



ANALYTICAL HIGHLIGHT

FOCUS ON

Environmental awareness skills

- Core environmental goods and services sector (eco-industry) jobs accounted for around 2% of all EU-28 jobs in 2011.
- Since 2003, the number of these jobs has increased at nearly nine times the rate of total employment. Jobs connected to the eco-industry account for another 8% of all EU-28 jobs.
- Among businesses and consumers, environmental awareness skills are needed to assess the costs, benefits and risks of investments in environmentally-friendly and resource-saving equipment, systems, products and services, and to ensure compliance with standards, rules and regulations.
- The demand for environmental awareness skills within occupations is influenced primarily by the regulatory and incentive schemes introduced under energy and environmental policies. The need for practical and theoretical environmental awareness skills is filtering into education and training programmes.

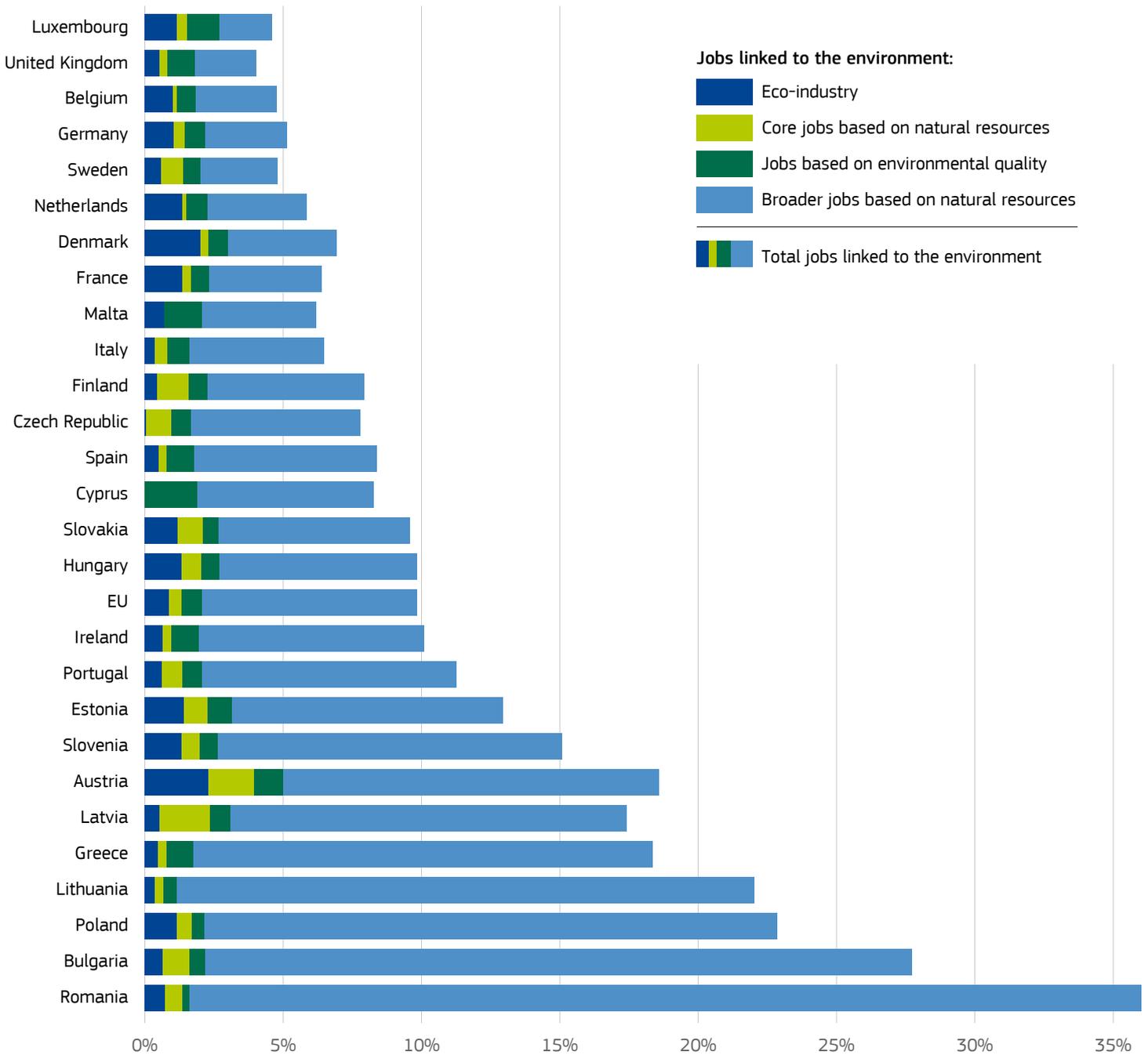
The protection of the environment plays an increasingly important role in the EU economy

The state of the EU-28 economy and the condition of the environment affects the life of all Europeans. A clean and healthy environment is essential for maintaining prosperity and a high quality of life. But the strength and competitiveness of the economy is also essential if this quality of life is to be maintained. Increasing environmental awareness is recognised as strategically important in order to face up to ambitious European environmental objectives on the one hand, and the creation of jobs and increasing competitiveness on the other^{1 2}.

