle. 2010. Green Jobs: Who Benefits? Demographic Forecasting of Job Creation in U.S. Green Jobs Studies. Masters Thesis. Chicago: The University of Chicago. Available at http://chicago.academia.edu/KyleGracey/Papers/169999/Green_Jobs_Who_Benefits_Demographic_Forecasting_of_Job_Creation_in_U.S._Green_Jobs_Studies. Accessed April 11, 2011.

jobs demographics, at least in the United States.

No previous studies have analyzed youth employment, to the authors' knowledge.

3. How many youth have green jobs?

If there are no studies specifically analyzing the number of youth holding green jobs, existing sources of labor data still allow us to make some very rough estimates. In the United States of America, the Department of Labor's Bureau of Labor Statistics (BLS) provides the most comprehensive data on workers and their demographics, particularly through their Current Population Survey (CPS), a monthly and annual statistical survey of national employment¹¹.

CPS provides data on worker gender, race, Latino or Hispanic ethnicity, detailed industry category, detailed job category, and more, but not age¹². Separately, CPS has overall data on employment or unemployment by age (16 years old and above)¹³. It shows that youth ages 16 through 29 experienced higher levels of unemployment in 2010 than the overall population (25.9% for 16-19 years old, 15.5% for 20-24 years old, and 10.9% for 25-29 years old, compared to 8.5% for 35-44 years old, and 7.7% for 45-54 years old)¹⁴.

BLS also does not have any data on employment in green jobs, let alone green jobs by age. BLS has developed a comprehensive set of definitions and categories of occupation and industry types that include green jobs, and is in the process of conducting its first statistical sampling of total green jobs, which is expected to be released in 2012. BLS will not provide demographic distributions of green jobs, however¹⁵.

Fortunately, a preliminary analysis from BLS of provides a way to estimate youth green jobs employment at an aggregate level. Table 1 shows overall industry categories where most green jobs would be located, based on BLS's definition of green jobs¹⁶. Note that this data does *not* quantify *numbers* of green jobs. It does, however, indicate which sectors of the economy contained the most green jobs in 2009 in the United States.

11 2011. Current Population Survey. Washington: Bureau of Labor Statistics. Available at <http://www.bls.gov/cps>. Accessed April 6, 2011.

12 2010. Labor Force Statistics from the Current Population Survey. Washington: Bureau of Labor Statistics. Available at <http://bls.gov/cps/tables.htm>. Accessed April 6, 2011. (Especially tables 11 and 18)

13 2010. Employment status of the civilian noninstitutional population by age, sex, and race. Bureau of Labor Statistics. Washington: Government Printing Office. Available at <http://bls.gov/cps/cpsaat3.pdf>. Accessed April 6, 2011.

14 Ibid.

15 2011. Measuring Green Jobs. Washington: Bureau of Labor Statistics. Available at <http://bls.gov/green>. Accessed on April 6, 2011.

16 "Green jobs are either:

1. Jobs in businesses that produce goods or provide services that benefit the environment or conserve natural resources.
2. Jobs in which workers' duties involve making their establishment's production processes more environmentally friendly or use fewer natural resources." (Ibid)

Table 1. Number and percent distribution of establishments in industries where green goods and services are classified, by industry sector, 2009

Industry sector	Number of establishments	Percent distribution
Construction	820700	38.1
Professional and business services	779100	36.2
Other services (Repair and maintenance services, professional organizations)	183300	8.5
Natural resources and mining	88700	4.1
Information	77000	3.6
Manufacturing	77700	3.6
Trade, transportation, and utilities	49300	2.3
Public administration	42100	2
Education and health services	26400	1.2
All other sectors	10400	0.5
Total	2154700	100

Source: 2011. Measuring Green Jobs. Washington: Bureau of Labor Statistics. Available at <http://bls.gov/green>. Accessed on April 6, 2011.

While BLS does not collect detailed occupation or industry category employment by age, it does have aggregate industry employment for youth 16-24 during July of each year, the high point of youth employment in the United States. A portion of this table, removing racial and Latino/Hispanic ethnicity disaggregation, and July 2010 data, is reproduced in Table 2.

