Retraining workers for the green economy

Introduction

The following report will try to analyse the impact of green policies and Greenhouse Gas (GHG) reductions on employment. After trying to assess the impact of the increasing importance of the eco-industry on current jobs, the report will describe the likely outcomes. The research will try to define the existence and the scope of the so-called 'green skills' and it will list the ones that appear to be most required by the market. Most importantly it will try to inquire over how to manage the transition to a green economy avoiding or containing job losses through retraining of workers and repurposing of old skills to fit the needs of the growing eco-industry. Although research about green skills is moving only its first steps and information about workers' transition to low-carbon job paths is scarce the report will try to outline the "state of the art". Eventually it will consider some success stories in the United States and in Europe.

Starting from the evidence of massive public investments in the renewable energy production and the increasing caps on GHG emissions, the report will take account of the document produced by the United Nations Environment Program (UNEP), *Green Jobs: Towards Decent Work in a Sustainable, Low Carbon World* (2008) and the final report of the ECORYS for the European Commission DG Environment, *Environment and Labour Force Skills – Overview of the links between the Skills Profile of the Labour Force and Environmental Factors* (2008). Other important references are the ETUC report *Climate Change and Employment* (2007), the paper of the Green European Foundation *The European Green Collar Economy* (2009) and the results of the Cedefop workshop *The New Green Skills: not just for Eco-Industry* (2008).

Also some Internet sources have been consulted, especially for what concerns the information about the United States: the most important ones are the Washington-based organization "Go Verde" website and the Portland-based "Sustainable Industries" magazine website.

New investments

With the unemployment rates rising all over the world because of the recent financial crisis governments have passed new legislation in order to provide incentives and subsidies to green businesses and for the re-training of laid-off workers.

According to a 2008 United Nations Environment Programme study, the global environmental goods and services sector is expected to double by 2020 to become a $2.7 billion market[1]. The German government commissioned a study on the current global green-tech market, which ended up being even more optimistic, pointing to a sector value of some $3 trillion and up to around 21

[1] http://www.sustainableindustries.com/greenbuilding/42017582.html?page=1

million jobs until 2020. According to the study, carried by Roland Berger Strategy Consultants, this will become one of the biggest markets in the world[2].
While the recession has dampened hiring and increased layoffs, in the renewable energy and green building sectors insiders seem to remain optimistic about longer-term jobs prospects in the field, especially taking into consideration the massive injections of public funds. For instance, the economic stimulus package signed by the Obama administration on February 2009 includes $71 billion for energy and environmental initiatives and another $20 billion for green tax incentives[3]. The European economic recovery plan in this regard is more modest but it includes "a European green cars initiative with combined funding of at least €5 billion, a European energy-efficient buildings initiative worth €1 billion, and a 'factories of the future' initiative estimated at €1.2 billion"[4]. Also China is jumping into the 'green collar' jobs race, having passed the United States in the number of new wind turbines built in the first half of 2009; in wind power local demand often means local jobs and that is especially true for China where an unofficial rule says all installed turbines must include 70 percent local content[5].

Organizational impact of the greening of the economy

The European Commission communication (COM 2009/400 final) states that "sustainable development is set out in the Treaty as the overarching long-term goal of the EU"[6]. It also specify that "education and training build the critical foundation for sustainable development; the Commission encourages Member States in their efforts to develop more strategic approaches to sharing knowledge and good practice in a bid to stimulate Education for Sustainable Development (ESD)"[7]. Given the importance of this goal the Member States unilaterally agreed to open up a transition to a low-carbon economy, reducing the Greenhouse Gas (GHG) emissions to a range between 15 to 30% by 2020 and from 60 to 80% by 2050, compared to the level of 1990.
It is not yet clear what exactly will be the social and employment impact of this transition, nor it is clear what would be the consequences of global warming on employment. It is very probable that, in the latter case, changes in temperatures and precipitation levels, rising sea levels and changes in the frequency of extreme climatic events will have implications for almost every economic activity. According to the United Nations Environment Programme (UNEP), the costs of inaction would be too high.

