



# Promoting Equitable and Inclusive Green Job Growth in Southeast Asia

By Xueling Lee, Chris Addy, Roger Thompson, and Rose Farah

ASEAN nations have a breakthrough opportunity to drive a just transition to a green economy. The key will be workforce development that paves the way for underserved communities to access green jobs.

# Table of Contents

---

Executive Summary .....	2
-------------------------	---

## SECTION 1

---

Introduction.....	5
-------------------	---

## SECTION 2

---

Sectors with the Highest Potential for Green Jobs .....	10
Solar .....	12
Built Environment.....	13
Sustainable Farming.....	15
Electric Mobility.....	17
Waste Management.....	19

## SECTION 3

---

Green Jobs with Highest Employment Potential.....	21
---	----

## SECTION 4

---

Overcoming Barriers to Green Jobs .....	24
Governments.....	26
Funders and NGOs .....	29
Employers.....	34
Investors.....	38

## SECTION 5

---

The Green Road Ahead.....	41
---------------------------	----

## SECTION 6

---

Organisation Profiles .....	43
Generation: Market-Driven Employment Support for Underserved Students.....	43
An Giang Vocational College: Vocational Training for Women and People with Disabilities.....	45
ASSIST: NGO Collaborates with Employers to Design Green-Skills Training.....	46

## SECTION 7

---

Appendix.....	49
Overview of Six ASEAN Markets.....	49
High-Potential Jobs by Sector.....	50
Solar .....	50
Built Environment.....	51
Sustainable Farming.....	52
Electric Mobility .....	53
Waste Management.....	54

Cover photos: (far left) THINK b; (second from left) Koronowo; (middle) DjunaPix; (second from right) piyaphunjun; (far right) David Brown

# Executive Summary

---

The transition to a green economy offers a bright future for Southeast Asia. It's not only a US\$1 trillion market opportunity by 2030 across the region's economies. It's also a pathway to a sustainable future, one that is resilient to the climate crisis, more secure for nations, healthier for residents, and inclusive for all.

This bold future, which could generate upwards of 30 million green jobs, hinges upon workforce development on an assertive scale. It will take a coordinated mix of new policies, programmes, practices, and investments to train that many workers, including those from traditionally underserved communities, and provide them access to emerging green jobs.

To guide this radical transformation, we studied employment markets across six countries—Indonesia, Malaysia, the Philippines, Singapore, Thailand, and Vietnam—and conducted 80 interviews with employers, researchers, and nongovernmental organisations (NGOs). This report, supported by J.P. Morgan, identifies steps that leaders across sectors—governments, funders, NGOs, investors, and employers—can take to ensure the emerging green economy achieves a “just transition” that leaves no one behind.

Practically speaking, that means green jobs that provide a living wage, safe working conditions, appropriate employee benefits, and equitable treatment for all workers. It also

means reaching underserved individuals and communities, including those who have historically been marginalised because of their gender or rural location, for emerging green employment opportunities.

We identified 30 entry-level jobs in five sectors that are key to the green economy transition: solar, electric mobility, built environment, sustainable farming, and waste management. Some of those green jobs are in traditional sectors (e.g. manufacturing and construction) and others are in emerging green sectors (e.g. renewable energy and electric mobility). All require green-skills training and changes in business practices. Thus, the spotlight is on workforce development programmes, the organisations that deliver them, and the sectors that will benefit from them.

As ASEAN governments align their environmental sustainability plans with their workforce development policies, they can turn to examples we've provided of existing programmes that build the educational, training, and job-quality foundations they'll need. This report also proposes recommendations to ensure that green jobs are

accessible to underserved communities in three categories, with specific takeaways for policymakers, business leaders, investors, and NGO heads:

- **Coordinate green job and skills data and definitions.** Facilitate data sharing using common definitions of green jobs and skills amongst stakeholders, such as industry associations and job training organisations, and across countries in the region. This would enable leaders to focus on “hot spots” that would make the biggest difference on local and national levels.
- **Improve accessibility.** Bridge demand-supply gaps by connecting green job vacancies with potential employees, develop equitable hiring processes, and help individuals acquire skills to aid job placement. This includes not only specific green-skills training

and job-readiness supports, but also on-ramps for underserved communities to enter the green economy.

- **Improve job quality with economic benefits.** Ensure green jobs pay a living wage and provide safe working conditions along with social protection benefits such as medical insurance and unemployment protection.

Only by having a workforce prepared to fill jobs that will flourish in a green economy can Southeast Asian nations achieve their commitments to carbon neutrality. They face the added challenge of ensuring green jobs are accessible to underserved individuals and communities. A just transition will lead to more equitable and sustainable economies. There’s plenty of work ahead—and no time to waste to build a green economy that works for all.