Combining information from the two tables, as seen in Table 3, most youth employment (at least for youth 16-24) appears *not* to be clustered in the industries most likely to have green jobs. Similarly, most green jobs firms tend *not* to employ a large fraction of the youth workforce (again, for youth 16-24).

Although not a definitive quantification of youth employment in green jobs, and not applicable beyond the United States, the evidence suggests that youth will *not* be large beneficiaries of a growth in green jobs. It is possible that the green jobs employment profile of youth 25-29 is larger. This is likely, given that the overall demographic and employment profile of these older youth is comparatively closer to that of workers 30-64¹⁷, the group most likely to hold jobs in the industries with the most green jobs firms. Unfortunately, BLS data is not available to confirm or refute this.

17 2010. Employment status of the civilian noninstitutional population by age, sex, and race.

Table 2. Employed persons 16 to 24 years of age by industry, class of worker, race, and Hispanic or Latino ethnicity, July 2009-2010 [Numbers in thousands. Data are not seasonally adjusted.]

Industry and class of worker	Total	Percent Distribution
	2009	
Total employed	19304	100
Agriculture and related industries	381	2.0
Nonagricultural industries	18923	98.0
Private wage and salary workers	16986	88.0
Mining, quarrying, and oil and gas extraction	44	0.2
Construction	871	4.5
Manufacturing	1068	5.5
Durable goods	580	3.0
Nondurable goods	488	2.5
Wholesale trade	321	1.7
Retail trade	3851	19.9
Transportation and utilities	413	2.1
Information	317	1.6
Financial activities	823	4.3
Professional and business services	1350	7.0
Education and health services	2141	11.1
Leisure and hospitality	4799	24.9
Other services	988	5.1
Government wage and salary workers	1588	8.2
Federal	201	1.0
State	516	2.7
Local	871	4.5
Self-employed and unpaid family workers	350	1.8

Source: 2010. Washington: Bureau of Labor Statistics. Available at <http://bls.gov/news.release/youth.t03.htm>. Accessed on April 6, 2011.

Table 3. Industries likely to supply green jobs and industries most likely to employ youth.

Industry	% of all green jobs firms	% of all youth employment
<i>Most Green Jobs Firms, Low Youth Employment</i>		
Construction	38.1	4.5
Professional and business services	36.2	7.0
<i>Most Youth Employment, Few Green Jobs Firms</i>		
Leisure and hospitality	<0.5	24.9
Retail trade	<0.5	19.9

Source: Author, from BLS data (previous two tables).

4. Indirect and induced youth jobs

In addition to the jobs created directly through investments in green industries, there are numerous jobs that will be created as an indirect result of the increased economic activity. Broadly, the employment effects are classified into (i) direct jobs, (ii) indirect jobs, (iii) induced jobs, and (iv) savings-induced jobs (see Table 4). Many of the existing green jobs studies cited above differentiate direct and indirect jobs, while neglecting induced jobs.

Table 4. Methods of job creation from green investments.

Job Type	Description	Typical Sector
Direct	Construction, maintenance and associated services of green industries (“green jobs”)	Construction, Professional services
Indirect	Production of intermediate goods and services for green industries	Manufacturing, Professional services
Induced	Expansion from increased economic activity from the above two wage-earners	Economy-wide
Savings-Induced	Expansion from redirected consumer spending, i.e., energy savings from efficiency improvements	Economy-wide

Direct jobs are those that are most properly called green jobs, in that the job is actually producing an environmentally friendly good or service. These tend to be the largest category of jobs created. The second largest tend to be what are called indirect jobs, those that perform supportive services to the companies and individuals engaged in direct green jobs, or otherwise create jobs due to spending throughout the economy by green jobs companies. These are often activities such as accounting or legal services, but could include any sector. The third, and usually smallest, category, are known as induced jobs, and represent positions created by green jobs employees spending their wages throughout the wider economy. These often include jobs like retail and food service, but also extend to jobs throughout the economy¹⁸. When these three effects are taken into account, investments in clean energy are estimated to create three times as many jobs as equivalent investments in the fossil fuel sectors¹⁹.

