“Where your talents and the needs of the world cross, therein lies your vocation.”

Aristotle

“... We’ll put people back to work rebuilding our crumbling roads and bridges, modernizing schools that are failing our children, and building wind farms and solar panels, fuel-efficient cars and the alternative energy technologies that can free us from our dependence on foreign oil and keep our economy competitive in the years ahead.”

US President Barack Obama
Introduction

‘Green-collar jobs’ allow all of society to engage in the two most critical objectives of the next decade: equitably protecting the environment and future-proofing the economy. Creating green jobs and a sustainable economy is a perfect example of two of the themes of this book, ‘a logic too compelling to ignore’ and ‘opportunity in necessity’. In other words, we have to do these things anyway, and if we do, everybody wins.

“Gangs are never goin’ to die out. You all goin’ to get us jobs?” – Black youth in Los Angeles.

The rapid transition to a low-carbon economy is not only vital for climate protection and human security, but will deliver many and varied employment opportunities for all levels of society. This brings environmental protection into the daily lives of many more people than is currently the case. If a society has a large percentage of the population connected to environmentally-friendly products and services directly through jobs, they become more aware and more active stakeholders. This improves the conditions for making the popular mandate necessary for passing effective environmental legislation, and spurring positive behavioural change.

People can access the low-carbon sector via anything from driving, building and planting, to administration, financial and legal work, to journalism, design, research and engineering. The greening of existing jobs and the creation of many new green jobs is already a multi-billion dollar global reality. Ultimately, all jobs should be green.

Green-collar jobs have become a major issue in US politics, as the nation attempts to address the realities of environmental, economic and financial crises. While they had been held back by a regressive federal administration for many years, the focus on green jobs is now increasing rapidly, due to efforts at state and municipal level, as well as those of many non-profit initiatives, trade unions and partnerships. Under the leadership of President Barack Obama, the ‘green economy’ has been identified as a key strategy for restarting stalled industrial production, saving and re-visioning failing industries, securing energy supplies and protecting the environment. His economic stimulus package contains many billions of dollars for green industries and measures (as detailed below).
Over the past three decades, several European countries have been quietly moving ahead with a transition in their economies, mainly in renewables and energy efficiency. Studies come mostly from Germany, which has forged ahead in these areas, but countries such as Denmark, Sweden and the other Scandinavian nations have excelled in introducing renewable energy generation, insulation, heating and more efficient building design.

The green jobs agenda is one of the most important in the environmental and social justice movements. It unites people with responsibility and opportunity. It can attract votes, customers and employees. It can provide first steps on the employment ladder, and offers plenty of career advancement opportunities. It will become increasingly leveraged in efforts toward finally generating real momentum towards true sustainability.

This chapter will look at definitions, the spread of opportunities in the sector, projected growth, drivers and barriers. Although not a long-established area of investigation, there are now a number of very solid studies carried out at different levels to understand this field and advocate its advancement. This chapter draws from this excellent material.

**What is a green-collar job?**

‘Green Collar’ as a term arrived via a 1976 Congressional hearing in the US, when Professor Patrick Heffernan delivered a paper entitled *Jobs for the Environment – The Coming Green Collar Revolution*. Since then the term had mostly lain dormant. However, in the last few years many individuals and groups in the US have been developing this approach. They have made the positive economic opportunities explicit, successfully describing the links between economy and environment and between poverty and pollution, and comprehensively dispelled the myth that environmental protection can only come at a cost to the national budget. This was the logic voiced by the federal administration under President Bush when defending their decision not to sign up to the Kyoto protocol. The opposite is true, when decisions are made to prioritize green growth at the national level. The renewable energy industry alone has comprehensively demonstrated this.

Green-collar jobs can cover many sectors, from low to high skill levels. They are not necessarily brand new types of jobs, but can be ‘greener’ versions of existing job types, such as in research and development, or manufacturing and agriculture, with associated support staff and service sector positions. These jobs are all directly associated with addressing the vast panoply of environmental issues around the world, including food, water, ecosystems, energy, manufacturing, transport, buildings and waste.

“...the burgeoning industry is claiming scores of experienced workers who can put to use the skills they've acquired in more established fields such as construction, finance, and marketing. In some cases, the high demand for green career-changers translates into a larger paycheck. But more often, the satisfaction of making a positive difference in the world is enough of a boost.”

The definition of a ‘green-collar job’ has been interpreted in slightly different ways. A major report by UNEP suggests that defining green jobs is a matter of defining a green economy. In other words, how green can a job be in a dirty economy? Could the greening of transport fuels make a driver’s job greener, for example? The authors talk of ‘shades of green’:
A green economy is an economy that values nature and people and creates decent, well-paying jobs. Technological and systemic choices offer varying degrees of environmental benefit and different types of employment. Pollution prevention has different implications than pollution control, as does climate mitigation compared with adaptation, efficient buildings vis-à-vis retrofits; or public transit versus fuel-efficient automobiles. It is of course preferable that the most efficient, least polluting options receive priority. But these are not either-or choices, as all of these options are needed to bring about a more sustainable, low-carbon economy. But they do suggest ‘shades of green’ in employment. Greater efficiency in the use of energy, water, and materials is a core objective. The critical question is where to draw the line between efficient and inefficient practices. A low threshold will define a greater number of jobs as green, but may yield an illusion of progress. In the light of the need to dramatically reduce humanity’s environmental footprint, the bar needs to be set high – best available technology and best practices internationally should be seen as the most appropriate thresholds. And, given technological progress and the urgent need for improvement, the dividing line between efficient and inefficient must rise over time. Hence, ‘green jobs’ is a relative and highly dynamic concept.