SECTION 1

# Introduction



# Introduction

---

Southeast Asian economies have initiated ambitious transitions to green economies. Nine of the 10 members of the Association of Southeast Asian Nations (ASEAN) have committed to net-zero greenhouse-gas emissions targets<sup>1</sup>—not only to respond to the climate crisis, but also to spur up to US\$1 trillion in annual economic opportunities by 2030.<sup>2</sup>

The transition to sustainable and climate-friendly growth is a historic opportunity to restore economic development—at a time when it’s needed most, given the adverse economic effects of the COVID-19 pandemic. The resulting “green economy,” as the United Nations Environment Programme describes it, “can be considered as one that is low in carbon, resource-efficient, and socially inclusive.”<sup>3</sup> That kind of structural change to pre-pandemic business as usual would be a breath of fresh air.

Under optimal conditions, transitioning to a green economy could create 30 million jobs across Southeast Asia by the end of the decade.<sup>4</sup> Yet those conditions are predicated on putting new policies, programmes, practices, and investments in place, including those that ensure green jobs are accessible to historically underserved individuals and communities.

While the characteristics of underserved individuals vary across ASEAN countries, for this report, we consider individuals who fall below their nation’s poverty line and who have historically been marginalised because of their gender, employment status in the informal economy, or rural location. They have often been excluded from bringing their full skills, knowledge, and experiences to formal employment settings. And their communities are more vulnerable to the risks and hazards associated with environmental degradation—which will only get more extreme in a region that is increasingly vulnerable to rising sea levels, heat waves, floods, and droughts made worse by the climate crisis.

Globally, the International Labour Organization (ILO) and other green-economy champions advocate a *just transition* “that is as fair and inclusive as possible to everyone

---

1 Cecillia Zheng, “[Which ASEAN Countries Will Be the Front-Runners to Decarbonize Their Power Sectors?](#),” S&P Global Commodity Insights, 24 August 2022.

2 Dale Hardcastle and Gerry Mattios, [Southeast Asia’s Green Economy: Pathway to Full Potential](#), Bain & Company, November 2020.

3 “[Green Economy](#),” UN Environmental Programme.

4 Asian Development Bank, [Implementing a Green Recovery in Southeast Asia](#), May 2022.

concerned [and] create[s] decent work opportunities.”<sup>5</sup> Practically speaking, that means green jobs should not only be accessible to all, but also offer a living wage, safe working conditions, appropriate employee benefits, and equitable treatment.<sup>6</sup> This is admittedly a high bar, but it is within reach. (See “[What Is a Green Job?](#)”)

For their part, ASEAN nations have joined with the ILO to support policy frameworks that promote green jobs *and* a just transition.<sup>7</sup> For example, the [ASEAN Declaration on Promoting Green Jobs for Equity and Inclusive Growth of ASEAN Community](#) and the [ASEAN Economic Community Blueprint 2025](#) recognise the links amongst economic development, environmental protection, and a just transition.

Our analysis, however, found that, to date, little attention has been given to how to prepare underserved individuals and communities, or those displaced by a greening economy, for emerging green employment opportunities. In this report, supported by J.P. Morgan, we lay out specific steps that governments, funders, nongovernmental organisations (NGOs), investors, and employers can take to ensure the emerging green economy leaves no one behind.

We identify employment sectors with the highest potential to create green jobs and the entry-level jobs within those sectors that likely will require green skills. (Potential “brown” job losses are also important to understand more fully but lie beyond the scope of this report.) Our research spanned six ASEAN countries—Indonesia, Malaysia, the Philippines, Singapore, Thailand, and Vietnam—and included some 80 interviews with employers, researchers, and NGOs. The five most promising sectors were solar, electric mobility, built environment, sustainable farming, and waste management. Across these sectors, we found more than 30 entry-level positions with high employment potential for those with green skills.

Only in the past decade or so have ASEAN governments begun to align their environmental sustainability plans with their workforce development policies, including through training programmes and through data collection and analysis (e.g. where are the existing jobs and what do they pay?). Stakeholders can consider the policy suggestions and examples of existing programmes in Tables 1–4 on [pages 26–39](#) as they build the educational, training, and job-quality foundations of their emerging green economies.

---

5 International Labour Organization, “[Frequently Asked Questions on Just Transition](#).”

6 International Labour Organization, [Green Jobs and a Just Transition for Climate Action in Asia and the Pacific](#), 2019.

7 Association of Southeast Asian Nations and the International Labour Organization, [Regional Study on Green Jobs Policy Readiness in ASEAN: Final Report](#), 30 June 2021.

## What Is a “Green Job”?

For this report, we followed the lead of two recognised authorities in scoping what constitutes a “green job.” The International Labour Organization (ILO) defines green jobs as “decent jobs” that contribute to preserving or restoring the environment, whether “in traditional sectors such as manufacturing and construction, or in new, emerging green sectors such as renewable energy and energy efficiency.”<sup>8</sup>

The Asian Development Bank similarly describes green jobs as those:

“that reduce the environmental impact of enterprises and economic sectors, ultimately to levels that are sustainable. This comprises work in agriculture, industry, services (such as waste management), and administration that contributes to preserving or restoring the quality of the environment while also meeting the requirements of decent work, involving adequate wages, safe conditions, workers’ rights, social dialogue, and social protection.”<sup>9</sup>

The “greenness” of a job is measured on a sliding scale. “The term ‘green’ should be considered a continuum

rather than a binary characteristic,” concluded researchers who examined the characteristics of green employment.<sup>10</sup> Thus, traditional occupations that have added new skills, such as electricians who now install high-efficiency heating, ventilation, and cooling systems, or mechanics who service electric vehicles, are likely to comprise most of green employment (see [Figure 1](#)).