Another type of induced job – savings-induced jobs – is even more important when considering energy efficiency improvements. For example, from the saved money on reduced energy bills, consumers will redirect spending to other goods and services. Since the fossil fuel sectors are largely intensive in capital and not in labor, there will be more jobs created through increased discretionary spending in the wider economy. Efficiency programs in California from 1972-2006, for example, saved over \$56 billion, which led to \$45 billion in increased payrolls for 1.5 million full-time new jobs (net of losses in traditional energy sectors). It has been estimated that up to fifty new jobs are created for every one forgone because of efficiency improvements²⁰.

18 See page 25 for one example of these three job categories in an actual study: Booz Allen Hamilton. 2009. Green Jobs Study. Washington: U.S. Green Building Council.

19 Pollin, Robert.

20 Roland-Holst, David. 2008. Energy Efficiency, Innovation, and Job Creation in California. Berkeley, CA: Center for Energy, Research and Economic Sustainability, University of California, Berkeley. Available at http://are.berkeley.edu/~dwrh/CERES_Web/. Accessed April 11, 2011.

Since youth are employed heavily in the service sector, approximately 74% in 2009²¹, they will on average benefit more from induced jobs due to green investments. Similarly, youth are disproportionately underemployed in mining, utilities and oil and gas extraction industries²². Because overall youth employment levels respond acutely to economy-wide fluctuations, they stand to benefit most from induced jobs through a general pick-up in economic activity.

While there is no quantitative data to show whether in a given industry green jobs will be taken up by youth in higher proportions compared to traditional jobs, numerous polling results demonstrate that environmental issues rank high on the list of priorities of youth. Youth aged 18-29 were 75% in favor of a bill proposed in the U.S. House of Representatives in 2009 that would have implemented a cap-and-trade program of limiting greenhouse gas emissions²³. Similarly, youth favor investments in green energy, with a majority saying they would be much more likely to support a Congressional candidate that supported renewable energy²⁴. In terms of education, 64% of incoming undergraduates and their parents consider a school's environmental commitment a major factor in deciding where to attend²⁵.

5. Conclusions and recommendations

A survey of several dozen green jobs studies in English show that the benefits of promoting environmentally-friendly goods and services are great. When the direct as well as indirect and induced effects are considered, investments in clean energy, for example, are estimated to create three times as many jobs as fossil fuel investments. However, no study to date has analyzed the effect of these policies on various demographics, including young workers.

Using U.S. Bureau of Labor Statistics data on industries and occupations that favor green jobs as well as youth employment data in those industries, the authors concluded that youth will on average not have as much direct benefit from green jobs programs compared to adult workers. However, as numerous studies on the indirect and induced effects of green jobs investments have shown, there are benefits economy-wide from these programs, and especially in youth-heavy service occupations. Combined with the fact that youth are disproportionately underemployed in fossil fuel industries, and they are on average more environmentally-conscious, youth are more likely to embrace green jobs, all other considerations being equal.

This preliminary analysis indicates that more research is needed to determine the prospects for youth employment in a green economy. The authors believe that governments and research institutes should consider more carefully age demographics when designing green jobs policies.

21 2010. Washington: Bureau of Labor Statistics. Available at <http://bls.gov/news.release/youth.t03.htm>. Accessed on April 6, 2011.

22 Ibid. 2011. Current Population Survey. (Table 17)

23 Benenson Strategy Group. September 15, 2009. Youth poll results. Available at http://www.bsgco.com/releases/ACES_Release.pdf. Accessed April 11, 2011.

24 Anzalone Liszt Research. September 15, 2010. Young adults hold key to keeping democratic majority. Available at <http://www.rockthevote.com/assets/publications/research/2010/2010-demmemo.pdf>. Accessed April 11, 2011.

25 The Princeton Review. 2010. College Hopes and Worries Survey Report. Available at http://www.princetonreview.com/uploadedFiles/Test_Preparation/Hopes_and_Worries/HopeAndWorries_Full%20Report.pdf. Accessed April 11, 2011.