In his highly recommended book on the subject, US green economy campaigner and author Van Jones defines a green-collar job as “a family-supporting career-track job that directly contributes to preserving or enhancing environmental quality.” He sets out three core principles which define a green economy: equal protection for all, equal opportunity for all and reverence for all creation. He has been instrumental in campaigning for green jobs, and extending the dimensions of what they can achieve.

In reports from the US, the language of description is often strong in terms of its equal opportunity arguments. Advocates draw attention to the fact that low-income workers can find attractive, meaningful employment in this sector, due to low barriers to entry and career prospects in an expanding sector.
The project relies on time given by volunteers, who can come from many backgrounds, including ‘marginalized groups’ such as the long-term unemployed, those with substance abuse problems, those with learning difficulties or mental illness. The Project offers them an inclusive, sociable and practical environment in which they can gain work experience, skills and confidence to help better their personal situation.

The project is self-financing, and supports four full-time staff, some of whom started as volunteers themselves. They have created work and training opportunities for dozens of volunteers, entirely without grant funding. Bristol City Council supports the initiative by providing land at very low rental rates.

www.bwrp.org.uk

Others are more direct: “Put simply, if a job improves the environment, but doesn’t provide a family-supporting wage or a career ladder to move low-income workers into higher-skilled occupations, it is not a green-collar job. Such would be the case with workers installing solar...”


GREEN AND DECENT JOBS? A SCHEMATIC OVERVIEW

GREEN BUT NOT DECENT Examples:
- Electronics recycling without adequate occupational safety
- Low-wage installers of solar panels
- Exploited biofuels plantation day labourers

GREEN AND DECENT Examples:
- Unionized wind and solar power jobs
- Green architects
- Well-paid public transit employees

NEITHER GREEN NOR DECENT Examples:
- Coal mining with adequate safety
- Women workers in the cut flower industry in Africa and Latin America
- Hog slaughterhouse workers

DECENT BUT NOT GREEN Examples:
- Unionized car manufacturing workers
- Chemical engineers
- Airline pilots

panels without job security or proper training, or young people pushing brooms at a green building site without opportunity for training or advancement."

So, while there is as yet no universally agreed definition in existing studies, there are several common features. Broadly, people exploring this area consider green-collar jobs to be those which:

- are related to environmentally friendly products and services
- are relevant to all education and skill levels
- provide a living wage and health benefits
- offer career development
- are often locally based

The range of green-collar jobs

Green jobs can fall into many categories. Technical, highly-skilled positions in research and development (R&D), engineering and manufacturing are only one part of the chain. In renewable energy, for example, investors do a great deal of work to develop a project; environmental impact assessments (EIAs) and consultations may be necessary before installations can be approved; the financial sector helps facilitate projects; legal and administrative support is essential; professionals are required to install the technologies, connect them to the grid and maintain them; policy work is vital to enable market development; civil servants develop legislation and other facilitating measures; independent standards agencies oversee industry and government behaviour; and media and advertising are used by all with related products and services.

As the green sector develops, many people will find jobs within it through various entry points. There are voluntary and entry level positions, some offering on-the-job training; people can transfer skills from another profession, they can retrain specifically, or take courses of study. While it is highly competitive already, there are many openings.

MOVING IN TO THE GREEN-COLLAR SECTOR

Ben Cartland, Acre Resources Ltd

Your first step is to find out how your experience is relevant to the ‘green space’. Which elements of the green sector would most benefit from your previous experience – whether the NGO, charity, public or corporate arenas? Many of the most senior green-collar executives are career switchers themselves – highlighting the most common route for people wanting to make the move. In the vast majority of cases, people will move into the sector within their organizations (rather than quitting to find a new job in this space). If you work in a large company, the chances are that green-related activities are going on somewhere within that structure. By seeking out the decision-makers, being clear about your ambitions and focused on adding value to their work, you should find that they’re open to you helping their work as a small part of your role.

There is a large and growing workforce of highly experienced green professionals out there, and when you apply for the more ‘senior’ positions without an explanation of how your background is relevant, getting through to interview stage will be a challenge. So be sure to identify parts of your former or current experiences which can be relevant to positions, and underline the value in those transferable skills.

Whether you’re a new graduate or a career switcher or community worker, your chances of getting that dream job will be hugely increased by two things – in-depth industry research and networking. Make sure you’ve done your homework – there are lots of resources where
you can start to really understand the different elements to the green landscape and help identify where you’d best fit. One of the great things about the green sector is that most people working in the space are genuinely passionate about what they do, and keen to share their experiences with new entrants into the market. There are lots of conferences, events, and online networking groups that can help you to meet people, make connections and open doors for yourself. For those approaching the sector from a standing start, internships and volunteering can be a good way to build experience and contacts. Most charities encourage volunteers and corporations positively encourage unpaid internships, but do make sure that it’s both relevant to what you want to do, and is focused on an issue that you’re genuinely passionate about.