For green jobs to be “decent” jobs, they must offer a living wage, safe working conditions, and appropriate benefits. Amongst green-economy proponents, decent work has taken on specific meaning as championed by the ILO. The [ILO’s Decent Work Agenda](#) promotes “opportunities for work that is productive and delivers a fair income, security in the workplace, and social protection,” aspirations that the UN has also embraced in its 2030 Sustainable Development Goals. For this report, we focus on three policy areas the ILO lists as key: occupational health and safety policies intended to eliminate significant risks; economic benefits, including good wages and stable employment; and social protections, such as benefits for unemployment, maternity care, childcare, sickness, and disability, as well as pensions and other social assistance.

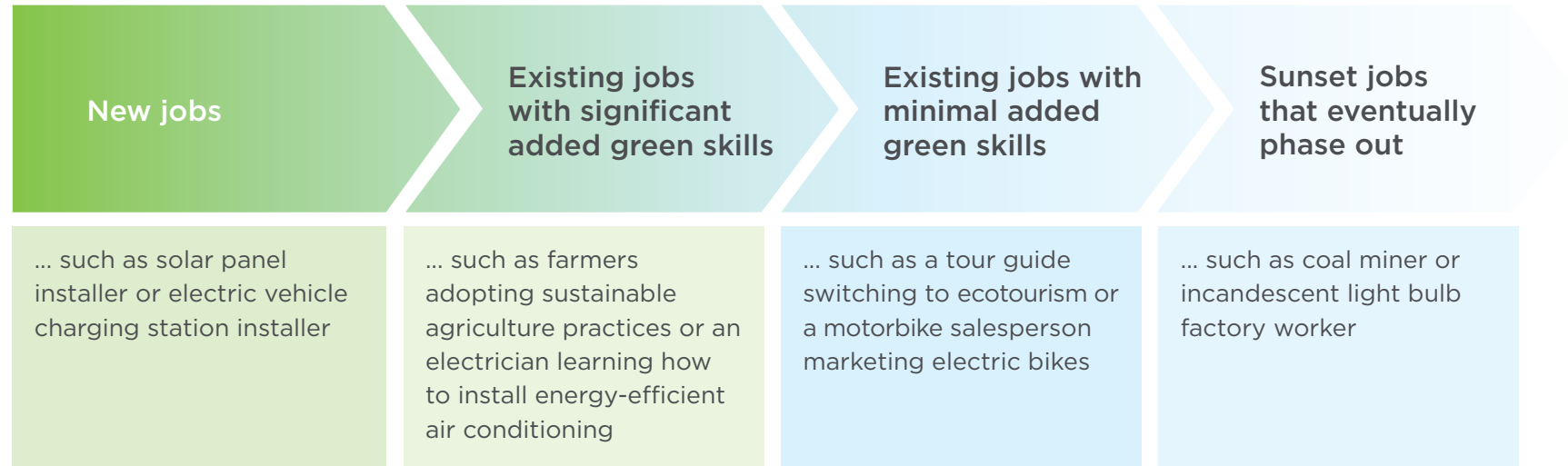
8 International Labour Organization, “[What is a Green Job?](#)” 13 April 2016.

9 Brajesh Panth and Rupert Maclean, eds., [Anticipating and Preparing for Emerging Skills and Jobs: Key Issues, Concerns, and Prospects](#), Asian Development Bank, November 2020.

10 Alex Bowen, Karlygash Kuralbayeva, and Eileen L. Tipoe, “[Characterising Green Employment: The Impacts of ‘Greening’ on Workforce Composition](#),” *Energy Economics* 72 (May 2018): 263–275.



**Figure 1: Jobs Are Impacted by the Green Economy in Multiple Ways**



Source: The Bridgespan Group





SECTION 2

# Sectors with the Highest Potential for Green Jobs

# Sectors with the Highest Potential for Green Jobs

To identify sectors with the greatest green-jobs growth potential, we considered three factors: abatement potential for carbon emissions; potential for economic growth, as measured by government policy commitment and attractiveness to the private sector, especially the largest companies; and estimated total employment projections in both non-green and green jobs (see [Figure 3](#)).

While the five sectors named below (see Figure 2) emerged as green-economy job leaders (see the [Appendix](#) for more on their employment possibilities), other sectors also have high potential, such as wind energy, sustainable tourism, and climate adaptation. Our findings on how to improve access to green jobs for underserved individuals may be relevant to these sectors as well. On the following pages, we explore these sectors and their promise.

