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# Global Guidance for Education on Green Jobs

Connecting Higher Education and Green  
Opportunities for Planetary Health

2021



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# Introduction

Over 200 million students are currently enrolled in the higher education system and this number is predicted to double by 2030. Yet, 71 million unemployed youth are currently struggling to find a job, a situation only exacerbated by the COVID-19 pandemic. The good news, however, is that the transition to a green economy will add an estimated 60 million new jobs to the market by 2030. According to the International Labour Organization (ILO), “The green transition can generate millions of jobs, but these are conditional on the availability of relevant skills and training.”<sup>1</sup>

The pressure that COVID-19 has put on educational and training institutions has already caused significant disruptions in education, including graduation delays and reductions of number of graduates for an unprecedented number of institutions. Recent improvements in reducing poverty are reversing, particularly among women and other marginalized groups.<sup>2</sup> As well as improving environmental health, an effective transition to a green economy will increase economic vibrancy and improve human well-being.

<sup>1</sup> ILO (2019). *Skills for a Greener Future: A Global View* pg. 188

<sup>2</sup> UNDESA (2020). *UN Sustainable Development Goals Report 2020* pg.40

# Audience and purpose

The primary audience for this Global Guidance document is the higher education community. However, other educators, non-governmental organizations (NGOs), governments, employers and youth organizations will find this document useful for strategic planning and collaborative efforts with higher education and each other. It provides an overview of the topic, with connections to many resources, and it includes key actions for educators preparing students to participate in the just transition to a green and more inclusive economy.

These actions are essential to prevent large-scale human suffering due to climate instability, ecosystem degradation and economic disruptions. This document also includes vetted resources for senior administrators, curricular developers, organizational staff, educators and employers.

## **JUST TRANSITION**

**“A JUST TRANSITION CREATES DECENT WORK OPPORTUNITIES FOR ALL AND ENSURES THAT SOCIAL PROTECTION EXISTS WHERE NEEDED. IT ALSO INCLUDES MECHANISMS FOR SOCIAL DIALOGUE FROM THE PRIVATE SECTOR AND WORKERS’ UNIONS THROUGHOUT POLICYMAKING PROCESSES AT ALL LEVELS.”<sup>3</sup>**

These key actions and resources support an emerging international trend in curricula and research to emphasize problem-solving for the SDGs. It builds upon preexisting strategies for education (e.g. UNESCO/ UNEVOC<sup>4</sup>) and the current work on greening the workforce (e.g. green jobs publications from ILO<sup>5</sup> and green jobs resources from the Partnership for Action on Green Economy – PAGE<sup>6</sup>). It also supports the fulfilment of national and international commitments and aligns with other resource documents (e.g. The Paris Agreement<sup>7</sup>, the UNESCO Integrating Action for Climate Empowerment into Nationally Determined Contributions<sup>8</sup>, and the UNESCO Education for Sustainable Development Roadmap<sup>9</sup>).

3 ILO (2017). [SDG Note: Green Jobs](#) pg. 12

4 [UNESCO/ UNEVOC](#)

5 [Green jobs publications from ILO](#)

6 [Green jobs resources from the Partnership for Action on Green Economy – PAGE](#)

7 [The Paris Agreement](#)

8 [UNESCO Integrating Action for Climate Empowerment into Nationally Determined Contributions](#)

9 [UNESCO Education for Sustainable Development Roadmap](#)



## Cross-sector collaboration

The science of climate change and ecosystem health demands bold and immediate changes to our societal norms. Green growth can be a pathway to inclusive prosperity.<sup>10</sup> To accomplish this, all sectors of society must expand on their previous roles and collaborate with each other. The education sector needs to work closely with businesses, governments, local communities, non-profit organizations and associations to co-create the vision and implement the plans, policies and processes required for an inclusive green economy. Higher education can act as a convener to encourage cross-sector collaboration.