If you’re sure that a career in the green sector is right for you, then perseverance and dedication will get you where you want to be. There are lots of people who flirt with the idea of the green sector without putting their all into the job search. You need to be committed and focus your time, whilst being realistic about the timescales; you will find that your dedication will win out.

The table below and continued onto the following page gives an idea of the scope of green-collar jobs by sector with specific roles, and opportunities for advancement within them. It is an amalgam of related tables from research in the US. The entry level roles are general, while the advanced ones are more specific. In such fast-developing sectors, this is by no means universal or complete.

<table>
<thead>
<tr>
<th>SECTORS</th>
<th>SUB-SECTORS</th>
<th>ENTRY LEVEL POSITIONS</th>
<th>ADVANCED POSITIONS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Renewable Energy</td>
<td>Solar, Wind, Wave, Tidal, Geothermal and Bioenergy deployment (for biofuels see transport &amp; agriculture) Storage technologies (hydrogen fuel cells, molten salts, pumped storage, batteries etc) Smart grid development</td>
<td>Customer Service Sales Installation, Construction Maintenance Driving</td>
<td>R&amp;D, Journeyman, Solar Electrician Service Technician, Project Manager Construction Managers Environmental Engineers Industrial Production Managers</td>
</tr>
<tr>
<td>Green Building</td>
<td>Efficient windows and lighting, Insulation, Building materials, Hauling and reuse of construction and demolition materials and debris</td>
<td>Construction, Carpentry Demolition Driving</td>
<td>Architect, General Project Manager Contractor</td>
</tr>
<tr>
<td>Water</td>
<td>Water conservation Rainwater harvesting Adaptive grey water reuse</td>
<td>Installation Construction, Maintenance Repair</td>
<td>Journeyman R&amp;D Project Manager</td>
</tr>
<tr>
<td>Transportation</td>
<td>Public transportation, Bicycle supply and repair Energy-efficient cars, More fuel-efficient vehicles Hybrid-electric, electric, and fuel cell vehicles Car sharing, Non-motorized transport Reducing distance and dependence on motorized transport, Biofuels production</td>
<td>Dispatch, Assembly Finishing and repair Biofuel production Distribution driving Maintenance, Electrics Engineering, Purchasing</td>
<td>R&amp;D, Shop manager, Production manager Biofuels research, Head mechanic, Civil engineers, Transportation supervisors Computer software engineers Chemists, Chemical engineers Chemical technicians</td>
</tr>
<tr>
<td>Agriculture &amp; Horticulture</td>
<td>Biofuels production, Urban agriculture Farmers’ markets, Specialty foods production Baking, Soil conservation, Water efficiency, Organic growing methods, Reducing farms-to-market distance Green (sustainable) landscaping Tree-cutting and pruning Peri-urban and urban agriculture Parks and open space landscaping</td>
<td>Biofuel growing and refining Growing, Packaging Delivery, Selling Set-up/tear-down Brewing, Roasting, Packaging Baking, Mixing, Cleaning Planting, Maintenance Tree surgery/pruning</td>
<td>R&amp;D Production manager Market manager Floor manager Head baker Project manager Landscape architect Head gardener</td>
</tr>
</tbody>
</table>
Renewables and efficiency job creation

Renewable energy and energy efficiency have so far been two of the greatest job-creating sectors. An impressive list of facts and figures from the US and Germany shows the kind of economic and employment opportunities that are already being seized in these areas, and how this could expand in the future. According to the American Solar Energy Society, in their 2008 report Defining, Estimating, and Forecasting the Renewable Energy and Energy Efficiency Industries in the US and in Colorado, the US has a huge industry in renewables and efficiency already, and this could grow enormously in the coming years with the right incentives:

We found that, in 2007, the US RE&EE industries generated $1,045 billion in sales and created over 9 million jobs – including $10.3 billion in sales and over 91,000 jobs in Colorado. The US RE&EE revenues represent substantially more than the combined 2007 sales of the three largest US corporations – Wal-Mart, ExxonMobil, and GM ($905 billion). RE&EE are growing faster than the US average and contain some of the most rapidly growing industries in the world, such as wind, photovoltaics, fuel cells, recycling / remanufacturing, and biofuels. With appropriate federal and state government policies, RE&EE could by 2030 generate over 37 million jobs per year in the US...7

ASES's oft-quoted report on renewables for 2007 – Renewable Energy and Energy Efficiency: Economic Drivers for the 21st Century – forecast that by 2030 as many as 1 out of 4 workers (40 million people) in the US will be working in renewable energy and energy efficiency industries which will be worth up to $4.5 trillion in revenue in the US, with the appropriate
public policies in place. They claim that these industries already generate nearly $1 trillion in revenue, contributing more than $150 billion in tax revenues.\(^8\)

Kammen et al, in a 2004 study on job creation from renewables, found that, per unit of delivered energy, the renewables industry provides more jobs than the fossil-fuel industry. Further, they suggest it is the comprehensiveness and coordination of energy policy that yields the biggest combined rewards for the various sectors.\(^9\)