> It is worth pausing for a moment to briefly consider the likely employment repercussions of not taking action. In agriculture, animal husbandry, forestry, and fisheries, jobs and livelihoods may be lost as a result of increasing drought, desertification, and climate change. Employment in the tourism industry is feeling the impacts as glaciers recede and ski areas lack snow, or as resorts in warmer zones of the

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[2] http://www.energy-daily.com/reports/Analysis_Green_sector_may_save_economy_999.html
[3] http://environment.about.com/b/2009/02/17/obama-signs-green-economic-stimulus-package.htm
[4]http://europa.eu/rapid/pressReleasesAction.do?reference=IP/08/1771&format=HTML&aged=0&language=EN&guiLanguage=en
[5] http://www.reuters.com/article/wtUSInvestingNews/idUSTRE5753CB20090806
[6] http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=COM:2009:0400:FIN:EN:PDF
[7] *Ibidem*

> planet are affected by shortages of water or the spread of contagious diseases. Jobs in the insurance sector may be endangered as companies are hard hit by rising claims – although on the other hand, there is also a rising need for experts in risk assessment and damage evaluation. Businesses and employment will suffer in the face of more-frequent and powerful storms and flooding, as buildings, production equipment, and infrastructure are damaged or destroyed. Pandemics linked to the spread of infectious diseases in a warming world could affect labour productivity. Jobs in the energy industry will be affected by countervailing trends, as warmer winters reduce the need for heating, yet hotter summers increase demand for cooling (UNEP Green Jobs report, 2008)[8].

In just few words, the social, economic and environmental costs of inaction would be unbearable. Nonetheless a strategy for the transition to a sustainable economy should equally take in consideration the social and employment impact of such a change. The European Commission sustainable development strategy of 2006 urged political leaders and workers' organizations to engage in social dialogue over the medium and long-term policies for a sustainable development. Most importantly, the Commission highlighted the need to identify winners and losers of this transition and undertake a cost-benefit analysis of EU's strategies to tackle climate change, taking account of both environmental and competitive considerations.

Considering the scope of such a challenge, the Commission advocated for the involvement of civil society and the private sector more effectively in the preparation of decision-making[9].

The capacity of businesses and industry to adapt their enterprises to climate change will be a crucial component of a just transition: a 'management challenge' consists in the development of new perspectives, awareness and managerial capacities. According to Susan Helper, professor of economics at Case Western Reserve University in Cleveland, Ohio, new capacities will require a new style of management. Managers must be willing and able to learn new skills and to make use of the skills their subordinates have obtained. Supervisors must be retrained from being disciplinarians to being coaches[10].

Nonetheless, enterprises alone cannot alter their usual way of doing business, as they historically tend to externalize depletion of natural resources as a cost to society, not to them. Moreover, private enterprises are more likely to favor some actions rather than others (i.e. carbon capture rather than fossil fuels reduction), without considering long-term goals and general societal interests[11].

According to the UNEP Green Jobs Report "a just transition will only be true to its name if transition policies are designed and implemented with the active participation of those whose lives they affect: employers, workers, and farmers, ranging from the national level to the local level, on farms, in offices, and on factory floors. […] Social dialogue has occurred at the national level through various tripartite mechanisms involving employers, trade unions, and local bodies. Today, social dialogue happens at the community level and in the

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[8] http://www.unep.org/labour_environment/PDFs/Green-Jobs-Background-paper-18-01-08.pdf

[9] http://ec.europa.eu/sustainable/docs/sec2005_0225_en.pdf

[10] http://www.ilo.org/wcmsp5/groups/public/---dgreports/---dcomm/documents/publication/wcms_098503.pdf

[11] http://www.cedefop.europa.eu/etv/upload/etvnews/news/3800-att1-1-presentation_rigg.pdf

workplace, and in companies that are seeking to reposition themselves to take advantage of green business opportunities: a new form of decision-making arises as decisions are taken and implemented at all levels of society.
A new cooperative approach in industrial relations might be encouraged by the necessity of employers in some developed countries to ensure that the green manufacturing sector is capable of functioning in spite of the high level of deindustrialization while community-based organizations representing low-income populations have promoted the idea that green-collar employment provides a pathway out of poverty for individuals and communities in economically depressed or marginalized areas. Both groups therefore have put their hopes in the emerging eco-industry business.