<sup>10</sup> GGGI (2020). [The Promise of Green Growth: A Pathway to Prosperity While Achieving National and Global Ambitions](#)

These collaborations have the potential to produce the necessary financing, policies, market demand, and training and education of the new and existing workforce. This includes policymakers, investors and business leaders.<sup>11</sup> According to the United Nations General Assembly, “closer collaboration will also be required across Government ministries in order to devise integrated strategies encompassing public policies in the areas of education, youth, industrialization and rural development.”<sup>12</sup> Labour standards for companies are required to ensure green jobs are safe, have decent pay, and provide opportunities and pathways for career growth.<sup>13</sup> To maintain a healthy green entrepreneurship ecosystem, green entrepreneurship must be supported by all sectors.



11 Platform for Advancing Green Human Capital (2017). [Advancing Green Human Capital - A Framework For Policy Analysis And Guidance.](#)

12 Zabin, C. et. al. (2020) [Putting California on the High Road: A Jobs and Climate Action Plan for 2030.](#)

13 Decent Jobs for Youth (2019) [Thematic report on Growing Green - Fostering a Green Entrepreneurial Ecosystem for Youth](#)

# Three key actions

Higher education institutions of all types can help students reach their academic and professional potential via **three key actions**:



Across curricula in all majors and degrees, include environmental sustainability and learning outcomes related to growing an inclusive green workforce and economy. This will prepare students for the growing numbers of green jobs.<sup>14</sup> Such curricular updates will also help students make decisions that support an inclusive and green economy in their adult roles as consumers, community members, employees or employers, family members, and investors.



For educators and trainers: Through enhanced professional development, equip educators, trainers and other staff with the ability to teach students the competencies and skills required for green jobs.

For students: Through curricular updates, include change management competencies and specific green skills so students are prepared to green the local and global economies.



Strengthen ties between potential employers, educators and students to gain employers' input into curricular updates and increase job placements.

Resources for each of these key action areas are included in the following sections. We now have a crucial opportunity to create a more sustainable future. We must advance to greener education and workforce development for every country, by changing business-as-usual and building back better. This will help resolve our urgent unemployment issues while creating more equitable employment opportunities.



# Green jobs

ILO defines "green jobs" as decent jobs that contribute to, preserve, or restore the environment, whether they are in traditional sectors such as manufacturing and construction, or in newer and quickly growing green sectors such as renewable energy and energy efficiency. These jobs include the technicians educated through technical institutions and the business managers, marketers, financiers, engineers and others typically educated through universities. Green jobs help:

- improve energy and raw materials efficiency
- eliminate greenhouse gas emissions
- eliminate waste and pollution
- protect and restore ecosystems and human health
- support adaptation to the effects of climate change<sup>15</sup>





# Green job opportunities

Every country is well-suited to benefit from the opportunities of green jobs, which are growing more quickly than other jobs globally. Some of these quickly growing job areas with significant positive environmental impacts include:

## **Built environment: technology, energy, transport, buildings and infrastructure**

- Renewable energy sector employed 11.5 million people in 2019.<sup>16</sup> With added investment, jobs in renewables could reach 42 million by 2050, with another 21.3 million in energy efficiency and 14.5 million people in jobs related to power grids and energy flexibility.<sup>17</sup>
- Infrastructure sectors where energy services are key inputs include construction, transportation and sanitation.

## **Natural environment: agriculture, forestry, fisheries and watershed management**

- Organic farming, sustainable agriculture and green food manufacturing are more labour intensive than conventional production.
- Adoption of sustainable management practices accounts for 362–630 million of employment gains by 2050.<sup>18</sup>
- Sustainable agribusiness and fisheries help the entire value chain to be more innovative and sustainable through the use of climate-smart technology to mitigate and adapt to climate change, as well as sustainable procurement policy.