Germany has been an international beacon in terms of renewable energy job creation since the early 1990s, with a very active Federal Environment Ministry providing annual figures on these and other benefits of renewable energy.\(^10\) Their spring 2009 press release summarizes the usual impressive data on the previous year’s growth:

Renewable energies once again proved their importance for growth and employment last year. According to the latest figures, the number of employees in this sector rose from 250,000 in 2007 to almost 280,000 – an increase of more than 10 percent. The reason: strongly increasing domestic turnover of around €30 billion in 2008 and a significant rise in the renewables’ share in electricity and heat production. According to provisional estimates by the Working Group on Renewable Energies Statistics (AGEE-Stat), renewables enable savings of roughly 115 million tonnes of climate-damaging CO\(_2\) per year in Germany – 57 million tonnes as a result of the Renewable Energy Sources Act (EEG) alone. With a share of around 10 percent in final energy consumption, renewables have further strengthened their role as a key pillar of sustainable energy supply. They have a share of 14.8 percent in gross electricity consumption and 7.7 percent in heat supply. In 2008 the renewables sector recorded a significant increase in turnover. Total investments and revenues from plant operations rose last year to around €30 billion – almost 4.5 billion more than in the previous year. With almost €13 billion, investments in plant construction were almost 20 percent above the previous year’s figure.\(^11\)

At the time of writing the economic downturn has not impacted the sector too significantly. Some job losses and bankruptcies have occurred, but oversupply has created a buyer’s market, and whilst credit, finance and investment have taken a hit, the appetite for projects is still growing broadly in line with the industry trends of the last decade or so. Their guaranteed payments for renewable electricity generation through the feed-in tariff (see Chapter 3) have a major part to play in sustaining industry confidence.

Policy drivers

Some governments, national and local, have made great progress with environmentally-friendly laws and policies. Some companies are
ahead of the curve in spotting opportunities presented by the need to address climate change and environmental damage, and to deal with fair trade issues, for example. Many members of the world’s voting and shopping public are responding to the push and pull factors from government and business which are helping them to make greener lifestyle choices. All three groups influence one another, and are in turn influenced by energy costs. Getting away from fossil-fuel use is becoming easier as we learn from one another, and as new alternatives are developed. The rewards are immense, and first movers are securing valuable market share and supply chains. They are also future-proofing their country’s economies and company’s finances, and creating sustainable employment as a result.

These are some of the driving factors in producing changes in the world’s economies. Green markets are growing as a result, and at present are estimated at €1,000 billion, with a projected ~€2,200 billion by 2020:

### Green sectors, and present and future values

<table>
<thead>
<tr>
<th>Sector</th>
<th>Present</th>
<th>Future by 2020</th>
</tr>
</thead>
<tbody>
<tr>
<td>Energy efficiency technologies</td>
<td>€450 billion</td>
<td>€900 billion</td>
</tr>
<tr>
<td>Waste management/recycling</td>
<td>€30 billion</td>
<td>€46 billion</td>
</tr>
<tr>
<td>Water supply/sanitation/water efficiency</td>
<td>€185 billion</td>
<td>€480 billion</td>
</tr>
<tr>
<td>Sustainable transport</td>
<td>€180 billion</td>
<td>€360 billion</td>
</tr>
</tbody>
</table>

Policy drivers have been perhaps most apparent in renewables and recycling, but are becoming increasingly visible in many other key areas, including energy efficiency, manufacturing, waste, buildings and transport:

- Energy efficiency retrofits (government-funded schemes, mandates)
- Public and private sector green procurement (mandates for purchasing eco-friendly products and services)
- Ecolabelling (guiding purchasing choices by creating standards)
- Extended Producer Responsibility (product take-back, reuse and recycling laws)
- Recycling and anti-landfill mandates (e.g. obligations upon local authorities)
- Green Building standards (e.g. UK’s Zero Carbon Homes by 2016 policy)
- Sustainable transport (walking and cycling promotion, alternative fuel mandates, tram or bus rapid transit systems)

Feed-in tariffs, also known as Renewable Energy Payments (REPs) in the US, are by far the biggest job creation policy driver in renewable energy, and this growth will snowball as more and more interests see how proliferation of new energy systems can create new markets, such as electric vehicles, energy storage technologies and smart grids (see page 77), creating a self-reinforcing positive feedback (see pages 89-91). In Canada the province of Ontario is moving toward a FIT, with Deputy Premier George Smitherman announcing that it could generate over 50,000 new jobs within three years. In the US state of Michigan, also home to a dying automotive industry, they have been exploring how a FIT could revive their manufacturing economy. Many other North American states and provinces have been doing likewise.

As stated above, the German feed-in tariff for renewable energy (see Chapter 3) has helped to create well over a quarter of a million jobs and a world-beating industry with an annual turnover...
of nearly €25 billion per year, in less than twenty years. The United States, Germany, Spain, India and China are among the most attractive countries to invest in for renewables, due largely to their determination and the establishment of proactive support schemes. All of these countries have corresponding domestic manufacturing and supply capacity, producing many hundreds of thousands of direct and indirect jobs between them.