Employment in the environmental goods and services sector (EGSS), known as the “eco-industry”³, is estimated at around 4.2 million people in the EU-28, and accounted for 2% of all jobs in 2011⁴. This was an increase of 1.1 million (or 35%) since 2003, and 0.7 million (20%) since 2007 which compares with total employment growth over these two time periods of 4% and -1% respectively.

Nine out of ten of jobs in the core eco-industry are in: waste management (22%), production of energy from renewable sources (21%), wastewater management (15%), protection and remediation of soil, groundwater and surface water (11%), management of water (10%), and heat/energy

▼ Figure 1 – The proportion of total jobs linked to the environment, EU-28,



Source: ICF adapted from GHK, CE, IEEP (2007)⁸

saving and management (10%). Moreover, it is estimated that 19 million jobs in 2010 directly depend on ‘connected’ eco-industries such as tourism, construction, automotive, ICT, paper industry and chemicals (and the core eco-industry supply chain) where the primary function of these sectors is not the environment. This represents 8% of all EU-28 jobs⁵.

Additionally, taking account also of the jobs that are indirectly linked to the environment, some 14.6 million jobs are estimated to be dependent

on the earth’s natural resources and provided directly or indirectly by ecosystem services. Many of these jobs are, and will continue to be, affected more and more by the gradual loss of biological diversity and ecosystem degradation⁶. Across the economy there are also those jobs that help to improve a firm’s environmental performance and those that supply component and materials to support growing eco-industries⁷. When these indirect effects are included, it is estimated that around one job in six is dependent on the environment in some way.

For workers in eco-industries and in jobs that depend on the environment, there is a particular need to take account of environmental concerns in their decision-making, and apply products, processes and technologies to reduce the impact of economic activity on the environment⁹. While these environmental awareness skills – sometimes known as ‘generic green skills’¹⁰ or ‘green literacy’ – are particularly pertinent to jobs directly linked to the environment, an understanding and appreciation of the issues and demands to lessen the environmental impact or use fewer natural resources are required in almost any occupation¹¹.

A Cedefop study of nine occupational groups¹² identified that the demand for environmental awareness skills within occupations is influenced primarily by the regulatory and incentive schemes introduced under energy and environmental policies. In addition, market pressures to reduce operational costs for energy and raw materials, investment conditions and consumer trends are seen as further drivers of change for employer demand for environmental awareness skills. The study emphasises the need for consistent regulation and sustained investment to ensure that markets for environmentally-friendly products and services become self-sustaining.

Environmental awareness is playing a key role in supporting shifts to a greener economy

Many factors affect the transition to sustainable growth – the development of technology, climatic drivers and, critically, the level of business and consumer demand for environmentally sensitive products and services.¹³ The cumulative and interactive impact of these factors on the demand for environmental awareness skills is seen to cut across occupations as all sectors find themselves affected by changes in the way in which natural resources are used.¹⁴

Despite uncertainties surrounding environmental, market and policy developments, it is predicted, with some confidence, that the transition to sustainable growth will require significant expansion in employment in environmentally friendly activities that either replace polluting activities with cleaner alternatives (such as, renewable energy displacing fossil fuels¹⁵) or provide environmental services (such as, waste management and reforestation)¹⁶. Taking into account the potential displacement of jobs, scenario-based forecasts project a modest, positive net outcome of 250,000 jobs in the EU-28 by 2020 as a result of low carbon policies.¹⁷

The market for environmental technologies is seen as a big opportunity for EU businesses. The global eco-industry market is estimated to almost double in value from €1.15 trillion a year in 2010 to around €2 trillion a year in 2020¹⁸. The EU holds roughly one third of this global market for eco-industries¹⁹.

In Ireland, for example, employment demand in the green economy²⁰ is projected to increase by between 5% and 11% per year from 2010-2015 depending on the speed with which barriers to sector development are removed²¹. The Danish Energy Agency (2013) estimates that the growth potential of energy efficiency equipment and advice is around 27bn Dan-

ish Krone (~€3.6bn)²² by 2020, supporting 9,000 new jobs – two-thirds of which would be due to the export of energy efficiency equipment and advisory services to other European and international markets.

