



# Cultivating Green Futures: Helping students understand and progress towards green jobs

Strong career guidance systems are essential in helping students navigate the evolving landscape of the job market, particularly in the growing field of green jobs. Green jobs, which play a crucial role in advancing environmental sustainability, require a workforce equipped with specific skills and knowledge. While student interest in environmental issues is evident, green sector employers frequently voice recruitment concerns. Career guidance systems can bridge this gap, notably by providing students with authentic and frequent interactions with professionals in green industries. These interactions can include career talks, work placements, and hands-on learning experiences that offer students direct insight into green careers. Such initiatives are especially valuable in secondary education, where students can learn about the opportunities, pathways, and training required for green jobs. This policy brief presents findings from the OECD Working Paper: Enhancing Green Guidance Systems for Sustainable Futures.

The brief:

- Defines green jobs as roles directly related to combatting climate change and promoting sustainability, while discussing the anticipated global impact on the labour market, including job creation in green sectors and the phasing out of carbon-intensive (brown) jobs.
- Draws on the OECD's Programme for International Student Assessment (PISA) 2018 to highlight the strong interest of young people in environmental issues and the importance of guidance systems in helping them better understand and progress towards green jobs.
- Builds on wider analysis of more effective career guidance to present a framework for green guidance, with illustrative practice examples.
- Conceptualises green guidance, drawing from OECD work on teenage career readiness and 87 green guidance programmes from 20 OECD countries.
- Describes various green guidance programmes across countries, focusing on their objectives and design in preparing students for green careers.

In international surveys, young people express strong commitments to supporting environmental sustainability, including significant interest in securing jobs that contribute to the global response to climate change. At the same time, however, employers are expressing concern over finding workers with the necessary skills and knowledge for addressing ecological challenges and meeting global climate goals. Career guidance systems can bridge this gap by helping students understand and progress towards green jobs which are expected to play a pivotal role in advancing environmental sustainability.

## What are green jobs?

The green transition, or the global shift towards net-zero emissions, is expected to impact the labour market in three ways:

- The creation of jobs that will create new economic opportunities (green jobs)
- The loss of jobs that contribute to climate change (brown jobs)
- The transformation in skills and knowledge required across many current professions

Forecasting green job growth and employment and the impact of the green transition is complex, notably because there is no universally agreed-upon definition of what constitutes a green job. Definitions vary across international organisations, governments, and industries, leading to differing approaches in identifying and categorising green jobs.

Broadly, two dominant methods exist: the *top-down approach*, which classifies entire sectors or industries as green, and the *bottom-up approach*, which focuses on the specific skills, tasks, and job titles associated with green activities. This lack of consensus hinders the provision of clear and simple information for guidance systems. It also underscores the complexity of a situation where, depending on the approach applied, the same job can be classified as either green or brown. Additionally, individuals can hold jobs green jobs within industries that are not typically considered as contributing directly to environmental sustainability.

The United Nations and the International Labor Organization (ILO) apply top-down definitions, categorising green jobs as those within sectors that significantly contribute to environmental preservation or restoration. The ILO also emphasises the social dimension of green jobs, defining them as 'decent' jobs that are productive, secure, and offer fair remuneration. Moreover, the ILO distinguishes between 'green' and 'greening' jobs. Green jobs are defined as those that are directly linked to the environment, while greening jobs are those that integrate new skills with an environmental dimension into existing occupations (ILO, 2022<sup>[1]</sup>). Conversely, the bottom-up approach, exemplified by the U.S. Department of Labor's O\*NET system, identifies green jobs based on specific skills, tasks and job titles, expanding the scope to include roles in traditionally non-green industries.

Despite the lack of a unified definition, the growth of green jobs is evident and is experiencing significant job creation worldwide. The ILO predicts 23 million new green jobs will be created globally by 2030, while 6 million brown jobs will disappear (ILO, 2022<sup>[1]</sup>). So far, the renewable energy sector has seen the largest growth of any sector, adding 700 000 jobs globally from 2020 to 2021, reaching a total of 12.7 million (IRENA and ILO, 2022<sup>[2]</sup>). Globally, green jobs are now among the fastest growing and most resilient.

As the green transition progresses, brown jobs, which are carbon-intensive, are being phased out. In 2012, brown jobs comprised 14% of total employment in the European Union (EU), but by 2022, this figure had dropped to 5% (Vandeplass et al., 2022<sup>[3]</sup>). This trend is echoed across OECD countries, where green jobs currently represent approximately 19% of labour demand, but brown jobs account for only 5% of vacancies (OECD, 2023<sup>[4]</sup>). In 2021, brown jobs made up 12% of employment in the OECD, green jobs 18%, and white jobs, which are neither green nor brown, the majority at 71% (OECD, 2023<sup>[4]</sup>).

Despite the growth of the green sector, the challenges posed by skills gaps and shortages are being increasingly recognised as significant barriers to the green transition. Reports from employers are highlighting the urgent need for skilled workers in industries that will be key to the green transition, including in renewable energy, environmental services, and sectors focusing on resource efficiency. According to the World Economic Forum's Future of Jobs Survey (2023<sup>[5]</sup>), approximately 60% of the 803 participating global companies, employing 11.3 million workers across 27 industries from 45 countries, indicated that the lack of skilled labour was a major obstacle to adopting greener business practices. This shortage is not confined to any single region. The European Commission notes that labour shortages doubled in key green sectors between 2015 and 2021 (Eurofound, 2023<sup>[6]</sup>; Eurostat, 2021<sup>[7]</sup>). In the United States, the number of job vacancies in the renewable energy sector has been increasing faster than the number of job placements (USEER, 2023<sup>[7]</sup>). While global LinkedIn candidates listing green skills grew by 8.4%, this was overshadowed by a 20% increase of green job postings in 2022, indicating a widening gap between demand and available expertise (LinkedIn, 2023<sup>[8]</sup>).