**Figure 2: Five High-Priority Green Sectors**



**Solar**



**Built Environment**



**Sustainable Farming**



**Electric Mobility**



**Waste Management**

Source: The Bridgespan Group

### Figure 3: High-Priority Green Sectors with Significant Employment Potential

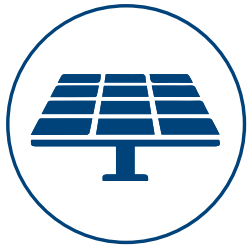
Green sectors capable of generating \$150 billion in economic opportunity and high employment across six ASEAN nations

High growth and employment potential
  Medium growth and employment potential
  Low growth and employment potential

Sectors	Economic opportunity by 2030* (US\$)	Indonesia	Malaysia	Philippines	Singapore	Thailand	Vietnam
Solar	~\$20B						
Built Environment	~\$40B						
Sustainable Farming	~\$30B						
Electric Mobility	~\$50B						
Waste Management	~\$10B						

\*Revenue across value chain, with exception of waste management, which is calculated based on cost required for managing municipal solid wastes in key markets.

Sources: The Bridgespan Group (waste cost analysis); and Dale Hardcastle, Gerry Mattios, Emily Wu, and Frederick Teo, [Southeast Asia's Green Economy 2022 Report: Investing Behind New Realities](#), Bain & Company, 7 June 2022.



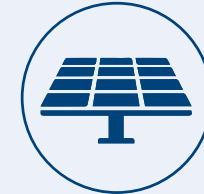
## Solar

Southeast Asia has experienced rapid growth in solar capacity, which doubled from 10.4 gigawatts to 22.9 gigawatts between 2019 and 2020.<sup>11</sup> (To put that

into perspective, 22.9 gigawatts is enough generating capacity to have powered half of Thailand's electricity needs in 2019.) Widespread adoption of solar power has the potential to produce US\$20 billion in annual revenue in the region by 2030, according to Bain & Company's *Green Economy 2022 Report* for Southeast Asia.<sup>12</sup>

Solar adoption thus far is uneven. Amongst the six ASEAN nations in our study, 71 percent of total installed solar power is in Vietnam, which has used generous tax incentives to promote home solar panel installations. Even so, all have announced commitments to increase solar capacity by 2030, with Malaysia, Thailand, and Vietnam poised for greatest growth due to their sizable solar manufacturing sectors.

The jobs outlook for this sector in the near term appears strong. According to estimates, solar will account for more than half of all renewable energy jobs across Southeast Asia by 2025.<sup>13</sup> Manufacturing and ongoing operations and maintenance will account for most of the solar job growth. Renewable energy experts specifically point to high employment potential for jobs that typically require upgraded skills, such as solar panel installers and technicians.



**Solar**  
represents a

**US \$20**  
**billion**

**annual revenue**  
**opportunity by 2030**

**Source:** Dale Hardcastle, Gerry Mattios, Emily Wu, and Frederick Teo, *Southeast Asia's Green Economy 2022 Report: Investing Behind New Realities*, Bain & Company, 7 June 2022.

11 Prabaljit Sarkar, "[What Investors Need to Know About Southeast Asia's Solar Energy Boom](#)," Schrodgers.com, 3 September 2022.

12 Dale Hardcastle, Gerry Mattios, Emily Wu, and Frederick Teo, *Southeast Asia's Green Economy 2022 Report: Investing Behind New Realities*, Bain & Company and Temasek, with contributions from Microsoft, 7 June 2022.

13 Monika Merdekawati, Beni Suryadi, Amira Bilqis, Shahnaz Nur Firdausi, and Jeihan Kartika Hapsari, *Job Creation Towards Achieving the Regional Renewable Energy Target*, ASEAN Centre for Energy, 19 February 2022.



## Built Environment

In the ASEAN region, buildings account for 23 percent of energy use and 24 percent of carbon emissions, according to the International Energy

Agency.<sup>14</sup> Greening of this sector has high carbon-abatement potential. It also holds economic upsides for the private sector, ranging from opportunities for new green commercial and residential buildings; retrofitting existing buildings for energy efficiency; and increasing use of raw materials with low embodied carbon content, such as green cement that sequesters carbon<sup>15</sup> and efficient heating, ventilation, and air conditioning (HVAC) systems.

Currently, building to green standards entails an upfront cost premium, which can vary by building codes, local construction costs, and building type. However, lower operating costs quickly offset the added construction costs. In Singapore, for example, annual operating costs for newly constructed green buildings are an average of 16.3 percent lower over five years. And, because of a combination of benefits for occupants, including healthier, more desirable homes and workplaces, asset values rise by an average of 8.2 percent.<sup>16</sup>

As a result, built-environment opportunities have attracted the attention of corporate investors and infrastructure funds. Growing commitments from large private developers in the region promise to accelerate the greening of the industry, which is projected to produce US\$40 billion in revenue annually by 2030.<sup>17</sup> Most of that value will be generated by construction and efficient cooling, with every US\$1 million invested in energy-efficient building measures projected to generate between nine and 30 jobs.<sup>18</sup>



**Built environment represents a**

**US \$40 billion**

**annual revenue opportunity by 2030**

**Source:** Dale Hardcastle, Gerry Mattios, Emily Wu, and Frederick Teo, *Southeast Asia's Green Economy 2022 Report: Investing Behind New Realities*, Bain & Company, 7 June 2022.