Skills challenges: new skills and upgraded skills

Where job creation is envisioned as part of a green economy, there is a recognised need for re-training and increased environmental awareness²³⁻²⁴. The impacts on skills within sectors are likely to be both quantitative (in terms of the number of jobs) and qualitative (in terms of job content). Technical ‘green’ skills will depend on developments within different industrial sectors and occupations. For example, the trend towards constructing new ‘green’ buildings or retrofitting requires skilled building workers to have a better grasp of environmentally-friendly materials and technologies that are energy-efficient or greener²⁵⁻²⁶. As far as managers are concerned, environmental pressures – through legislation, changes in consumption and competition for resources – will present a wide variety of challenges and opportunities for managers in services and production²⁷. This will lead to profound changes in the ways organisations manage, resource, produce, distribute and market their goods and services²⁸.

In a study to identify future skills needs in jobs that depend on biodiversity, a number of emerging environmental awareness skills gaps were identified – across each of the six occupational groups investigated in detail²⁹ – including a lack of general understanding of the environment³⁰; knowledge of legal requirements associated with the environment³¹; and communication and negotiation skills³².

Although not widely researched, some of the generic green skill needs may be crucial³³. Based on case study analysis, evidence reviews, and stakeholder consultations, a number of areas in which environmental awareness skills gaps may arise are reported³⁴. This includes, but is not limited to:

- Sales and customer service skills for occupations engaged in delivering environmental and energy saving technologies and advice to consumers;
- Management and coordination skills for holistic and interdisciplinary approaches towards design solutions to meet economic, social and environmental objectives;
- Innovation skills and analytical thinking to identify opportunities and create new strategies to respond to green challenges;
- Business acumen and entrepreneurial skills for those seeking to commercialise new product innovations and seize the potential of environmental technologies; and
- STEM skills: general understanding of the role of the science, technology, engineering and mathematics’ contribution to the process of greening economies and societies;

More robust research is however needed to assess the scale and significance of potential shortages in environmental awareness skills and shape the list more accurately³⁵.

Evidence in the UK suggests that the demand for environmental awareness skills arises at all levels and in many forms, across all firms and sectors. While some of these skills are considered new, many others are not; they involve undertaking established activities within a distinctive context requiring greater levels of environmental awareness and understanding. In particular, two types of ‘green’ skill required by all organisations are identified: skills supporting resource efficiency, and skills to manage the natural assets that underpin all business practices³⁶.

Environmental awareness is filtering through into programmes for education and training

In order to adapt existing jobs to new requirements and add new skills to existing occupations – to meet the demand for ‘environmental awareness’ skills that are emerging – it is considered necessary to expand education and training options for the existing workforce and those currently unemployed³⁷. In spite of the many policy initiatives emerging at local, regional and national levels, there is however no uniformity among Member States in the way that environmental awareness is introduced into education curricula³⁸.

The limited evidence available highlights that education and training systems are being used to enhance the supply of environmental awareness skills within the workforce in some European countries more than others. Germany and Finland, on the one hand, have relatively well developed mechanisms for introducing environmental awareness into the school curriculum. In Ireland, specific recommendations of the EGFSN report are being acted upon by the education and training authorities to develop environmental awareness skills of sales and marketing staff, skilled workers and operatives³⁹. In other Member States such initiatives are voluntary (e.g. the UK), still in the planning stage (e.g. Slovakia and Hungary) or vary in sophistication owing to regional responsibility for implementation (e.g. Italy)⁴⁰. Across Italy, while fragmented regionally, investment in the education and training systems focused on the development of transversal environmental skills has resulted in an increase in the quantity and variety of environmental training courses, now reaching around 55,000 persons each year⁴¹. ■

1 European Commission (2012), Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions: Towards a job-rich recovery
 2 European Commission (2012), Exploiting the potential of green growth
 3 The OECD and Eurostat working definition of environmental goods and services are those that help to: "...measure, prevent, and correct environmental damage to water, air and soil, and solve problems related to waste, noise and ecosystems. This includes technologies, products and services that reduce environmental risk and minimize pollution and resources". In ECORYS and IDEA Consult (2009), Study on the competitiveness of the EU eco-industry
 4 Eurostat (2014), Employment in the environmental goods and services sector [env_ac_egss1]
 5 DG Environment (2012), The number of jobs dependent on the environment and resource efficiency improvements: Final report
 6 The persistent decrease in the capacity of an ecosystem to deliver services, such as the provision of food, fuels, fibres, fresh water, medicines and genetic resources, as well as regulation of the climate, air quality and soil quality. FEEM, GHK, Ecologic and IEEP (2011), The social dimension of biodiversity policy