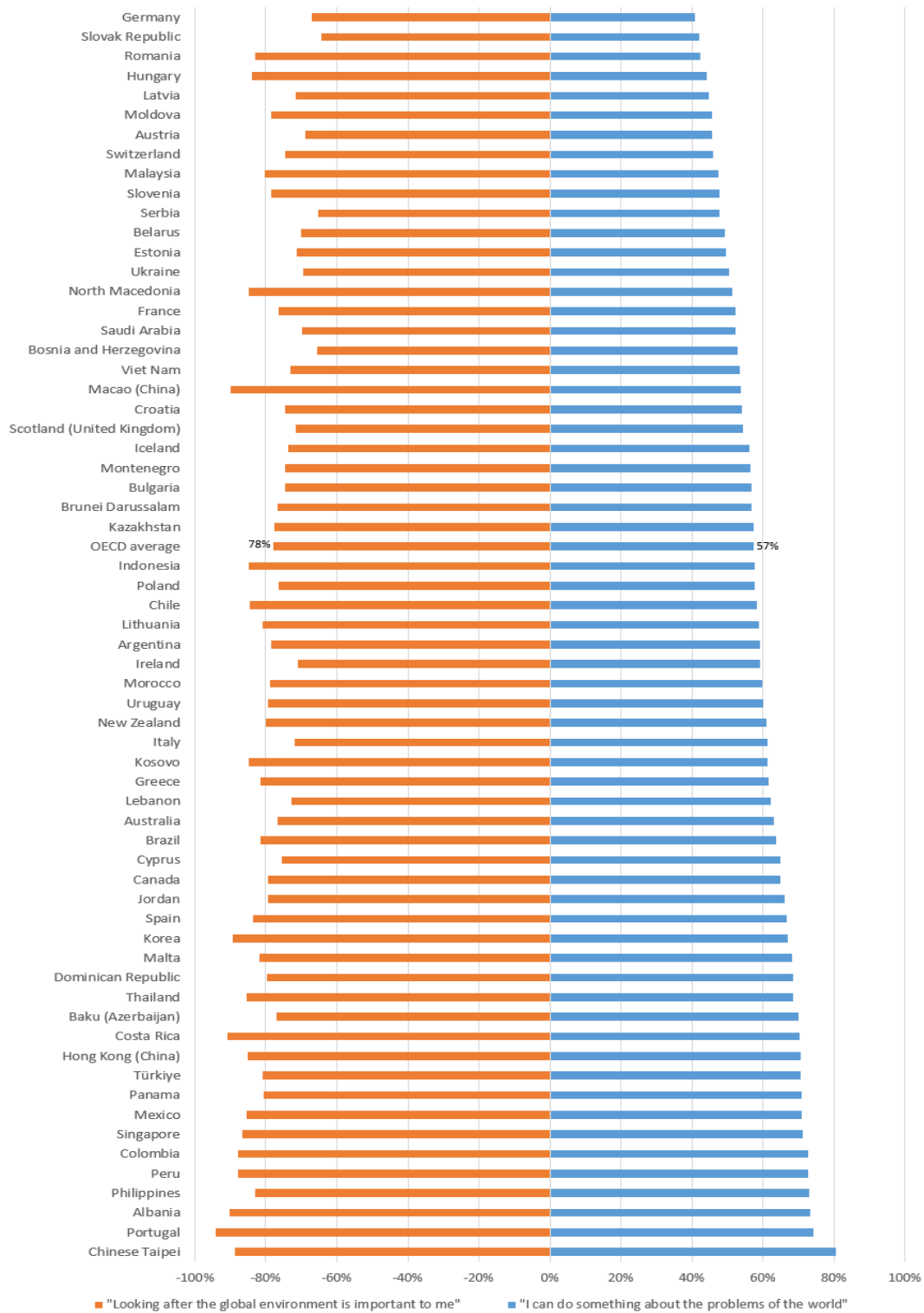
## Green futures: Insights from PISA

During periods of rapid change in labour markets, career guidance systems have a particularly important role in helping students understand and plan for careers in emerging fields of employment. In the context of green jobs, guidance programmes can connect young people's interests in protecting the environment with growing green labour market demands, broadening their understanding of opportunities and the skills and qualifications required for specific occupations.

The Programme for International Student Assessment (PISA) 2018 included a particular focus on environmental issues, as part of student global competence. The results reveal that, at the age of 15, students around the world are strongly engaged in environmental issues. On average across OECD countries, 78% of students express confidence in their understanding of climate change and its impacts (OECD, 2020<sup>[9]</sup>). However, the PISA reveals a notable gap in students' sense of agency in combatting climate change. While 78% agree or strongly agree that looking after the environment is personally important, only 57% feel that they can actively contribute to solving global environmental challenges (OECD, 2020<sup>[9]</sup>). In every country and economy, the share of students reporting that environmental protection was of personal interest always exceeded the share of students reporting a sense of environmental agency (Figure 1).