16 IRENA (2020). [Renewable Energy and Jobs – Annual Review](#)

17 IRENA (2020). [Global Renewables Outlook 2020](#)

18 FAO (2012). [Green Jobs for a Revitalized Food and Agriculture Sector](#)

## Sectors most affected by the transition to sustainability in the energy sector

Industries set to experience the highest job demand growth (absolute)		Industries set to experience the strongest job demand decline (absolute)	
Sector	Jobs (millions)	Sector	Jobs (millions)
Construction	6.5	Petroleum refinery	-1.6
Manufacture of electrical machinery and apparatus	2.5	Extraction of crude petroleum and services related to crude oil extraction, excluding surveying	-1.4
Mining of copper ores and concentrates	1.2	Production of electricity by coal	-0.8
Production of electricity by hydropower	0.8	Mining of coal and lignite, peat extraction	-0.7
Cultivation of vegetables, fruit, nuts	0.8	Private households with employed persons	-0.5
Production of electricity by solar photovoltaics	0.8	Manufacture of gas, distribution of gaseous fuels through mains	-0.3

Source: ILO, World Employment and Social Outlook 2018 - Greening with Jobs, 2018

GEO-6 for Youth<sup>19</sup> from UNEP looks at the green jobs that are likely to be part of the more sustainable world we are trying to build, how technologies are changing, and how a circular economy might change the type of jobs that are available. The soon-to-be-released Clean Energy Employment Assessment Tool<sup>20</sup> from the World Bank helps countries assess future direct and indirect job growth due to the emerging green economy.

<sup>19</sup> GEO-6 for Youth

<sup>20</sup> Clean Energy Employment Assessment Tool

# Green entrepreneurship

Many of the jobs necessary for an inclusive and green economy do not yet exist but can be created by green entrepreneurs. Such entrepreneurs have already created many career pathways: energy managers and energy auditors, solar photovoltaic manufacturers, clean cooking stove providers, and carbon offset retailers, to name a few. **Youth in the informal economy as well as students can be more successful in the green economy if they have learned entrepreneurship skills and an entrepreneurial mindset.**



A photograph of two scientists in a laboratory. A man on the left is wearing a white lab coat, safety glasses, and purple gloves, holding a white cylindrical object. A woman on the right is also in a white lab coat and safety glasses, looking up and smiling. The background shows laboratory equipment and pipes.

# Green lens for every job

There are hundreds of green and sustainability job categories that go beyond the solar designer or the wind generator installer that many people characterize as a green job. A quick job search shows tens of thousands of job postings, but there are more green jobs than existing job postings suggest.

Green jobs produce goods or provide services that benefit the environment or use fewer natural resources. This means any job that includes choices about how and which resources to consume can be a green job, from simple choices such as ordering office supplies to choosing energy sources and carrying out complex product development. "To reach the goal of creating an environmentally sustainable world, every job will eventually need to be green or at least greener."<sup>21</sup>

Students can bring their sustainability literacy to any job to help create a greener economy, acting as a **green intrapreneur for organizational change**. To be successful at greening a company, students need to understand how to *assess* the organization's formal and informal power structure as well as its products and processes, *find the opportunities* to shift the organization to greener practices and *build the coalition* of support necessary to *create the changes*.

**Helping students learn to be systems thinkers and effective change managers is a key component of quality education for a green economy.**

Further, students can help create an inclusive and green economy when their education prepares them to **apply this knowledge not only to their professions but also within their adult roles as consumers, voters, community members and investors.**

# Resources for actions

What can higher education do now?



This section explains what universities, Technical and Vocational Education and Training (TVET) institutions and other educators can do. Employers, NGOs, governments and youth organizations will also find this information useful.

The strategies and resources below help implement the three key actions, build student interest in green and sustainability jobs, grow student talent to build a sustainable future, and connect them to job opportunities. Many of the suggested resources also include promising practices from leading institutions. Students can simultaneously build their employability skills and contribute to the sustainable development solutions, thereby producing a healthier economy and environment and improved social well-being.