Green jobs have, somewhat controversially, also been created by incentives such as the Clean Development Mechanism (CDM), one of the Kyoto Protocol’s market mechanisms (see Chapter 4). Despite much criticism of the system, over 1,000 renewable energy projects have been put in place in developing countries, and the system appears likely to continue into the new post-Kyoto climate agreement, mainly as it has helped create a new market in tradeable certificates.

Public sector procurement is another way of boosting the green products and services sector. The European Union produced the Buying Green Handbook to help guide the thinking of public authorities:

*Public authorities are major consumers in Europe, spending some 16% of the EU’s gross domestic product (which is a sum equivalent to half the GDP of Germany). By using their purchasing power to opt for goods and services that also respect the environment, they can make an important contribution towards sustainable development. Green public procurement covers areas such as the purchase of energy-efficient computers and buildings, office equipment made of environmentally sustainable timber, recyclable paper, electric cars, environment-friendly public transport, organic food in canteens, electricity stemming from renewable energy sources, and air conditioning systems complying with state-of-the-art environmental solutions.*

Energy efficiency policies are required, just as with renewable energy, to boost the market development for efficiency products and services. The CERT (Carbon Emission Reduction Target) system in the UK puts an obligation on energy suppliers to achieve targets for promoting reductions in carbon emissions in the household sector. Suppliers must direct at least 40% of carbon savings to a priority group

*Installing loft insulation.*
of low-income and elderly consumers. During its existence, from April 2008 to 2011, the programme is expected to deliver overall lifetime carbon dioxide savings of 154 MtCO\(_2\) – equivalent to annual net savings of 4.2 MtCO\(_2\) by 2010, and equivalent to the emissions from 700,000 homes each year. It is further estimated to stimulate around £2.8 billion of investment by energy suppliers in carbon reduction measures.\(^{15}\) Such policy-driven activity means jobs in various roles throughout the supply chain.

However, after the cheap measures are used, such as loft and cavity wall insulation and low-energy lightbulbs, how can more expensive measures be promoted, especially those dealing with single-skin brick buildings which have no cavities to insulate? The technologies themselves must be both available and affordable, and policy directives must be created to achieve this. Furthermore, energy companies and government are often mistrusted, which is why local authorities, community groups and other organizations are required to communicate with the public to encourage the take-up of additional efficiency measures. The Energy Sufficiency chapter contains further examples of new options.

A report by the UK Association for the Conservation of Energy concludes: “Though job creation was not the primary stated aim for any of the programmes studied here, the case studies and modelling exercises found that employment gains have been an indirect consequence in virtually every case. Macro-economic modelling suggests that where countries unilaterally initiate energy efficiency programmes there can be some job losses at the EU level in the short term. However, at the national level negative outcomes are very rare in terms of employment, and in the longer term the outcome is always positive.”\(^{16}\)

A carbon tax, preferably a revenue-neutral one, could help to internalize the costs of fossil-fuel use – both in production and consumption. Hybrid systems with cap-and-trade systems are recommended as the cheapest way to introduce such measures. This sets a limit on the level or quantity of GHG emissions, issues permits equalling that quantity, and allows trading of the permits among entities who emit greenhouse gases. This creates a market for greenhouse gas reductions, and thus a direct monetary cost for GHG emissions.\(^{17}\) Such a development could massively increase the economic attractiveness of renewables and efficiency measures, and hence boost those sectors dramatically.

**Business drivers**

Beyond these national and international policies, there are the innovators in business who are willing to go the extra mile first, helping to capture market share and set standards. Interface Carpets is a leading example, and their mission statement exemplifies this:

“**Innovative policies can move the transition to sustainability forward at a much faster pace. Governments must establish an ambitious and clear policy framework to reward, support, and drive sustainable economic and social activity . . . this means a decisive and urgent shift in government policy at the global as well as national and local levels with regard to subsidy and tax policy, adequate financing flows and mechanisms, scaling up of promising projects and ventures, sharing of green technologies and relevant information, and replicating both successful regulations and incentives and best industry practices. With progress on these fronts, millions of new green jobs can indeed be generated in coming years.”**

**UNEP, 2007, p.xiii**
We will strive to create an organization wherein all people are accorded unconditional respect and dignity. We will honor the places where we do business by endeavoring to become the first name in industrial ecology, a corporation that cherishes nature and restores the environment. Interface will lead by example and validate by results, including profits, leaving the world a better place than when we began, and we will be restorative through the power of our influence in the world.

It is clear that outdated, business-as-usual attitudes will not prevail in the changing market place. General Motors has seen a precipitous decline in its market share, while more forward-looking companies such as Toyota and Honda, who are making hybrid petrol-electric vehicles a common sight on US roads, have enjoyed rises in theirs. That said, UNEP research suggests that the profile for innovation is small to medium-term enterprises who favour employees with problem-solving skills and personal initiative.

At the local level, Professor Raquel Pinderhughes’ research on green jobs in the Bay Area of San Francisco showed that green businesses require support to flourish, especially in terms of adequate, appropriate, affordable space and a general stimulation of the sector to make them more viable and numerous. For the latter she recommends providing (a) procurement dollars and contracts to purchase goods and services that local green businesses provide; (b) assistance with marketing; (c) access to capital; and (d) technical assistance.