Figure 1. Young people care about climate change but often feel unable to make a difference

Percentage of students who agree or strongly agree



Source: OECD, PISA 2018 Database, Table VI.B1.5.3

Other international surveys consistently indicate that there is strong interest among young people to work in occupations that contribute to environmental sustainability. For instance, a survey by YouthSight of 1,162 young people, aged 16 to 24 in the United Kingdom, found that 80% of respondents considered it important to work for an organisation committed to tackling climate change, and 61% wanted a role specifically focused on this issue (White et al., 2022<sup>[10]</sup>). Additionally, the survey (White et al., 2022<sup>[10]</sup>) showed that 55% of youth felt inspired to develop green skills and pursue a green career, primarily motivated by a desire to combat climate change (71%) and a passion for sustainability (62%).

One assessment of the strength of labour market signalling relates to student interest in engineering professions. Such occupations are key to the green transition. However, analysis of PISA data shows no strong correlation between personal concern for the global environment and interest in becoming an engineer. Among OECD countries participating in the PISA 2018, the average proportion of 15-year-old boys expressing the intention to pursue engineering as a career by the age of 30 was 8%, while this figure was notably lower at 2% for girls (OECD, 2020<sup>[9]</sup>). There was only a marginal difference between the percentage of students who strongly agreed with the statement that “looking after the global environment is important to me personally” (4.4% saying that they would be interested in engineering) and those who did not agree with the statement (4.3% of students reporting that they would like to pursue engineering) (Mann, 2022<sup>[11]</sup>; OECD, 2020<sup>[9]</sup>).

Another significant challenge related to the analysis of green jobs and student interest in them arises from the current limitation in classifying green jobs using the 2008 edition of the International Standard Classification of Occupations (ISCO-08) by the ILO (Gregg, Strietska-Illina and Büdke, 2015<sup>[12]</sup>). The ISCO is widely used by governments as a primary tool for identifying and categorising occupations. Due to the rapid growth of the green sector over the past decade, the 2008 edition does not capture the nuances of green tasks embedded within various job families and sectors. This makes it difficult to accurately assess student interest in green careers across countries and over time (Mann, 2022<sup>[11]</sup>).

In these circumstances, the role of guidance systems is important for helping students visualise, plan and prepare for fulfilling futures within work. Enhancing guidance systems to connect student interest with actual labour market demands can help cultivate a global workforce committed to sustainability, bridging the gap between their aspirations and demand within the green labour market.

## Conceptualising green guidance

To bridge the gap between broad student interest in fighting climate change and an informed understanding of green jobs and career paths, guidance systems around the world have introduced new approaches within career provision. Reviewing these specialised programmes against evidence-based characteristics of more effective guidance provision allows green guidance to be conceptualised as a coherent approach that can enhance student understanding of, and progression towards, green jobs.

### ***Methodology: How the study was conducted***

The recent OECD study, *Enhancing Green Career Guidance Systems for Sustainable Futures*, examined 87 guidance programmes in primary and secondary education focused on enhancing student understanding and progression towards careers linked to environmental sustainability (Chang and Mann, 2024<sup>[13]</sup>). Programmes were initially identified through online searches using keywords related to environmental education, sustainability, green jobs, and career guidance. The review included early years to upper secondary programmes from 20 OECD countries. Data collection involved gathering information on programme objectives, design, target age group, duration, providers, resources, and other relevant details. This was supplemented by 30 interviews with programme developers, academic experts, school leaders, and government officials to provide additional insights.

For the review, green jobs were defined as those that:

Actively combat climate change through mitigation and adaptation strategies, ensuring environmental sustainability and the well-being of individuals and communities, as well as working to restore the environment and reduce harmful ecological impact.

Green career guidance, or 'green guidance,' is a form of general career guidance that helps individuals understand and progress towards green careers. Despite the limited research on green guidance, key figures like Danish academic Peter Plant (2021<sup>[14]</sup>; 2020<sup>[15]</sup>; 2014<sup>[16]</sup>) have contributed significantly to its conceptualisation. Green guidance emphasises the environmental impact of career choices, the creation of training opportunities for sustainability, and the inclusion of environmental aspects in career information.