Emerging green sectors and employment impact

An OECD report defines eco-industry as all 'activities which produce goods and services to measure, prevent, limit, minimize or correct environmental damage to water, air and soil, as well as problems related to waste, noise and eco-systems. This includes technologies, products and services that reduce environmental risk and minimise pollution and resources'[12].
The UNEP report outlines 6 main sectors, which are expected to grow or undergo substantial changes as a result of the greening of the economy:

- Energy supply: growth of renewables and biofuels, use of carbon capture and sequestration and decline of fossil fuel industry;
- Buildings: energy efficiency, green high performance buildings, retrofitting and efficient building components;
- Transportation: railway, urban mass transit, green auto-manufacturing, vehicles retrofitting;
- Basic Industry: secondary steel and aluminium production based on recycled scrap, cement using alternative and recycled content, recycled pulp and paper industry and recycling jobs in general;
- Food and agriculture: organic farming, urban agriculture, sustainable small farming, environmental services and natural resource management, climate change adaptation and mitigation;
- Forestry: afforestation, agroforestry, sustainable forestry management (SFM)[13].

These developments show that not all jobs are equally green and that some are greener than others. For example mass transit is preferable to automobiles and renewable sources are greener than carbon capture and sequestration (as the latter produce toxic waste).
Moreover, all these sectors affect one another in several ways and all together have a great impact on the economy as a whole and virtually on all economic activities. For example, clean energy production means that every economic activity has far less detrimental impact on the environment than today.

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[12] http://www.cirano.qc.ca/pdf/publication/2004s-42.pdf

[13] http://www.unep.org/labour_environment/PDFs/Green-Jobs-Background-paper-18-01-08.pdf

It is important to underline that green jobs are not yet expanding fast enough: while environmental regulation is one of the main drivers of the growth of eco-industry, unsustainable business is still prevalent and remains more profitable than green ways of doing business. It is necessary to internalise the costs of environmental damage and pollution and to prevent new eco-industries to sustain 'unfair' competition with cheaper and environment-unfriendly businesses. In this regard the DG Competition could play a crucial role, preventing the raise of barriers against low-carbon alternatives.
As eco-industry expands, it is crucial to understand how it will affect current employment and elaborate policies for the smoothest possible transition in terms of job losses/transition and skills demand.
According to a report produced by ECORYS for the DG Environment, future employment will be affected by 'green' policies in four ways:

1. Additional jobs will be created in several areas, such as in the manufacturing of pollution-control devices which are added to existing production equipment;
2. Substitution of employment will take place, for example due to shifting from fossil fuels to renewable energy sources, from truck manufacturing to rail car manufacturing, or from land filling and waste incineration to recycling;
3. Particular jobs may be eliminated without direct substitution (e.g. when the use of certain packaging materials is discouraged or forbidden and an end are put to their production);
4. Many existing jobs (i.e. plumbers, electricians, metal workers, and construction workers) may be altered due to the greening of day-to-day skill sets, work methods and profiles[14].

We have than two extreme situations and two cases in the middle of an ideal spectrum: from the creation of new 'green jobs' to the destruction of old ones passing by intermediate situations of transformation (or substitution when transformation is not possible) of old jobs in order to fit the new environmental goals.

'Green collar' jobs: a mix of traditional and new skills

On a general level, technological progress has reduced demand for low-skill workers and increased opportunities and rewards for higher-skill workers[15]. The increase in demand for higher educated people also holds true for environment-related industries.
UNEP states that a transition to a green economy will create demand for workers and that there is clear proof that a high share of the future green jobs will be high skilled (and thus well paid). Therefore potential skills shortages and increasing demand for medium and higher educated people will arise. However a growth in demand for several lower-skilled categories can also be expected.

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[14] http://ec.europa.eu/environment/enveco/industry_employment/pdf/labor_force.pdf

[15] http://www.cedefop.europa.eu/etv/upload/etvnews/news/3800-att1-1-presentation_slingenberg.pdf