14 International Energy Agency, "[ASEAN Roadmaps Towards Sustainable and Energy Efficient Buildings and Cooling in Southeast Asia](#)," 6 April 2021.

15 Sebastian Reiter, "[Transition to Net Zero: Cement](#)," *McKinsey Quarterly*, McKinsey & Company, 1 August 2022.

16 Dodge Construction Network Data & Analytics, "[World Green Building Trends 2021](#)," 2021.

17 Hardcastle et al., *Southeast Asia's Green Economy 2022*.

18 International Energy Agency, *Sustainable Recovery*, July 2020.

“Skills and training certification is key,” says Peng Er Foo, group sustainability vice president of CapitaLand Investment, a leading global real-estate investment manager. Foo emphasises that green jobs in the built-environment sector aren’t found only in construction. “While older buildings may need more manpower for

maintenance, there is demand for building managers with specialised technical skillsets for smart green buildings. What we do at [CapitaLand] is upskill our staff with these skillsets and help them to understand the impact of their role on sustainability.”

---

“Skills and training certification is key ... What we do at [CapitaLand] is upskill our staff with these skillsets and help them to understand the impact of their role on sustainability.”

PENG ER FOO, GROUP SUSTAINABILITY VICE PRESIDENT,  
CAPITALAND INVESTMENT

---





## Sustainable Farming

Agriculture is a key sector for the ASEAN economy and a major source of employment, especially for the Philippines, Indonesia, Thailand, and

Vietnam. Southeast Asia has developed into a leading exporter of palm oil, rubber, and coffee—commodities that have boosted economic development.

But development has come at a cost. The agri-food sector is the largest driver of deforestation and ecosystem degradation in the ASEAN region<sup>19</sup> and the third-largest contributor of emissions.<sup>20</sup> In addition, weather events associated with climate change are increasingly affecting this sector; from 2008 to 2018 alone, these events caused US\$21 billion in damage to crops and livestock.<sup>21</sup>

Slowing agriculture's negative environmental impacts will require Southeast Asia's large agribusinesses and estimated 100 million smallholder farmers to adopt sustainable agricultural practices that disentangle

commodity agriculture from environmental degradation.<sup>22</sup> Sustainable farming can preserve soil fertility, prevent water pollution, and protect biodiversity. Sector growth is projected to produce US\$30 billion in annual revenue by 2030.<sup>23</sup> Most of that value will come from greener fertiliser practices; high-tech agricultural innovation, such as vertical farming, automation, robotics, and modern greenhouses; and providers of modernised farm services.



**Sustainable farming represents a**

**US \$30 billion**

**annual revenue opportunity by 2030**

**Source:** Dale Hardcastle, Gerry Mattios, Emily Wu, and Frederick Teo, [Southeast Asia's Green Economy 2022 Report: Investing Behind New Realities](#), Bain & Company, 7 June 2022.

19 US Department of Agriculture's Forest Service, Spatial Informatics Group, World Agroforestry Centre, and SERVIR-Mekong, [Commodity-Driven Forest Loss: A Study of Southeast Asia](#), 5 February 2021.

20 Hardcastle et al., [Southeast Asia's Green Economy 2022](#).

21 Asian Development Bank, [Asian Development Outlook 2021: Transforming Agriculture in Asia](#), September 2021.

22 Szymon Mikolajczyk, Frieda Mikulcak, Ashley Thompson, and Imogen Long, [Unlocking Smallholder Finance for Sustainable Agriculture in Southeast Asia](#), World Wildlife Fund, 2021.

23 Hardcastle et al., [Southeast Asia's Green Economy 2022](#).



For such practices to take off, sustainability and productivity must go hand in hand. “Farmers are not agnostic to change and want to improve their farm practices,” says Cherie Tan, who heads public affairs, science, and sustainability in the Asia Pacific region for Bayer, a pharmaceutical and biotechnology company and a leading supplier of agricultural inputs (e.g. seeds and fertilisers). “We need to work to ensure that the adoption of more sustainable farm practices can also contribute to improved farmer income. The change cannot compromise on the quality of output and yields, because farmers’ livelihoods depend on it.”