**Curricular content changes:** Integrate environmental sustainability concepts and green career pathways information throughout the curricula and co-curricular programming in TVET institutions and universities so that *all* students understand the urgent sustainability issues and have the knowledge and motivation to create and participate in solutions. This knowledge and motivation includes:

- **SDGs and green economy core concepts:** Students understand the SDGs and the potentials for an inclusive green economy as part of the reorientation framework. There are many resources available to educators e.g. Education for Sustainable Development Goals: learning objectives,<sup>22</sup> Introduction to Green Economy,<sup>23</sup> UNESCO-UNEP-ILO Youth Xchange: Green Skills and Lifestyles Guidebook.<sup>24</sup>
- **Self-concept and motivation:** Students continue to build their sense of who they want to be in the world during their higher education experience. If they aspire to help build an inclusive, sustainable and green economy, they will use the knowledge productively. Educators need to address this explicitly to provide students with the necessary motivations.

**Professional development offerings:** Provide materials, professional development opportunities, and incentives for faculty and other relevant staff to get involved in environmental sustainability and green jobs, including but not limited to the teaching of specific sets of green skills. Utilize materials from UN CC: Learn,<sup>25</sup> PAGE - Learning for a Green Recovery,<sup>26</sup> SDG Academy - Work and Employment for a Sustainable Future,<sup>27</sup> the UNEVOC,<sup>28</sup> the Sustainability Education and Economic Development Resource Center (SEED Center),<sup>29</sup> Accelerating Education for the SDG in Universities (SDSN),<sup>30</sup> UVED (Virtual University of Environment and Sustainable Development, France)<sup>31</sup> and others. Your faculty and staff can sign up for upcoming webinars and a discussion series providing some of this professional development.

22 [Education for Sustainable Development Goals: learning objectives](#)

23 [Introduction to Green Economy](#)

24 [UNESCO-UNEP-ILO Youth Xchange: Green Skills and Lifestyles Guidebook](#)

25 [UN CC: Learn](#)

26 [PAGE - Learning for a Green Recovery](#)

27 [SDG Academy - Work and Employment for a Sustainable Future](#)

28 [UNEVOC](#)

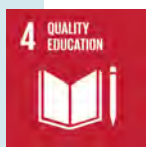
29 [Sustainability Education and Economic Development Resource Center \(SEED Center\)](#)

30 [Accelerating Education for the SDG in Universities \(SDSN\)](#)

31 [UVED - Virtual University of Environment and Sustainable Development, France](#)

## Green Jobs and the Sustainable Development Goals (SDGs)

All aspects of green economy and just transition are interrelated to sustainability challenges and therefore to the Sustainable Development Goals. Correspondingly, green jobs have several direct and indirect connections with these Global Goals. Some of them are explored below:



**SDG 4** supports the promotion of Green Jobs especially for having dedicated targets to the promotion of technical and vocational skills for employment, decent jobs and entrepreneurship, as well as to ensure that the knowledge and skills acquired promote sustainable development.



Renewable energy and energy efficiency are among the main sectors discussed for a greener economy and for opportunities for green jobs. **SDG 7** has specific targets to promote these aspects along with improved energy access, expanded infrastructure and upgraded technology.



In addition to committing to entrepreneurship and to the creation of decent jobs for all, **SDG 8** also supports green jobs for focusing on improving global resource efficiency in consumption and production.



Making cities and communities more sustainable (**SDG 11**) encompasses multiple aspects, such as sustainable transport systems, sustainable urbanization and management, and implementation of policies on resource efficiency, climate action and resiliency – all opportunities to be covered by green jobs.



Improving raw materials efficiency and eliminating waste and pollution are among the expected outcomes of green jobs, as well as of the core aims of sustainable production and consumption (**SDG 12**).



Green jobs are concerned with the impacts of climate action while promoting adaptation and mitigation strategies. **SDG 13** focused on Climate Action and has targets to support these connections – including capacity and awareness-raising.