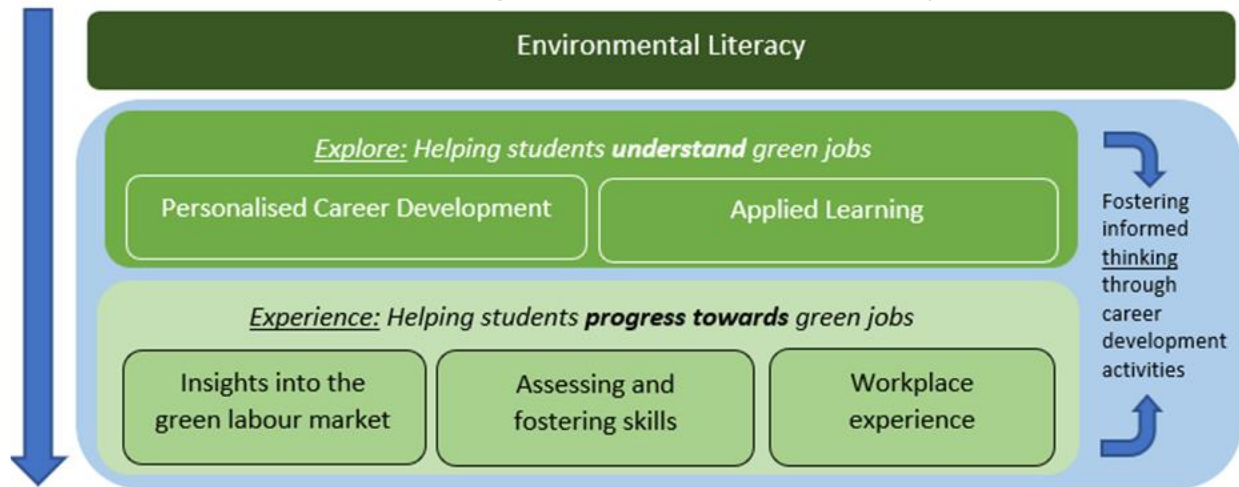
### **Framework for green guidance**

The OECD framework for green guidance builds on effective practices and the foundation of what is known to enhance the employment outcomes of young people. OECD analysis of longitudinal datasets in ten countries shows strong correlations between improved employment outcomes and three key aspects of career development: how students *explore*, *experience*, and *think* about their potential futures in work (Covacevich et al., 2021<sup>[17]</sup>). Through specific activities of career development such as job fairs, career talks or volunteering in the community, students gain valuable work-related insights that support the growth of their human, social and cultural capitals. Firstly, career development helps students decide on learning routes and qualifications, gain relevant experience, and acquire skills that align closely with their career ambitions, thereby enhancing their human capital. Secondly, it enables students to build networks with individuals who are well placed to provide reliable information and guidance as well as recommendations and references regarding specific career paths, which are forms of social capital. Lastly, career development has the capacity to underpin personal agency, fostering authentic understanding and confidence in suitability for professional fields and pathways into them, empowering students to take charge of their vocational journey, which is fundamental to cultural capital (OECD, 2024<sup>[18]</sup>).

Effective green guidance will build on and develop foundational environmental literacy to enable students from a young age to see relationships between their classroom studies and potential futures in adult employment. Moreover, it will provide considerable opportunity for students to explore potential occupational areas in increasing detail, enabled through authentic, first-hand encounters with people working in relevant professions and their workplaces. In such a way, students become better placed to navigate their journeys through education and training, drawing links between their daily investment in learning and imagined futures. The OECD Career Readiness framework for green guidance (Figure 2) considers effective green guidance to go beyond information provision, offering personalised opportunities for exploration and work-based experiences to support informed career decisions and gain hands-on engagement with green workplaces.

**Figure 2. A model of green guidance**

The conceptual model draws upon current green guidance practices and OECD analysis of longitudinal datasets that explores the relationships between teenage career development and better employment outcomes in adulthood.



### A review of green guidance programmes

A scoping review was undertaken of 87 guidance programmes designed to help students from early years to post-secondary education to understand and progress towards environmentally sustainable jobs. These programmes vary from short-term activities to extensive provision spanning months or years. Many programmes are designed to help students understand green jobs through exploration and thinking. They often complement national curricula by showing students the links between potential career plans, guidance provision, and educational engagement. Other programmes provide students with opportunities to engage personally within green sector workplaces, providing experience that can support smooth transitions from secondary education into either employment, training or continuing studies. In many countries, such immersive programmes are offered during the summer months to allow students dedicated time for participation. Participation in such programmes is voluntary and typically attracts those who already have an interest in green careers or the green sector.

Governments are the primary supporters and funders of the initiatives reviewed, which cater to a diverse cohort of students, including those from disadvantaged backgrounds, Indigenous communities, students passionate about environmental issues and those disinterested or unaware of environmental matters. Learning environments for these programmes range from outdoor natural conservation areas to traditional classrooms and virtual platforms. Pedagogical approaches include experiential, active learning formats as well as more direct, curriculum-driven methods delivered by subject teachers, specialised environmental educators, and guidance counsellors.

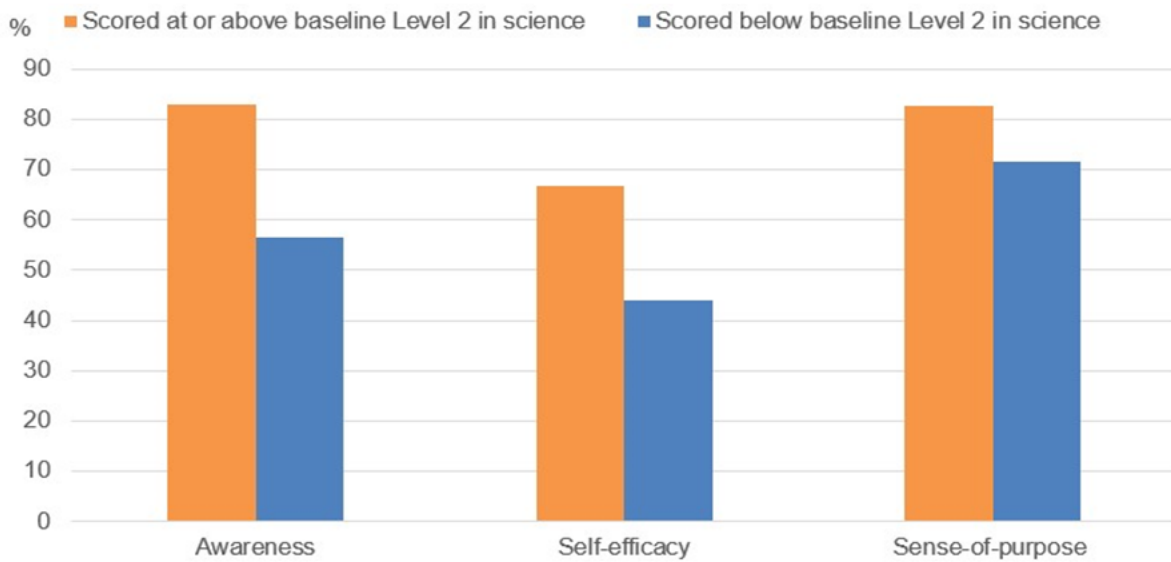
**Career exploration: Helping students understand green jobs**

*Importance of student environmental literacy*

Green guidance must build on a foundational environmental literacy that helps students make sense of ecological challenges and responses to them. This literacy includes knowledge of ecological principles, a sense of personal responsibility for the state of the planet, a willingness to take action to maintain natural resources, and an understanding of the interconnectedness between human activities and the environment (OECD, 2022<sup>[19]</sup>). The OECD’s PISA 2018 findings indicate that student proficiency in environmental science and sustainability are positively related to pro-environmental attitudes, values, and behaviours (Figure 3).