The Green-Collar Economy

goals, and assess local and regional opportunities for achieving those goals.
2. Enact policies and programmes to drive investment into targeted green economic activity and increase demand for local green-collar workers.
3. Prepare your green-collar workforce by building green-collar job training partnerships to identify and meet workforce training needs, and by creating green pathways out of poverty that focus on recruitment, job readiness, job training, and job placement for low-income residents.
4. Leverage your programme’s success to build political support for new and bolder policies and initiatives.

Green New Deals

As the global economic recession has tightened up private sector investment, a major cash injection has come to green markets by way of various ‘Green New Deals’. The term has been used by many groups to promote the idea of boosting economic recovery through government spending, as US President Franklin D. Roosevelt did during the great depression of the 1930s. The New Deal was a sequence of central economic planning and economic stimulus programmes initiated between 1933 and 1938, with the goals of giving work relief to the unemployed, reforming business and financial practices, and initiating an economic recovery.

The New Economics Foundation (nef) in the UK, a think-and-do tank, came up with one of the first Green New Deal proposals in July 2008. It was “a response to the credit crunch and wider energy and food crises, and to the lack of comprehensive, joined-up action from politicians”. It calls for massive investment in renewable energy and wider environmental transformation in the UK, leading to the creation of thousands of new
green-collar jobs; reining in reckless aspects of the finance sector – but making low-cost capital available to fund the UK’s green economic shift; and building a new alliance between environmentalists, industry, agriculture and unions to put the interests of the real economy ahead of those of footloose finance.\textsuperscript{21}

UNEP released a joint statement advocating similar approaches in October 2008. They espouse the ‘double-dividend’ economic and environmental benefits of funding building retrofitting, sustainable infrastructure and green jobs policies. The intended outcomes are as follows:

- Immediate economic stimulus and job creation, in particular through investments in retrofitting buildings;
- Longer-term steady generation of economic activity and job creation through infrastructure investments;
- Preparation for a low-emission future by reducing greenhouse gas emissions, improving energy efficiency and using our water resources more wisely;
- Promotion of export-competitive green industries and green-collar jobs; and
- Assistance to low-income and other vulnerable households to cope with economic uncertainty, housing affordability and fuel and electricity price volatility.\textsuperscript{22}

The UNEP final report of February 2009 on a Green New Deal advocates a mix of policies and incentives which should not only restart the global economy but improve its sustainability. Crucially, they highlight the need for an ‘expanded vision’ which takes in key global challenges such as water, ecosystems health, carbon dependency and poverty.\textsuperscript{23}

The \textit{Financial Times} published details of the economic stimulus packages introduced by various countries and regions in 2009, detailing the amounts pledged for green measures:

<table>
<thead>
<tr>
<th>COUNTRY / REGION</th>
<th>Stimulus ($ billion)</th>
<th>Green portion</th>
<th>Green percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Australia</td>
<td>26.7</td>
<td>2.5</td>
<td>9</td>
</tr>
<tr>
<td>Canada</td>
<td>31.8</td>
<td>2.6</td>
<td>8</td>
</tr>
<tr>
<td>China</td>
<td>586.1</td>
<td>221.3</td>
<td>38</td>
</tr>
<tr>
<td>EU</td>
<td>38.8</td>
<td>22.8</td>
<td>59</td>
</tr>
<tr>
<td>France</td>
<td>33.7</td>
<td>7.1</td>
<td>21</td>
</tr>
<tr>
<td>Germany</td>
<td>104.8</td>
<td>13.8</td>
<td>13</td>
</tr>
<tr>
<td>Italy</td>
<td>103.5</td>
<td>1.3</td>
<td>1</td>
</tr>
<tr>
<td>Japan</td>
<td>485.9</td>
<td>12.4</td>
<td>3</td>
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<tr>
<td>South Korea</td>
<td>38.1</td>
<td>30.7</td>
<td>81</td>
</tr>
<tr>
<td>UK</td>
<td>30.4</td>
<td>2.1</td>
<td>7</td>
</tr>
<tr>
<td>US</td>
<td>972.0</td>
<td>112.3</td>
<td>12</td>
</tr>
</tbody>
</table>

Source: adapted from Financial Times, \textit{Which country has the greenest bail-out?}\textsuperscript{24}

The US Green Jobs Act of 2007 (H.R. 2847), introduced by Reps. Hilda Solis (D-CA) and John Tierney (D-MA), authorized up to $125 million in funding to establish national and state job training programmes to help address skills shortages that threaten to slow growth in green industries. The Green Jobs Act was signed into law in December 2007, but it was not until the new administration passed the American Recovery and Reinvestment Act in 2009 that the funds were actually made available to meet the goals. The Act provides funding for green sectors such as renewable energy, energy efficiency, electricity grid infrastructure and transport. This is as forceful a statement of intent as we have seen in getting to grips with greening a national economy.
The UNEP Green Jobs report makes an excellent assessment of the conditions militating against the growth of green jobs, which is worth reproducing in full:

... the encouraging growth of green jobs needs to be viewed against the sheer enormity of the tasks facing human society in terms of achieving a truly sustainable, low-carbon, and more equitable world. A number of inescapable realities need to be addressed: 