Additional related SDG connections were explored [here](#). Full list of SDGs and targets can be seen [here](#).



**Career advising:** Share how bringing a green lens to any job is worthwhile and necessary, and provide resources on career pathways and job posting sites to career advisers, teaching staff and students (e.g. [Green and Sustainability Jobs: Careers Resources](#)).<sup>32</sup>

**Standards and accreditation:** Work with academic societies and professional associations to integrate green topics into requirements for the major and accreditation criteria. Examples include [accreditation in engineering](#) and the [Disciplinary Associations Network for Sustainability](#).<sup>33</sup>

**Institutional alignment:** Adapt performance appraisal criteria for senior administrators and other key positions to include the integration of environmental sustainability into tertiary education. Designed by over a dozen professional associations in higher education, this [primer](#) provides descriptions and examples of what senior administrators can accomplish. The [Higher Education Associations Sustainability Consortium](#)<sup>34</sup> calls for sustainability to be integrated into job descriptions and performance appraisals.

**Institutional assessment:** Utilize assessment tools to guide the institutions' actions regarding green workforce development, such as the [Green Genome self-assessment](#)<sup>35</sup> and the [Greening TVET Monitoring and Assessment Framework](#).<sup>36</sup> These assessments (in the appendices of these two resources) cover what an integrated approach to sustainability, greening the workforce and economic development would look like, and how a college would know whether it was making progress towards long-term systemic change. While originally designed for TVET institutions/community colleges, these assessments include a whole-institution approach and apply to all higher education institutions.

32 [Green and Sustainability Jobs: Careers Resources](#)

33 [Disciplinary Associations Network for Sustainability](#)

34 [Higher Education Associations Sustainability Consortium](#)

35 [Green Genome self-assessment](#)

36 [Greening TVET Monitoring and Assessment Framework](#)



## Curricular changes

- **Change agent competencies:** Update all existing curricula and design new curricula that include within the learning outcomes the competencies needed to be an effective change agent for the SDGs and the creation of an inclusive, green economy.

While TVET institutions and universities must both teach specific skills for green jobs, universities have a crucial role in helping students become change agents to create the transitions we urgently need.

A rich literature on this topic is creating an emerging consensus calling for the following key competencies to be taught across all academic disciplines: Strategic-thinking, Values-thinking, Futures-thinking, Systems-thinking, Integrated problem-solving, Interpersonal and Intrapersonal.<sup>37</sup> Students need to learn about climate change and other SDG topics in ways that build their agency for effective action. Applied at scale, this will shift the conceptualization of education outcomes from being "issue-based" to "action-based".<sup>38</sup> Educators also need to better develop, train and support students to conduct societally relevant research.<sup>39</sup>

- **Civic engagement:** Include civic engagement in curricula so students understand how to advocate for organizational and governmental policies necessary for the transition to an inclusive green economy e.g. GEO-6 for Youth,<sup>40</sup> Green Growth Knowledge Platform,<sup>41</sup> Teach the Future,<sup>42</sup> Beyond Doom and Gloom: Climate Solutions,<sup>43</sup> Green Industrial Policy: Concept, Policies, Country Experiences.<sup>44</sup>

37 Brundiers, K., Barth, M., Cebrián, G. *et al.* (2021). [Key competencies in sustainability in higher education—toward an agreed-upon reference framework](#). *Sustainability Science*, 16, 13–29.

38 De Meyer, K. *et al.* (2021). [Transforming the stories we tell about climate change: from 'issue' to 'action'](#). *Environmental Research Letters*, 16(1), 015002.

39 Rozance, M. A. *et al.* (2020). [Building capacity for societally engaged climate science by transforming science training](#). *Environmental Research Letters*, 15(12), 125008.