**Figure 3. Student environmental attitudes by proficiency in science**

Overall average percentage of students who display environmental awareness, sense-of-purpose or self-efficacy in environmental understanding



Note: differences between students who scored in science at or above baseline Level 2 in science and students who scored below baseline proficiency Level 2 are all statistically significant

Source: OECD, PISA 2018 Database, Tables B.3.2, B.3.4 and B.3.6.



On average, 15-year-olds who displayed environmental awareness, self-efficacy in environmental understanding, and a sense of purpose performed higher in the PISA science assessment than those who did not display these attitudes (Box 1).

### Box 1. How student pro-environmental attitudes are measured in the PISA

#### Environmental awareness

Student environmental awareness refers to student understanding of environmental issues and phenomena, such as the consequences of deforestation, attitudes towards the environment, and the sources from which students have gained their environmental knowledge. The PISA 2018 asked students how informed they were about climate change and global warming. Response options included statements such as, “I am familiar with this and I would be able to explain this well” or “I have never heard of this.”

#### Self-efficacy in environmental understanding

Self-efficacy in environmental understanding involves not only being aware of environmental problems but also having a scientific understanding of climate issues that is proficient enough to explain to others. In the PISA 2018 survey, students were asked how confident they felt in their ability to perform tasks such as, “Explain how carbon-dioxide emissions affect global climate change.”

#### Environmental sense-of-purpose

An environmental sense-of-purpose involves caring for the environment and taking actions to mitigate the impacts of climate change. In PISA 2018, students were asked to what extent they agreed with the statement, “Looking after the global environment is important to me” to measure sense-of-purpose.

Source: OECD (2022<sub>[20]</sub>), “Are students ready to take on environmental challenges?”, PISA in Focus, No. 120, OECD Publishing, Paris, <https://doi.org/10.1787/8148c568-en>.

Studies have found that climate change awareness and environmental literacy are strong predictors of environmentally oriented competencies, such as identifying global environmental challenges, promoting environmentally friendly products, and adapting technologies for sustainable practices (Rahmaningtyas et al., 2023<sub>[20]</sub>). PISA 2018 also showed that students who demonstrated strong environmental literacy were more likely to hold a growth mindset, which is important for fostering a sense of purpose and empowering students to effect change and combat the climate crisis (OECD, 2022<sub>[20]</sub>). However, environmental literacy and scientific knowledge alone do not automatically translate into responsible actions. It is the combination of science proficiency and pro-environmental attitudes that is most conducive to action (OECD, 2023<sub>[21]</sub>; 2022<sub>[19]</sub>). In the context of the green transition, this means that for students to aspire to green careers and contribute meaningfully to global environmental efforts, they must be able to access career development opportunities that help put environmental literacy into practice.

### Box 2. Example of practice in the United States

The Strategic Energy Innovation (SEI), a non-profit organisation in the United States, works with 230 schools and over 22,000 students (Kindergarten to grade 12) to provide sustainability education and environmental action projects. Their flagship programme, [Energize Schools](https://www.energizeschools.org/), delivers comprehensive environmental education focusing on student green career awareness and skills. This programme supports schools through four initiatives: Sustainability Curriculum, Environmental Competitions, Teaching Training and Zero-Waste Schools.

- Sustainability Curriculum aligns with wider student learning approaches, including the Common Core, Next Generation Science Standards, and California Career Technical Education. It uses both teacher-directed and student-centred pedagogical methods to build student environmental literacy. The curriculum includes a Career Connections Toolkit to help students explore green career options and offers additional certification programmes for upper secondary students, such as Sustainability Specialist or Energy Specialist, enhancing their job application profiles.
- Environmental Competitions: Middle and high school students participate in competitions like the People and Planet Challenge to develop leadership skills and inspire sustainable change. These competitions integrate environmental literacy, requiring students to build knowledge, apply green skills in practical projects, and act as sustainability leaders in their communities where they can apply skills to real-world issues.
- Teacher Training is provided via virtual, in-person, or hybrid training to teachers throughout the school year to build pedagogical capacity to deliver the sustainability curriculum.
- Zero Waste Schools is a sustainability initiative that partners with the wider community to promote student environmental stewardship.

Source: Energize Schools: A Program of SEI (2024), *Engaging, Inspiring, and Empowering Sustainability Leaders*, <https://www.energizeschools.org/> (accessed on 04 July 2024).

### *Providing personalised career development*

Effective and equitable career guidance personalises provision by recognising the unique aspects of an individual's career development and the barriers that can hinder successful transitions. Green guidance programmes can offer personalised career development to students by providing customised advice that aligns with their career goals and plans. These programmes can support students in setting career goals and creating roadmaps to achieve them, ensuring that there is ongoing communication and support as their goals and circumstances evolve. Personalised guidance also means providing tailored resources, such as job search tools, networking opportunities, and additional focused support, to meet individual needs and help students work towards green careers.