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<table>
<thead>
<tr>
<th>Amount</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>$4 billion</td>
<td>For job training with focus on green-collar job training</td>
</tr>
<tr>
<td>$32 billion</td>
<td>To transform the nation’s energy transmission, distribution, and production systems by allowing for a smarter and better grid and focusing investment in renewable technology</td>
</tr>
<tr>
<td>$11 billion</td>
<td>Reliable, efficient electricity grid</td>
</tr>
<tr>
<td>$6 billion</td>
<td>To weatherize modest-income homes</td>
</tr>
<tr>
<td>$31 billion</td>
<td>To modernize federal and other public infrastructure with investments that lead to long-term energy cost savings</td>
</tr>
<tr>
<td>$20 billion</td>
<td>To local school districts through new School Modernization and Repair Program to increase energy efficiency</td>
</tr>
<tr>
<td>$16 billion</td>
<td>To repair public housing and make key energy efficiency retrofits</td>
</tr>
<tr>
<td>$1 billion</td>
<td>Public Housing Capital Fund for projects that improve energy efficiency</td>
</tr>
<tr>
<td>$1.5 billion</td>
<td>HOME Investment Partnerships to help local communities build and rehabilitate low-income housing using green technologies</td>
</tr>
<tr>
<td>$6 billion</td>
<td>GSA Federal Buildings for renovations and repairs to federal buildings to increase energy efficiency and conservation</td>
</tr>
<tr>
<td>$6.9 billion</td>
<td>Local Government Energy Efficiency Block Grants to help state and local governments become energy-efficient and reduce carbon emissions</td>
</tr>
<tr>
<td>$2.5 billion</td>
<td>Energy Efficiency Housing Retrofits for a new programme to upgrade HUD sponsored low-income housing to increase energy efficiency</td>
</tr>
<tr>
<td>$2 billion</td>
<td>Energy Efficiency and Renewable Energy Research for development, demonstration, and deployment activities to foster energy independence, reduce carbon emissions, and cut utility bills</td>
</tr>
<tr>
<td>$500 million</td>
<td>For advanced energy-efficient manufacturing</td>
</tr>
<tr>
<td>$1.5 billion</td>
<td>Energy Efficiency Grants and Loans for Institutions for energy sustainability and efficiency grants to school districts, institutes of higher education, local governments, and municipal utilities</td>
</tr>
<tr>
<td>$500 million</td>
<td>Industrial Energy Efficiency for energy-efficient manufacturing demonstration projects</td>
</tr>
<tr>
<td>$10 billion</td>
<td>For transit and rail to reduce traffic congestion and gas consumption</td>
</tr>
<tr>
<td>$2 billion</td>
<td>Advanced Battery Loans and Grants to support US manufacturers of advanced vehicle batteries and battery systems</td>
</tr>
<tr>
<td>$1.1 billion</td>
<td>Amtrak and Intercity Passenger Rail Construction Grants</td>
</tr>
<tr>
<td>$200 million</td>
<td>Electric Transportation for a new grant programme to encourage electric vehicle technologies</td>
</tr>
<tr>
<td>$2 billion</td>
<td>To support advanced battery development</td>
</tr>
<tr>
<td>$2.4 billion</td>
<td>For carbon sequestration research and demonstration projects</td>
</tr>
<tr>
<td>$1.85 billion</td>
<td>For various clean energy projects to promote energy smart appliances, assist states and GSA to convert fleets to more efficient vehicles, electric vehicle technology research, developing renewable energy for military use</td>
</tr>
<tr>
<td>$400 million</td>
<td>Alternative Buses and Trucks to state and local governments to purchase efficient alternative fuel vehicles</td>
</tr>
<tr>
<td>$8 billion</td>
<td>Renewable Energy Loan Guarantees for alternative energy power generation and transmission projects</td>
</tr>
<tr>
<td>$350 million</td>
<td>Department of Defense Research into using renewable energy to power weapons systems and military bases</td>
</tr>
<tr>
<td>$2.4 billion</td>
<td>Cleaning Fossil Energy for carbon capture and sequestration technology demonstration projects</td>
</tr>
<tr>
<td>$400 million</td>
<td>For NASA climate change research</td>
</tr>
</tbody>
</table>
1. Green jobs are simply not growing rapidly enough. As the Stern Review points out, overall investment in green technologies remains inadequate, notwithstanding the very strong growth in renewable energy. Carbon markets (along with the necessary institutions and networks of climate cooperation) may eventually make an important contribution to financing green development, but for now are still on a distant horizon.

2. Green employment has gained an important foothold in the developed world, but with the major exception of China and Brazil, it is still quite exceptional in most developing countries. Yet these are the countries that account for some 80 percent of the world’s workforce.

3. We see the emergence of green jobs inside a global labour market still largely driven by conventional job creation. The rising level of informality in the global economy constitutes a major challenge to green job growth. Moreover, the chronic and worsening levels of inequality both within and between countries are a major impediment. The effort to advance decent work and pro-poor sustainable development is critical to building green jobs across the developing world in particular.