40 [GEO-6 for Youth](#)

41 [Green Growth Knowledge Platform](#)

42 [Teach the Future](#)

43 [Beyond Doom and Gloom: Climate Solutions](#)

44 [Green Industrial Policy: Concept, Policies, Country Experiences](#)

- **Green jobs skills:** Update (and design new) curricula to include skills needed for green jobs utilizing employer input and related publications e.g. green jobs publications from ILO,<sup>45</sup> Skills for a Greener Future: A Global View,<sup>46</sup> Powering Jobs Census: 2019<sup>47</sup> from Power for All, Clean Energy Workforce US,<sup>48</sup> Knowledge and Skills Statements for Greening Career Clusters,<sup>49</sup> and Green Industrial Skills for Sustainable Future<sup>50</sup> from UNIDO. It is important to reduce a skills and jobs mismatch. Include ongoing updates of changes in job skills via job task analyses and information from labor and employer groups. It is important to communicate with local employers to clarify what skills are desired. For example, some solar and wind employers want students to learn basic mechanical, electrical and safety skills for initial employment, and complete the rest of the training within the company.

In addition to communications on skill needs, it is equally important for students to be able to test their skills and improve them so that they become highly qualified graduates ready for employment. For example, within the Learning and Knowledge Development Facility<sup>51</sup> (LKDF), UNIDO runs projects that set up training programmes, in cooperation with public and private sectors to ensure the skills are developed and tested on the job. This approach has proven to offer a long-term impact in ensuring skill matches.

Incorporate information on present and projected skills shortages for both teachers and students. Learning happens throughout life, after formal education. Learning is about changes that we face every day and how we foster knowledge while developing individual skills. Therefore, trainings of trainers ensure future generation are taught effectively and strategically with up-to-date knowledge and trainings.

Teach students the specifics of how to help grow the inclusive, green economy e.g. Green Finance Platform,<sup>52</sup> Solar jobs task analysis for North America,<sup>53</sup> and Skills development for renewable energy and energy efficient jobs,<sup>54</sup> Leveraging skills to build on existing industries<sup>55</sup> and Knowledge/skills for a circular economy.<sup>56</sup>

Teach students the specific skills related to their career pathway at all TVET and technical/training institutions with a whole-institution approach i.e. Greening technical and vocational education and training: a practical guide for institutions,<sup>57</sup> and Green skills and innovation for inclusive growth.<sup>58</sup> While designed for the TVET institutions, these documents are also applicable to universities.

45 [Green jobs publications from ILO](#)

46 [Skills for a Greener Future: A Global View](#)

47 [Powering Jobs Census: 2019](#)

48 [Clean Energy Workforce US](#)

49 [Knowledge and Skills Statements for Greening Career Clusters](#)

50 [Green Industrial Skills for Sustainable Future](#)

51 [Learning and Knowledge Development Facility](#)

52 [Green Finance Platform](#)

53 [Solar jobs task analysis for North America](#)

54 [Skills development for renewable energy and energy efficient jobs](#)

55 [Leveraging skills to build on existing industries](#)

56 [Knowledge/skills for a circular economy](#)

57 [Greening technical and vocational education and training: a practical guide for institutions](#)

58 [Green skills and innovation for inclusive growth](#)

- **Entrepreneurship:** Include green entrepreneurship skills in curricula e.g. Start and Improve Your Business Programme<sup>59</sup> and Green Business Booklet<sup>60</sup> by ILO, Addressing climate challenges with innovation<sup>61</sup> by WIPO, Youth Employment and Entrepreneurship<sup>62</sup> by UNEVOC, How to Start an Eco-Friendly Small-Scale Business<sup>63</sup> by WWF, [MOOC](#) based on the Handbook and Workbook for Green Entrepreneurs in the Mediterranean by UNDP, Women Entrepreneurs as Key Drivers in the Decentralised Renewable Energy Sector: Best Practices and Innovative Business Models<sup>64</sup> by ARE, A Handbook for Energy Entrepreneurs<sup>65</sup> by UNEP.