Indeed, the eco-industry is polarized into high-skill and low-skill areas (OECD, 2004).
The majority of environment-related jobs are manual and clerical positions. The largest proportion is in water-related sectors (33% in 1996). In waste recovery and waste management, over 80% of jobs were manual and clerical in 1996 (OECD data cited in the ECORYS report[16]). Waste management and recycling often provide rather low-skill and low-pay jobs. In fact, educational qualifications are not relevant for most of the jobs offered in waste management. Also the ETUC study confirms that climate policies will not have a significant effect for jobs requiring lower qualifications[17]. On the contrary, in the eco-consulting sector firms employ relatively high levels of university graduates compared to the average qualifications in most national labour forces.
Many people are not aware of the close links between work activities and the environment. There is thus a need to increase people's sensitivity to, and involvement in, finding solutions for environment and development problems. In such a sense basic education for all can provide the environmental awareness, values and attitudes, skills and behaviour needed for sustainable development.
According to the OECD, environmental job qualifications and skills are traditional qualifications and skills applied to environmental issues. This would mean that there are no environmental qualifications per se, but that there are for example chemists working in the water and waste sectors[18]. Nonetheless a completely different view is held by the Austrian Institut für Wirtschaft und Umwelt, which considers the environmental goods and services industry to have different qualification requirements compared to the general qualification requirements: 'proof for this could be that the number of people in specific training programmes for environmental jobs (most often in higher education) was significantly higher than the need. This means that those people cannot find jobs even though the field is enlarging'[19]. Examples of specific 'green skills' are knowledge of sustainable materials, relevant traditional skills, "carbon foot printing" skills, environment impact assessment skills (flora, fauna, etc…) and good understanding of the 'sound' sciences.
In spite of the scarce information available on skills profiles in environment-related sectors, the ECORYS report analyses 6 specific sub-sectors:

- Eco-consulting: it is mainly undertaken by high-skilled people, technicians and crafts people;
- Jobs in waste collection and sorting: they are mainly undertaken by low skilled people;

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[16] http://www.cedefop.europa.eu/etv/upload/etvnews/news/3800-att1-1-presentation_slingenberg.pdf

[17] http://www.tradeunionpress.eu/Web/EN/Activities/Environment/Studyclimatechange/rapport.pdf

[18] OECD Seminar Social and Environment Interface Proceedings (1999). http://www.oecd.org/dataoecd/51/15/33848718.pdf

[19] OECD Seminar Social and Environment Interface Proceedings (1999). http://www.oecd.org/dataoecd/51/15/33848718.pdf

- Agriculture and fishery: only 17% of farmers in the EU-15 finished a basic or full training in agriculture. This statistic ranges from 3% in Greece to 64% in the Netherlands. The number of agriculture and fishery workers in the EU-27 has been decreasing since 2000 and was 8,580,100 in 2007;
- Agri-food sector: the level of education in the agri-food sector increased substantially between 2000 and 2006. The demand for new skills and a different type of the workforce in the agri-food sector is caused by the diversification of primary production (the attempt to generate more income from other sources) as well as by the enlargement of farms. Skills that are seen as very important are: entrepreneurial skills, employability, copying with waste management, innovative skills on an interdisciplinary level and skills needed for human resources management;
- Skills in renewables: one of the main barriers to the successful development of renewable energy is the availability of trained people. The expected net employment growth in the renewable energy sector equals 1,660,000 by 2010 and 2,463,000 by 2020. There are shortages in trained and competent employees. This condition will probably worsen as the sector is trying to grow to meet energy targets and demand. Some occupations in these sectors employ highly educated and specialized personnel such as technicians, engineers, and skilled trades. Jobs in biofuels processing require more technical skills. The jobs in recycling are very diverse in terms of required skills, health and occupational conditions, and wage. According to the handbook for Career Advisors and Occupational Councillors, many of the professions in the renewable energy sector originate from the more traditional science and engineering or business and management fields. This means that, to a large extent, professions in the renewable energy sector are transferable to and from other sectors and that this can be done with relatively limited retraining. Nevertheless, it is worth noting that new professions have also emerged;
- Cement sector: very little information was available on this topic. The only sound conclusion that can be drawn is that the level of qualifications (general skills, not green skills) of the jobs in the European cement sector has increased over the past several years[20].

All the studies taken in consideration underline the necessity to provide re-training to avoid losing the skills of people who lose their jobs and to meet increasing demands of high-skill workers in the emerging eco-industry. In particular the ETUC emphasizes that redeployment and retraining are easier when redistribution of jobs occurs within sectors[21]. Indeed, the ETUC study suggests using forward-looking management of jobs and skills (Gestion prévisionnelle des emploi et des competences, or GPEC, in French) and its associated tools to implement social support for policies on combating and adapting to climate change. These mechanisms should take account of R&D prorammes and the increasing role of new technological and employment

[20] http://www.cedefop.europa.eu/etv/upload/etvnews/news/3800-att1-1-presentation_slingenberg.pdf

[21] http://www.cedefop.europa.eu/etv/upload/etvnews/news/3800-att1-1-presentation_dupressoir.pdf

sectors. The report recommends ensuring efficiency by applying GPEC to broad employment sectors: 'national and European regulations will be needed to encourage employment sectors (which are mostly resistant to both the innovation and the training associated with change) to implement these mechanism'[22].