### Box 3. Example of practice in Austria

[Bildungsberatung NÖ](#), part of Bildungsberatung Österreich, is an initiative of the Austrian Federal Ministry of Education, Science and Research and the federal states, supported by the European Social Fund with national co-financing. It operates on a budget of 1.2 million euros annually, providing 10 000 consultations per year to users ranging from students aged 15 to adults up to age 65. The programme offers diverse channels for accessing green guidance and labour market information, including virtual and in-person services. Distance counselling is available via telephone, video, email, and chat, while face-to-face consultations occur in over 90 locations across Lower Austria. Services are provided in multiple languages. In 2021, Bildungsberatung NÖ launched "Green Jobs for You", a programme designed to encourage and enable young people to consider ecologically sustainable professions. The initiative offers free workshops to schools, consisting of two teaching units that use specially developed methods and online tools. Trained youth advisors help students explore potential green jobs for their career paths and the global green transition. Interactive quizzes on the programme website, designed for different age groups and needs, help students discover green jobs that align with their preferences, interests and capabilities. Additionally, a card game enables students to match their skills and values with potential green jobs, providing detailed job descriptions, work environments, and required education and skills. These resources allow counsellors and teachers to guide students in assessing their interests and skills, helping them make informed decisions about green career paths.

Source: Bildungsberatung Österreich (2024), *Green Jobs for You*, <https://www.greenjobs-noe.at/de/> (accessed on 02 July 2024)

*Applied learning*

For students, theoretical knowledge alone is often insufficient for developing a comprehensive understanding of workplace realities (Mann, Denis and Percy, 2020<sup>[22]</sup>). Green guidance programmes that incorporate applied learning opportunities enable students to apply their knowledge of environmental sciences to real-world challenges, thereby enhancing their capacity for informed career thinking and exploration. Applied learning can be a core component of a green guidance programme where critical career reflection is integrated formally within the school environment, with subject teachers and guidance counsellors relating green careers to their teaching and the standardised curriculum.

**Box 4. Example of practice in Belgium**

Circonopoly supports teachers in connecting the curriculum with green careers. This educational game developed by POM West-Vlaanderen in Flanders, Belgium, supports the national school curriculum. The aim of the game is to educate students from ages 8 to 18 about sustainable practice, particularly the principles of the circular economy. In Circonopoly, players run a company and choose strategies to maintain profitability while minimising environmental impact. Investment cards present scenarios such as using renewable materials, investing in solar panels, or engaging in waste management practices, detailing the costs and potential revenue or savings to illustrate economic and ecological trade-offs in business decisions. For instance, a card might suggest using renewable materials instead of finite resources, explaining the cost and impact on profitability and the environment. The game is designed to help students connect curricular content with the complexities and trade-offs involved in making businesses sustainable. The teacher's manual provides links to various educational possibilities within green career fields, facilitating student understanding of green jobs. Additionally, Circonopoly promotes interdisciplinary thinking across the curriculum. In language subjects like Dutch, the game encourages skills such as discussion, listening, and reading. In economics, the objective of creating a circular business model helps students address practical economic problems. The game also integrates subjects like geography by presenting the circular economy as a solution to resource scarcity and environmental challenges. Through this applied learning approach, this educational game helps students to connect classroom knowledge to real-world sustainability issues, fostering a practical understanding of environmental sustainability.

Source: Circonopoly (2024), *Online spel rond circulaire economie*, <https://circonopoly.be/> (accessed on 04 July 2024).

Applied learning can also be informal, going beyond traditional classroom settings and the school academic year, allowing students to engage in career development activities without curricular constraints.

### Box 5. Example of practice in the United Kingdom

[The Sustainable Futures Programme](#) in the United Kingdom, tailored for 14 to 18-year-olds, provides students with opportunities for applied learning in both formal and informal contexts. Developed by WWF-UK, in partnership with Villiers Park Educational Trust and Founders4Schools, and designed for delivery by teachers, career advisors, and counsellors, the programme promotes environmental literacy and establishes strong connections to green industries, helping students understand green jobs and their career trajectories. To support applied learning within a formal school context, including in secondary courses such as the sciences, geography, economics and business and other relevant disciplines, the programme facilitates immersive interactions with professionals and employers who demonstrate sustainability in practice. These engagements, whether virtual or in-person, include a variety of workplace activities that allow students to gain first-hand experience of green industries. Activities range from career talks and events at schools to career insight days, work experience placements, and extended placements where students work on real-life sustainability challenges. The programme provides students with practical insights into the application of sustainable principles in real-world contexts, while also building employability skills and broadening potential career paths.

Source: WWF-UK (2024), *Empowering Planet-friendly Career Pathways*, <https://www.wwf.org.uk/get-involved/schools/sustainable-futures> (accessed on 05 July 2024).

## Helping students progress towards green jobs

### *Insights into the green labour market*

Green guidance systems play a crucial role in connecting students to current and emerging opportunities linked to environmental sustainability. They can provide important insights into the latest developments, innovations, and job opportunities within the green sector that can help students develop informed thinking about their education and career paths. Timely, relevant, and reliable labour market information (LMI) is important for helping students explore their career options comprehensively. It enables them to consider various factors, such as the range and availability of potential green jobs, the nature of these jobs, the necessary skills, experience, and qualifications required, the expected salaries, and potential relocation requirements.