Across the region, support for sustainable farming is gaining momentum. The governments of Indonesia, Malaysia, Thailand, and Vietnam have adopted policies that support sustainable farming. Investors have increasingly funded agri-tech start-ups to improve food production systems across the value chain.<sup>24</sup> A total of US\$423 million was invested in food and agriculture start-ups in 2019, a 400 percent increase since 2014.<sup>25</sup>

Overall, innovating and advancing the sector through sustainable and climate-resilient practices will aid investors and workers via improved productivity and healthier supply chains. “Sustainable, climate-smart agriculture can increase the scale and incomes of rural enterprises, including those led by smallholder farmers,” says Erin Sweeney, sustainable investment and inclusion lead at Grow Asia, a multistakeholder platform that cultivates more inclusive, resilient, and sustainable food systems in Southeast Asia. “To transition to sustainable practices, however,” she notes, “rural businesses need access to training, markets, and finance.” Those supports would help not only build green jobs in an inclusive way, but also sustain the region’s food supply amidst a changing climate.

---

“To transition to sustainable practices  
... rural businesses need access to  
training, markets, and finance.”

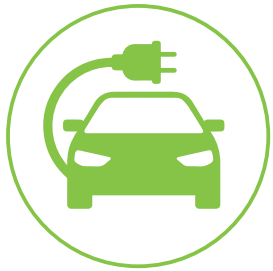
ERIN SWEENEY, SUSTAINABLE INVESTMENT AND INCLUSION LEAD,  
GROW ASIA

---

---

24 SAP Southeast Asia, “[Southeast Asia’s Sustainable Growth Hangs on Balance if Future Food Security and Food Wastage Left Unaddressed](#),” 29 November 2021.

25 AgFunder, [ASEAN 2020 AgriFoodTech Investment Report](#), 2020.



## Electric Mobility

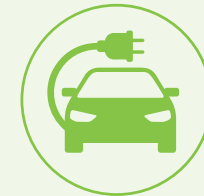
Transportation is the second-largest energy-consuming sector in the ASEAN market. Today, motorcycles and private-passenger vehicles dominate and are expected to

continue to, with projected 67 percent and 25 percent shares of the market, respectively. The total number of vehicles in the region is expected to more than double by 2040, reaching 591 million.<sup>26</sup>

While electric vehicles (EVs) represent a small portion of the transportation market today, Bain's *Green Economy 2022 Report* states that "E-mobility looks poised to take off in Indonesia, Thailand, and Vietnam, especially for two-wheel electric vehicle manufacturing and sales."<sup>27</sup> Though light rail and trains are not expected to play a substantially larger role in mobility in the region, the same report also sees a strong emerging opportunity for manufacturing of electric buses for public transportation. By 2030, vehicle electrification is projected to produce US\$50 billion in annual revenue, more than half from EV manufacturing. Indonesia, Malaysia, Singapore, and Thailand each have government-led EV roadmaps to support adoption and sector development.

For its part, Thailand is the 13th-largest automotive parts exporter and the sixth-largest commercial vehicle manufacturer in the world. With plans to use tax and tariff incentives to spur growth, it aims to become the next EV regional hub.<sup>28</sup>

The EV market already has significant consumer support. Two-thirds of Southeast Asian consumers surveyed in 2021 believe "they will inevitably adopt electrified mobility as part of their lives in the near future." Thirty-seven percent stated they would consider making an electrified vehicle their next car purchase within the next three years.<sup>29</sup>



**Electric mobility represents a**

**US \$50 billion**

**annual revenue opportunity by 2030**

**Source:** Dale Hardcastle, Gerry Mattios, Emily Wu, and Frederick Teo, *Southeast Asia's Green Economy 2022 Report: Investing Behind New Realities*, Bain & Company, 7 June 2022.

26 ASEAN Centre for Energy and Deutsche Gesellschaft für Internationale Zusammenarbeit GmbH, *The 6th ASEAN Energy Outlook*, 19 November 2020.

27 Hardcastle et al., *Southeast Asia's Green Economy 2022*.

28 Dezan Shira & Associates, "Thailand's Automotive Industry: Opportunities and Incentives," *ASEAN Briefing*, 10 May 2018.

29 WARC, "Enthusiasm for Electric Vehicles Grows in Southeast Asia," 2 May 2021.

The growth of EVs will be accompanied by a shift in skill requirements. “Unlike with combustion engine cars, servicing EVs will require more knowledge dealing with software and electronics,” says Robert Yu, former chief operating

officer of Minth Group, an auto parts manufacturer. “Car parts like tires and steering columns will stay the same, but other systems in EVs will become more advanced, like entertainment systems—even cars with massage chairs.”

---

“Unlike with combustion engine cars, servicing EVs will require more knowledge dealing with software and electronics.”

ROBERT YU, FORMER CHIEF OPERATING OFFICER, MINTH GROUP

---





## Waste Management

Rapid growth in waste driven by urbanisation and a rising consumer class will only worsen already unsustainable waste practices.

Waste management encompasses collection, transportation, processing, and recycling or disposal. Sustainable waste management aims to minimise environmental impacts and protect natural resources from waste streams. While not amongst the sectors with the highest carbon-abatement potential, waste management poses significant human health and environmental risks and is highly relevant across Southeast Asia.