**Pedagogy:** Use applied projects and applied research as high-impact learning practices:

- **Focus on solutions:** Utilize the Key Components of Quality Assignments.<sup>66</sup> Help faculty and staff improve student learning by creating applied projects and research assignments relevant to existing real world green economy issues.

- **Transdisciplinary:** Include interdisciplinary approaches and use the campus and communities as a living laboratory to help develop the green and inclusive economy.

- **Applied learning:** Equip students with opportunities to apply skills and knowledge necessary to pursue green careers via real world projects and applied research, connected to communities and employers using models like Educational Partnerships for Innovation in Communities<sup>67</sup> with specific projects (e.g. helping a heating, ventilation, and air-conditioning company start a solar division, conducting energy audits for businesses and NGOs, providing and/or assessing the effectiveness of workshops for the community on mitigating/adapting to climate change). The international version of For Good<sup>68</sup> connects real-world projects with interested students

- **Institutional incentives:** Create reward structures for more applied learning and applied research (e.g. value applied research journals and pedagogy for applied projects more in credit towards tenure and promotions).

59 [Start and Improve Your Business Programme](#)

60 [Green Business Booklet](#)

61 [Addressing climate challenges with innovation](#)

62 [Youth Employment and Entrepreneurship](#)

63 [How to Start an Eco-Friendly Small-Scale Business](#)

64 [Women Entrepreneurs as Key Drivers in the Decentralised Renewable Energy Sector: Best Practices and Innovative Business Models](#)

65 [A Handbook for Energy Entrepreneurs](#) (please note the annexes are outdated in this otherwise useful document)

66 [Key Components of Quality Sustainability Assignments](#)

67 [Educational Partnerships for Innovation in Communities](#)

68 [For Good](#)



**Advising on career pathways:** Have faculty advisers and career advisers/offices share with students information about: 1) green career pathways, 2) bringing a green lens to any job, and 3) entrepreneurial opportunities e.g. Green and Sustainability Jobs: Career Resources<sup>69</sup> and Sustainable Energy Jobs Platform.<sup>70</sup>

- **Advisor trainings:** Periodic trainings of career advisers are profitable for not only for advisers but also for institutions and students. When advisers are up-to-date with pressing global issues and job market trends, they are able to provide optimized guidance to students.

- **Skills awareness:** Organise a “Skills day for Green Economy” – invite professionals, as well as programme alumni or others who are representative of the institution’s student body in technical sectors as guest speakers and workshop leaders.

- **Access to job listings:** Provide job listing sites eg. green and sustainability job sites and career resources.<sup>71</sup>

- **Green careers resources:** Provide resources to explore green jobs, skills/competencies, and career pathways e.g. IRENA’s Renewable Energies and Jobs - Annual Review,<sup>72</sup> The Sustainability Education and Economic Development (SEED) Resource Center,<sup>73</sup> Nature Hires: How nature-based solutions can power a green jobs recovery.<sup>74</sup>

69 [Green and Sustainability Jobs: Career Resources](#)

70 [Sustainable Energy Jobs Platform](#)

71 [Green and sustainability job sites and career resources](#)

72 [IRENA’s Renewable Energies and Jobs - Annual Review](#)

73 [The Sustainability Education and Economic Development \(SEED\) Resource Center](#)

74 [Nature Hires: How nature-based solutions can power a green jobs recovery](#)

- **Gender disparity:** IRENA's survey on women in renewables found that women represent only 32 per cent of the renewable energy workforce. Of this, 45 per cent are in administrative roles, 35 per cent in non-STEM (science, technology, engineering, and mathematics) technical roles and only 28 per cent in STEM jobs. Addressing this requires targeted actions including scholarships, mentoring, and early exposure for girls well before they reach higher education.<sup>75</sup>