#### Box 6. Example of practice in Ireland

Launched in 2008 by Ireland's Ministry of Education and Science, [Careers Portal](https://careersportal.ie) is an online resource aimed at guiding secondary school students (ages 15 to 18), their parents and career guidance professionals through career development. It allows students to explore 33 employment sectors through interactive materials, including videos, employee insights, career interviews, courses, skills assessments, and development opportunities. Notably, three sectors—Farming, Horticulture & Forestry; Earth & Environment; and Biological, Chemical & Pharmaceutical Science—focus on the green economy, highlighting sustainability and environmental conservation jobs. Each sector on the Careers Portal includes four critical links for further exploration: *Explore*, which offers background information on the sector; *Careers*, which presents labour market information with detailed job descriptions; *Courses*, which helps users find relevant prerequisite study programmes for green jobs; and *Live Jobs*, which features a live database of green job vacancies in Ireland aggregated from major job sites. The portal collects and disseminates LMI through various means, including labour force data, online vacancy data, forecasts and sectoral studies. Additionally, the portal provides extensive resources for parents, guardians, and guidance professionals, supporting students in making informed career and post-secondary education/training decisions. It offers tools for delivering guidance, and updates on professional development, guidance-related news, and national events.

Source: Careers Portal (2024), *Career Guidance tools for all*, <https://careersportal.ie> (accessed on 05 July 2024)

### *Assessing and fostering skills for the green labour market*

Another crucial aspect of preparing students for their future careers involves assessing and understanding their individual values, attitudes, skills and knowledge (VASK). This self-awareness forms an important foundation for making informed career choices. When students clearly understand their attitudes and values, they are better equipped to identify career paths that align with their intrinsic motivations, leading to greater job satisfaction and long-term success in the labour market (Morgan, Isaac and Sansone, 2001<sup>[23]</sup>). Additionally, recognising and leveraging one's skills and knowledge is essential for matching personal capabilities with the demands of various professions. Students' interests and preferences play a guiding role in this process, influencing their decision-making and steering them towards careers that align with both their abilities and aspirations. To support students in becoming aware of their VASK, especially for entering the green labour market, many green guidance programmes can incorporate assessment

activities. These activities are often in the form of interactive quizzes, questionnaires, and self-reflective exercises, providing tools for students to envision how their traits align with their educational achievements.

### Box 7. Example of practice in France

**JobDD: Métiers Engagé**, developed by ONISEP, the French national agency for young people's career development, features an interactive multiple-choice quiz designed for students ages 12 to 18. The aim of the quiz is to align student interests, occupational preferences, and perceived skills with the 17 United Nations' Sustainable Development Goals (SDGs). Student responses are evaluated to determine their affinity for each SDG, subsequently suggesting occupations that correspond to these goals and that integrate various fields of interest. Students can then learn more about the occupation, such as the tasks and responsibilities, educational requirements, experience levels for entry, and salary information. With a strong emphasis on environmental issues, the quiz includes response options like "I want to protect the planet" ("je veux protéger la planète") or "I dream of working in the great outdoors" ("je rêve de travailler en pleine nature"). This interactive VASK assessment helps students gain self-awareness and guides them towards green jobs by identifying their most significant interests and skills.

Source: ONISEP (2024), *JobDD Métiers Engagé: Le Quiz JobDD*, <https://jobdd.onisep.fr/le-quiz-jobdd> (accessed on 05 July 2024)

### *Workplace experiences*

First-hand workplace experiences provide young people with a vision of their potential future, helping them build valuable social capital that can lead to economic benefits (Mann and Percy, 2013<sup>[24]</sup>). These experiences can also help enhance technical and social employment skills, boosting future employers' confidence in their employability. Research shows that career activities enriched by employer engagement and workplace experiences frequently yield positive outcomes for young people, such as a reduced likelihood of becoming NEET (Not in Education, Employment, or Training), higher earnings if employed full-time by age 25, and greater career satisfaction (Covacevich et al., 2021<sup>[17]</sup>). Guidance programmes that incorporate employer engagement and offer workplace experiences provide students with opportunities to gain practical expertise that can be best acquired through interaction with professionals. For green guidance programmes, providing workplace experiences not only enhances understanding of environmental principles but also offers holistic insights into the challenges and opportunities in emerging green careers.

### Box 8. Example of practice in Canada

[The Clean Foundation](#) is a non-governmental charity in Canada with a mission to provide knowledge, tools and supports to foster actions that lead to positive environmental change. It collaborates with employers across Eastern Canada to offer students workplace experiences that guide them towards green careers. One of the key initiatives is the Clean Leadership Summer Internship Program, which provides paid employment opportunities for young people aged 15 to 30. The internship emphasises leadership development and career exploration through mentoring, career conversations, workplace visits, and hands-on employment experiences. Interns work on environmental projects across rural and urban locations in Eastern Canada, gaining first-hand experience in green careers. The Clean Foundation also manages the Science Horizons Internship Program, which offers short-term employment to students aged 15 to 30 by providing subsidies to green employers as an incentive to hire young Canadians and offer them practical experience in green sectors.

Source: The Clean Foundation (2024), *Workforce Development: Supporting Canada's Clean Economy through Internship Programs*. <https://cleanfoundation.ca/workforce-development/> (accessed 8 July, 2024).

## Towards a strategy for green guidance

Effective programmes help students understand and progress toward green jobs by providing structured provision that strategically supports their career development. These programmes are based on the best available empirical evidence, engage with various employers and people in work, and address issues of equity and efficacy.

### **Rooting green guidance in effective career guidance**

Green guidance is best considered as a strand of general career guidance, rather than as a separate discipline. Consequently, considerable opportunity exists to draw on empirical research into wider career development. The most important tests of career guidance systems follow students from their school years into the labour market. Only through these means is it possible to assess whether guidance systems achieve their key (though not sole) objective: that students who engage in guidance gain new and additional resources of value which ultimately provide greater opportunity to secure more desirable employment than would be the case without such provision.