7 DG Environment (2007). Links between the environment, economy and jobs
 8 DG Environment (2007). Links between the environment, economy and jobs. Figures for Croatia are not available.
 9 Cedefop (2013), Skills for a low carbon Europe: the role of vocational and training in a low carbon Europe
 10 Cedefop (2010), Skills for green jobs: a European synthesis
 11 Pavlova M., 7th Biennial International Conference on Technology Education Research 2012 (2012), Generic green skills: Can they be addressed through technology education?
 12 The nine occupations were: electrician, energy auditor, environmental engineer, insulation worker, nanotechnologist, refuse collector, sheet-metal worker, solar photovoltaic installer and transport vehicle emissions inspector. Cedefop (2013), Skills for a Low Carbon Europe: the role of vocational and training in a low carbon Europe
 13 Martinez-Fernandez, C., Hinojosa, C. & Miranda, G. (2010) Greening jobs and skills: Labour market implications of addressing climate change
 14 Cedefop (2009) Future skills needs for the green economy
 15 One assessment of employment impacts estimates that 2 million jobs could be created by growth in the renewable energy sector alone. Fraunhofer ISI, Ecorys, EEG, Ruetter, LEI and SEURECO (2009), The impact of renewable energy policy on economic growth and employment in the European Union
 16 OECD (2012), Enabling local green growth: Addressing climate change effects on employment and local development
 17 Cedefop (2013), Skills for a low carbon Europe: the role of vocational and training in a low carbon Europe
 18 DG Environment (2012), The number of jobs dependent on the environment and resource efficiency
 19 European Commission (2011), EU environment policy supporting jobs and growth
 20 The six sub-sectors included are: renewable energies; efficient energy use and management; water and wastewater treatment; waste management, recovery and recycling; environmental consultancy services; and ‘green’ ICT applications/software.
 21 , Expert Group on Future Skills Needs (2010), Future skills needs of enterprise within the green economy in Ireland
 22 Danish Energy Association (2013), Energy technology market assessment and job estimates
 23 Raingold, A. (2011) ‘Greening the economy: a strategy for growth, jobs and success
 24 Aldersgate Group, GIZ (2012), Green economy – the economy of the future
 25 EU Skills Panorama (2014), Building workers: Analytical Highlight
 26 Cedefop (2010) Skills for green jobs: a European synthesis
 27 ILO (2012), Greening the global economy – a global view
 28 EU Skills Panorama (2014), Managers in services and production: Analytical Highlight
 29 Farmers, habitat restoration specialists, planners, regulatory inspectors and corporate environmental/social responsibility managers. ICF GHK (2012), European Union biodiversity objectives and the labour market: benefits and identification of skill gaps in the current workforce
 30 This includes skills to ensure that impacts can be appropriately monitored; appropriate actions are taken to minimise the impact of activities on the environment; and ensure the integration of environmental considerations into planning and regulatory activities.
 31 To improve the implementation of EU and national environmental protection laws, an increased knowledge of how environmental laws work in practice, better sharing of that knowledge, and more effective responses to actual or potential environmental problems are needed. DG Environment (2014), statistics on environmental infringements
 32 This includes skills to: inform and influence the regulatory process and corporate strategies; effectively manage any resistance to new approaches; and communicate a sense of shared purpose to support effective policy implementation.
 33 Renner M. Worldwatch Report 177 (2008), Green jobs: Working for people and the environment
 34 Cedefop (2012), Green skills and environmental awareness in vocational education and training
 35 Pavlova M., 7th Biennial International Conference on Technology Education Research 2012 (2012), Generic green skills: Can they be addressed through technology education?
 36 UK Department of Business, Innovation and Skills (2011), Skills for a green economy
 37 Cedefop (2012), Green skills and environmental awareness in vocational education and training
 38 DG Environment (2010) Programmes to promote environmental skills
 39 Expert Group on Future Skills Needs (2010), Future skills needs of enterprise within the green economy in Ireland
 40 Expert Group on Future Skills Needs (2010), Future skills needs of enterprise within the green economy in Ireland
 41 The Institute for the Development of Vocational Training for Workers (2011), Informazione Formazione Orientamento Lavoro Ambientale (Ifolamb): Rapporto 2004-2009

Please quote this Analytical Highlight as:
EU Skills Panorama (2014)
Environmental awareness skills Analytical Highlight,
 prepared by ICF and Cedefop for the European Commission