Feature resources for women to close the gender gap in clean energy and green economy careers e.g. Women at the Forefront Programme,<sup>76</sup> Women Take Next Step for Energy Sector Leadership,<sup>77</sup> African Women in Energy Development Initiative,<sup>78</sup> Women of Renewable Industries and Sustainable Energies,<sup>79</sup> Powering Equality: Women's Entrepreneurship Transforming Asia's Energy Sector.<sup>80</sup>

- **Entrepreneurship:** Feature resources that demonstrate green entrepreneurship e.g. Meet the Entrepreneurs Leading the Transition to a Green Economy.<sup>81</sup>

- **Communications:** Signpost on campus so that people can explore and understand the need for students to be educated for green jobs e.g. Green and Sustainability Jobs Poster<sup>82</sup> and Ecoleaders Career Center Poster.<sup>83</sup>



75 IRENA (2019), [Renewable Energy: A Gender Perspective](#), IRENA, Abu Dhabi.

76 [Women at the Forefront Programme](#)

77 [Women Take Next Step for Energy Sector Leadership](#)

78 [African Women in Energy Development Initiative](#)

79 [Women of Renewable Industries and Sustainable Energies](#)

80 [Powering Equality: Women's Entrepreneurship Transforming Asia's Energy Sector](#)

81 [Meet the Entrepreneurs Leading the Transition to a Green Economy](#)

82 [Green and Sustainability Jobs Poster](#)

83 [Ecoleaders Career Center Poster](#)

## Student – employer – faculty connections:

- **Career days and apps:** Organize opportunities for students to learn about green career pathways by meeting potential employers and engaging with programme alumni as role models and for networking. Provide broader access to this information 24/7 via mobile phone apps.
- **Employer engagement:** Organize recruiters' visits to campus to promote green job opportunities, enhance job placements and continuously improve curricula. Help employers understand how to connect effectively with higher education e.g. ways employers can connect.<sup>84</sup>
- **Apprenticeships etc.:** Increase the number of apprenticeship opportunities, on-the-job learning and internship opportunities related to green careers.
- **Job shadowing:** Organize accredited job shadowing programmes between students and employers.
- **Green businesses development:** Offer workshops and convene conferences for business owners about how to grow their business and improve their profits by going green. Have trade associations, Chambers of Commerce and local governments co-host. Students can make professional connections and help businesses develop their green potentials during subsequent applied learning and research projects.
- **Coaching by alumni in green positions:** Experience speaks louder than words. Alumni with successful pathways in green positions are well-suited to direct students towards green opportunities.

**Curricular – career connections:** "Successful human resources development will require better connections between education and employment so as to turn qualifications into jobs."<sup>85</sup> Curricular and programme developers should include the projected jobs in a growing green economy and the anticipated skill sets required when designing curricula. University leaders can develop an important interface between future-oriented employers, program alumni and curricular developers to facilitate an ongoing dialogue to advance these new skill sets. Utilizing a tripartite system that incorporates government, future-oriented businesses, and organized labour can develop a curriculum that is responsive to the needs of firms and create pathways to sustainable livelihoods.

<sup>84</sup> [Ways employers can connect](#)

<sup>85</sup> UN General Assembly Document A/72/292 (UNGA, 2017). [Human resources development for the twenty-first century](#) - Report of the Secretary-General pg. 16

# Invitation

By sharing these opportunities and utilizing the above resources, we can build back better and address both environmental health and youth unemployment through our higher education and workforce development systems. To complement these resources, UNEP is facilitating a Community of Practice for Greening the Workforce with webinars and international virtual discussion meetings for educators, administrators and youth. Additional resources, best practices from countries, institutions and educators, success stories, and solutions to barriers will be discussed during these virtual meetings. Please sign up [here](#) for more information.

Congratulations on all your efforts to help build a more inclusive green economy.

Please contact UNEP-YEA ([unenvironment-yea@un.org](mailto:unenvironment-yea@un.org)) for more information and assistance.