Retraining of the workers: ideas and practices

According to Carl Van Horn, professor of Public Policy and director of the John J. Heldrich Center for Workforce Development at Rutgers, State University of New Jersey, the most interesting feature of the green jobs issue is that quite often only little additional training is required: "in many of these jobs, the fundamental and foundational skills are already there. There are just additional 'green layers' and additional skills that need to be added for some. An electrician would understand how to wire and install a solar panel device, but he just might not understand where the best location might be"[23]. Such additional skills and competences can either be learned together with or after learning core skills. "Some green jobs, such as manufacturing workers in a solar panel factory, may not even need any particular green knowledge. Entry-level workers, e.g., those working with caulking and insulation for weatherization programs, may need little more than a few days of training in basic construction skills"[24]. Many blue-collar skilled trades workers may be easily retrained to move to construction and manufacturing fields. Even autoworkers may be easily repurposed toward the renewable energy sector and the retrofitting of buildings with energy-efficiency enhancing technologies[25].

Nevertheless, a number of colleges and trade schools are offering certificates, degrees and credentials in the eco-industry sector. But since the green industry is still in its infancy of developing its educational standards and career paths, communities will have to rely on flexibility as a way to capitalize on green industry growth. According to a joint report by the Apollo alliance (a coalition of labour, business, environmental and community leaders) and the Centre on Wisconsin strategy (a national policy centre for economic development), the "most efficient and effective way to prepare a green-collar workforce is to build on the existing foundation of state and local workforce development systems"[26]. One example is the Los Angeles Trade-Technical community college, which launched its Green College Initiative in Fall 2006 convening with regional utilities, unions and trades groups over which industries were underserved by job training programmes. The school integrated 'green course content' into existing programs such as carpentry, diesel technology and community planning, and developed four 'green-related' degree or certificate programs, including a solar design, installation and maintenance program.

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22 http://www.tradeunionpress.eu/Web/EN/Activities/Environment/Studyclimatechange/rapport.pdf

23 http://www.goverdeahora.com/news/retooling_the_work_force_for_a_green_economy/

24 *Ibidem*

25 http://www.carseek.com/articles/auto-workers-obama-green.html

26 http://www.sustainableindustries.com/greenbuilding/42017582.html?page=4

The UNEP Green Jobs Report highlights the experience of the Oakland Green Jobs Corps, a job-training program that provides a pathway into green careers for Oakland, California, residents with barriers to employment. Since the fall of 2008 it is providing young adults with job-training, support, and hands-on experience so they can independently pursue opportunities in the new energy economy.
Local firm have joined an Oakland Green Employer Council and are playing a critical role by shedding light on their workforce needs and providing internship placement opportunities for Corps trainees.
While in Europe there is already a broad offer of university 'green' degrees, vocational training public and private agencies have taken up the challenge of helping the transition to a green economy, offering different kinds of certifications and training opportunities, in some cases free of charge (as in the case of Enaip, Turin[27]). Unfortunately still much has to be done in Europe in order to institutionalise such programmes into a set of policy frameworks aimed at training millions of green collar workers and lift many people out of poverty. In this regard the Apollo Alliance and the Green for All initiatives in the United States have set an example for providing millions of people with the possibility of high quality job training in the emerging green economy, especially for people from disadvantaged communities. Nonetheless such programmes should take account of the European institutional frameworks and the local social configurations.
A path-breaking example of local communities engaging in the transition to the green economy is the Sherwood Energy Village, created in the Nottinghamshire, United Kingdom. When the Ollerton mine closed in 1994, the miners created the village as a carbon neutral community, a 36-hectare site transformed with the help of EU regional funding to provide a mixed facility offering industrial units, office space and housing along with recreational and educational facilities. The site provides employment for about 1200 people[28].

[27] http://www.pagina.to.it/index.php?method=section&action=zoom&id=2107

[28] http://ec.europa.eu/social/main.jsp?catId=370&langId=en&featuresId=63