The ASEAN market generated 243 million tonnes of waste in 2016 alone. More than half of that waste (53 percent) remained uncollected, much of it illegally dumped. Less than 25 percent was recycled.<sup>30</sup>

All six ASEAN nations have taken steps to manage and reduce solid waste. For example, several Southeast Asian countries have begun to develop national strategies for “circular economies”—that is, eliminating waste by keeping products and materials in continuous use by

repairing, remanufacturing, or recycling them at their highest value. In Southeast Asia, circular-economy green growth opportunities could create 6.6 million jobs by 2030, but would require US\$54 billion in annual capital investments, estimates the Asian Development Bank.<sup>31</sup> Much of that economic activity will be generated by private-sector players who are largely enabled or regulated by ASEAN governments.



**Municipal solid waste management represents a**

**US \$10 billion cost by 2030**

**Source:** Bridgespan Group analysis

<sup>30</sup> ASEAN Secretariat, *ASEAN Regional Action Plan for Combating Marine Debris in the ASEAN Member States (2021–2025): Action Plan Summary*, May 2021.

<sup>31</sup> Asian Development Bank, *Green Recovery*.





SECTION 3

# Green Jobs with Highest Employment Potential






# Green Jobs with Highest Employment Potential

Within our five priority sectors, we identified the occupations that offer the most potential for entry-level employment, a proxy for accessibility and a starting place for workers with newly acquired green skills. Because country-level information on jobs by sector and skill requirement is of variable quality, we interviewed industry

experts, employers, and work-training organisations to identify entry-level green jobs with high employment potential.

That effort yielded more than 30 such jobs (see Figure 4). Amongst them are both new types of green jobs, such as

**Figure 4: Thirty-Four Entry-Level Jobs with Significant Employment Potential**

 <b>Solar</b>	 <b>Built Environment</b>	 <b>Sustainable Farming</b>	 <b>Electric Mobility</b>	 <b>Waste Management</b>
Factory workers and technicians Facilities managers Installation workers or solar technologists Electrical technicians Monitoring personnel Maintenance personnel Solar operators	Sustainability consultants Electrical technicians Mechanical technicians Construction labourers Facilities managers Maintenance technicians Building planning officers Building project officers Software developers Sales or leasing representatives	Sales representatives Machine operators Crop protection applicators Agricultural workers, farmers, or breeders Factory workers Maintenance technicians	Technicians Plant floor or assembly workers Sales representatives Infrastructure installers Software developers Electric vehicle technicians and after-sales service technicians	Waste pickers Waste collection drivers Waste and recycling sorters Machine operators Maintenance technicians

Source: The Bridgespan Group

solar panel installation, and existing jobs that over time will require new green skills, such as electricians learning to install modern HVAC systems. Indeed, most jobs fall in the latter category. “Today, you don’t typically have a separate ‘green job,’” says the cofounder of a Singapore-based company providing clean tech for smart buildings. “Many jobs are starting to have more green aspects to them. You need to think about everything—reducing cement, reducing wire waste. The job will still be done by the same person, but the way of doing it is different.”

We assessed each job using three criteria: accessibility based on required skills and credentials, career-progression prospects, and health and safety risks. That assessment revealed two distinct categories of green employment: positions with, and those without, significant on-the-job health and safety concerns. Policies and programmes to assist the two groups differ sharply.

Most of the jobs on our list involve tasks that do not jeopardise the health or safety of workers and are relatively

accessible, requiring only a secondary education or additional vocational certification, with some skills training targeted to locally available employment opportunities. Many entry-level jobs also provide some career-advancement opportunities facilitated by on-the-job training.

By contrast, other green jobs present health and safety risks, especially in construction, waste management, and agriculture. These include farm and construction labour and waste picking and sorting. Many such jobs pay less than a living wage and attract a high percentage of informal and foreign workers, which makes regulation more challenging.<sup>32</sup> “These jobs are known as the 3Ds in agriculture: dirty, demeaning, and dangerous,” says a former chief sustainability officer of a large agribusiness in the ASEAN region. “The number of accidents is higher than what you would find in a factory.” More than training, workers in these jobs need improvements in working conditions, such as higher pay, safety on the job, and benefits.

---

32 International Labour Organization Department of Statistics, “[Statistics on the Informal Economy](#).”





SECTION 4

# Overcoming Barriers to Green Jobs



# Overcoming Barriers to Green Jobs

---

Government policies and private financing are the twin turbines that will power green job creation. Recent reports from the ILO and from Bain & Company surveying ASEAN green growth policies and investment trends recommended numerous steps to accelerate both.<sup>33</sup> This report builds on this work and looks at how to ensure that growing demand for green jobs is matched by suitable workforce training, particularly for underserved workers. (See “[Generation: Market-Driven Employment Support for Underserved Students](#).”) To date, such efforts remain scattered and small scale.

Our research suggests current policy and programme efforts to provide high-quality workforce training and to mitigate job-quality issues for underserved workers should broadly focus on:

- **Coordinating green job and skills data and definitions.** Data sharing using common definitions of green jobs and skills would enable leaders to focus on “hot spots” that would make the biggest difference on local and national levels. That would require coordination from governments, information from employers, and support from NGOs and investors.
- **Improving accessibility.** Bridging employment demand-supply gaps begins with expanding green-skills-focused training and job-readiness support programmes.