In the absence of large-scale randomised control trials which track teenage participants into the labour market, the best insights into the effectiveness of provision come from analysis of longitudinal datasets. The OECD has reviewed such datasets in 10 countries, identifying different forms of career development that can be most confidently associated with better ultimate employment outcomes. A range of specific forms of career development linked to how students can explore, experience and think about their potential futures in work were identified (Covacevich et al., 2021<sup>[17]</sup>).

In practice, effectively integrating green guidance into effective career guidance involves recognising the importance of helping students connect their education with the world of work from a young age. It also means enabling and encouraging students to explore potential career opportunities through authentic engagement with real-world work experiences in light of their emerging values, attitudes, skills and knowledge. Given the strength of student interest in environmental issues and in contributing to the fight against climate change, the most effective guidance systems will ensure that students have considerable



opportunity to build understanding of how such values relate to post-secondary education, training and employment.

### ***Enabling employer engagement***

As students engage more strongly in planning their futures through increasingly informed investment in education and training, it is essential to ensure that frequent opportunities are available for engagement with people working in relevant fields and their workplaces. In a vocational field undergoing rapid change, familial networks are less likely to provide access to trustworthy information about new and emerging employment opportunities. Effective guidance, on the other hand, has the advantage of authentic and expansive engagement with diverse employers, enriching student access to new and useful labour market information. Such school-age employer engagement is commonly associated with better long-term employment outcomes for young people (Covacevich et al., 2021<sup>[17]</sup>; Mann, Denis and Percy, 2020<sup>[22]</sup>). Through direct interactions, young people have the chance to clarify and inform their interests and begin building the qualifications, experience, skills and personal networks that can better enable progress towards desired career paths.

Mechanisms like classroom talks from external experts, career talks and career carousels with employee volunteers can be expected to enhance the likelihood that students will actively consider fields of employment linked with environmental sustainability. Through workplace visits, job shadowing and internships, students can gain further opportunity to confirm their interests, access up-to-date information and build relevant human and social capitals. To optimise employer engagement, intermediary organisations—whether local, regional or national—must be accessible, either in-person or virtual. These intermediaries facilitate schools in identifying individuals and workplaces that are well-placed to support student career development. It is the responsibility of governments to monitor the extent to which green sector employers are engaging with schools, intervening to enhance engagement whenever necessary.

### ***Equity in green guidance***

By their nature, green jobs are anticipated to offer greater long-term job security compared to brown jobs. Guidance systems can act to either promote equitable access to these desirable employment opportunities or exacerbate inequalities. This depends on whether they help to address or neglect the predictable barriers faced by specific social groups in understanding and progressing toward certain career paths (OECD, 2024<sup>[18]</sup>).

Effective programmes will reflect on possible additional challenges that different student groups may encounter. An example of a policy lever that can help remove barriers to student participation include subsidising career development activities through paid internships or providing tax incentives for employers. Such practices can significantly alleviate financial burdens for disadvantaged students and incentivise green employers to offer more opportunities to inexperienced youth interested in green jobs.

Digital resources are also important tools that can transcend geographic boundaries and school networks, enhancing access to information and experiences such as career talks or virtual work placements. Programmes that encourage students to explore fields where people with similar characteristics are underrepresented can help broaden their career horizons. For instance, effective initiatives that support girls to consider careers such as engineering begin early and involve meaningful interactions with women already established in these fields, prompting critical reflection on gender segregation within the labour market (OECD, 2024<sup>[18]</sup>).

### ***Data collection and evaluation***

To ensure the success and continual improvement of green guidance programmes, it is essential to develop more comprehensive data collection mechanisms. These mechanisms should systematically gather information on the outcomes and effectiveness of the programmes, providing empirical evidence on their impact. Detailed, longitudinal data can provide valuable insights into how well green guidance initiatives are performing and identify areas for improvement.

Data can facilitate evidence-based policy and decision-making, as well as inform the process for refining and improving green guidance strategies. This approach allows policymakers and guidance systems to make evidence-based decisions rather than assumptions, ensuring that provision can remain relevant, effective, and aligned with the evolving needs of students and the green job market. One important current challenge is the limited capacity of the ISCO-08 to identify green jobs. The current system complicates accurate and coherent measurement of green job growth as well as student interest in green jobs, undermining strategic delivery of effective career intervention programmes.

### **The bottom line**

While young people express strong interest in contributing to the global fight against climate change, employers are struggling to fill green jobs that advance environmental sustainability. Career guidance systems play a crucial role to bridge this gap by leveraging student interests and actively helping them understand and progress towards green careers. More effective systems will help students, from a young age, to explore, experience and think about potential future employment in green sectors. Around the world, education systems are introducing green guidance interventions, presenting considerable opportunity for peer learning within a coherent framework for career development.

# Career Readiness

This document was prepared by the Career Readiness team at the OECD.

The OECD Career Readiness project provides policy makers and practitioners with evidenced guidance on how schools can best prepare young people for employment during a period of economic disruption. The project makes particular use of results from the OECD Programme for International Student Assessment (PISA) and analysis of national longitudinal datasets.



**For more information, visit:** <https://www.oecd.org/education/career-readiness>

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**Key papers include:**

Chang, Y. and A. Mann (2024), "Enhancing green career guidance systems for sustainable futures", OECD Education Working Papers, No. 318, OECD Publishing, Paris, <https://doi.org/10.1787/e6ad2d9c-en>.

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