4. Unsustainable business practices are still quite prevalent and often remain more profitable. Short-term pressures of shareholders and financial markets are not easily overcome. The early adopters of green business practices have to contend with companies that can command consumer loyalty through low prices (on the back of ‘externalized’ costs). And surprisingly often, market failures, coupled with lack of green knowledge, impede action.

   . . . These do not have to be insurmountable obstacles. Innovative policies can move the transition to sustainability forward at a much faster pace. Governments must establish an ambitious and clear policy framework to reward, support and drive sustainable economic and social activity and be prepared to confront those whose business practices continue to pose a serious threat to a sustainable future. This means a decisive and urgent shift in government policy at the global as well as national and local levels with regard to subsidy and tax policy, adequate financing flows and mechanisms, scaling up of promising projects and ventures, sharing of green technologies and relevant information, and replicating both successful regulations and incentives and best industry practices. With progress on these fronts, millions of new green jobs can indeed be generated in coming years.26

Pinderhughes makes the following points on impediments to more green growth: “Most firms are not adequately prepared to address the work force development issues that will accompany rapid growth. Seventy-three percent of the business owners/managers surveyed stated that there was a shortage of qualified green-collar workers for their sector, with the greatest needs in energy, green building, mechanics and bike repair.”27
As above, parts of the new green economy plans in the US are aimed at addressing such skills shortages. The longer-term growth of green markets will depend to an extent on confidence in the relevant industries and services, which means that qualified and trained professionals are vital. Without such people, the technologies cannot be put to use in great numbers, and the development of economies of scale are held back. Furthermore, green technologies must come down in price quickly to be a viable alternative for consumers.

Conclusions

Given that a clean environment and a sustainable global economy are vital and non-negotiable for life on earth – yet have hitherto been politically unattainable – what can green job creation do to leverage public support for societal, economic, climate and environment-protecting measures? Despite it being an emerging area of practice and study, it is clear that green jobs and the green economy agenda are central to finally gaining momentum with the interlinked energy and environment issues – and can do so on the back of the precarious global economic situation. Longer-term, it is arguably the most likely route to the successful development of both bottom-up and top-down engagement with environmental protection in society. By attaching other concepts which directly involve citizens, such as participatory budgeting and feed-in tariffs, it can help provide positive momentum in which government, business and society can move together. This synergy will be necessary in order to create a critical mass that reshapes global society in a sustainable way. Green job creation is about embedding this thinking in economic reality, creating a common goal, and ensuring buy-in from all relevant stakeholders. A new, transformative wave washing over the world’s economies, building on successful developments in countries around the world such as Germany, Spain, China, Japan and the US, can bring many people into these sectors and unleash human creativity upon this transition.

Green jobs will need to be carefully monitored and studied, in order to build an accurate and useful picture of the development of this sector. Government, trade unions and business associations should monitor direct and indirect job creation, and its demographic spread. Sooner rather than later, green job creation should be a standard aim of any employer, and policies should be in place to assure that this is so.

A carbon-constrained world will generate ongoing legislative, market and behavioural responses which will in turn lead to green job creation. Energy, transport, waste and building sectors are foremost in attracting investment, as outlined above, but many other sectors will also benefit. From manufacturing processes to food and energy production, these changes are all about minimizing inputs and losses – creating an efficient, less fossil-fuel-dependent economy. In nature, efficient design and behaviour is an iron law of survival, and one we must learn well in the coming decades. Creating efficient infrastructure and processes, for ourselves and future generations, is top of this century’s ‘things to do’ list. The renewable energy transition, and climate change mitigation and adaptation more broadly, will provide many new roles, and in great numbers – both in the developed and the developing world. In the end, all jobs have to be green jobs. All activities must ultimately conserve, protect and enhance the environment and the world that future generations will inherit. In other words, green jobs are a central part of not only potential prosperity, but potential survival also.
For the growth of the green-collar economy, several factors are critical:

- **Policy drivers** such as carbon taxes, renewable energy and energy efficiency targets, ecolabelling, green procurement mandates, extended producer responsibility, recycling mandates, green building standards, sustainable transport, and economic stimulus packages.

- Anyone must be able to access the green sector and gain a safe and decent job with longer-term career prospects.

- Training programmes in the green sector are essential; a major barrier to a rapid greening of the economy is the lack of a trained workforce.

- Unsustainable policies and practices, and perverse subsidies need to be removed if the economy is to move in a greener direction.

Acknowledgements

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*Ben Castle* Energy Savings Trust
The point is this. When you think about the emerging green economy, don’t think of George Jetson with a jet pack. Think of Joe Sixpack with a hard hat and lunch bucket, sleeves rolled up, going off to fix America. Think of Rosie the Riveter, manufacturing parts for hybrid buses or wind turbines. Those images will represent the true face of a green-collar America.

If we are going to beat global warming, we are going to have to weatherize millions of buildings, install millions of solar panels, manufacture millions of wind-turbine parts, plant and care for millions of trees, build millions of plug-in hybrid vehicles, and construct thousands of solar farms, wind farms, and wave farms. That will require thousands of contracts and millions of jobs – producing billions of dollars of economic stimulus.

Van Jones, from The Green Collar Economy – How one solution can fix our two biggest problems