Settings for workforce development and training include public schools, technical schools, and NGO-sponsored programmes. Improving accessibility also includes connecting green job vacancies with potential employees, developing equitable hiring processes, and helping individuals acquire skills to aid job placement, with specific on-ramps for underserved communities to enter the green economy. Indeed, employers may need to review hiring and training policies to expand access to underserved individuals.

- **Improving job quality with economic benefits.** Living wages offered by employers are an important part of a just transition. So, too, are safe working conditions with social protection benefits such as medical insurance and unemployment protection.

Different stakeholders play different roles in addressing these barriers. The following sections expand on the recommendations briefly summarised in [Figure 5](#) regarding where governments, funders, NGOs, employers, and investors can make a difference. We also provide examples throughout that illustrate how some work is underway—and that others can learn from and coordinate with. While there are emerging green shoots, more needs to be done at scale to make an impact. Our findings are a representative overview rather than an exhaustive accounting.

---

<sup>33</sup> Association of Southeast Asian Nations and International Labour Organization, [Green Jobs Policy Readiness](#); Hardcastle et al., [Southeast Asia's Green Economy 2022](#).

**Figure 5: Overcoming Barriers to Green Jobs for Underserved Individuals**

What governments, funders, NGOs, employers, and investors can do

✔ Potential to lead    ✔ Potential to support

Barriers		Who could lead this?			
		Government	Funders & NGOs	Employers	Investors
1. Identify green jobs	<b>Identify green jobs and skills in demand today:</b> Create clear definitions and gather data on green jobs available today, their unique skills required, and attractiveness (economic and decency) to focus efforts on “hot spots” (national and local level); coordinate to ensure knowledge sharing.	✔	✔	✔	
	<b>Identify green jobs and skills in demand in the future:</b> Develop projections of which green jobs will be in high demand in the next 5-10 years, as well as the unique skills they require.	✔	✔	✔	
2. Improve accessibility	<b>Improve supply-demand matching of green jobs:</b> Help connect green job vacancies with potential employees, bridging information gaps and other barriers.	✔	✔	✔	
	<b>Equip underserved individuals with green skills:</b> Support, fund, or create programmes helping individuals acquire skills to access these jobs, as well as industry-recognised certification for their qualifications.	✔	✔	✔	
	<b>Supplement technical skills with soft skills, job-readiness training, and other holistic support:</b> Help individuals develop confidence and soft skills that will aid their job placement and advancement.		✔	✔	
	<b>Support underserved individuals to secure these jobs:</b> Help individuals throughout the recruiting process, starting from job hunting, especially for individuals entering formal employment for the first time.		✔	✔	
	<b>Develop equitable processes for hiring, development, and retention:</b> Incentivise and ensure that HR processes are equitable and actively promote advancement of employees from underserved backgrounds.	✔	✔	✔	✔
3. Improve job quality	<b>Improve economic benefits of green jobs:</b> Ensure green jobs pay a living wage and provide secure, stable employment.	✔	✔	✔	✔
	<b>Improve protections for and working conditions of green jobs:</b> Improve green jobs’ quality, including health and safety conditions and social protection (e.g. medical and unemployment protection).	✔	✔	✔	✔

Source: The Bridgespan Group

## Governments

ASEAN governments play a lead role in promoting quality employment opportunities that advance sustainable economic development. Many policy fields are involved, including development and employment policy, energy policy, industry policy, and training and skills development.

To assess the overall policy readiness of the region, the Malaysia Ministry of Human Resources led a 2021 study in collaboration with the ASEAN Secretariat and the ILO.<sup>34</sup> The summary in Table 1 below builds on key recommendations from that report, along with ideas and examples drawn from our research and interviews.

**Table 1. Promoting Quality Employment: What Governments Can Do**

Recommendations	Details	Examples
<p><b>Coordinate green job and skills data and definitions</b></p>	<p><b>Conduct research on green jobs and skills requirements</b> within each country to assess sector growth potential alongside employment and skills needs. It's important to disseminate this research amongst key stakeholders, especially industry associations and job-training organisations, so the data is used by practitioners in the field.</p> <p><b>Adopt a nationally and regionally consistent definition of green jobs.</b> A shared definition of green jobs will facilitate sharing of analyses and evidence for policy making.</p>	<p>Several ASEAN member states have a definition of green jobs, including <b>Malaysia, the Philippines, and Vietnam.</b></p> <p>In partnership with the <b>ILO, Malaysia</b> and <b>the Philippines</b> have published green-jobs mapping studies which include key sectoral trends, estimated employment, and an assessment of the decency of green employment.</p> <p>In the Philippines, the <b>Green Jobs Act</b> supports the development of a database on green jobs, skills, and businesses creating green jobs.</p> <p>Examples of green-jobs research can be found globally. For example, the US-based Interstate Renewable Energy Council conducts an annual <b>National Solar Jobs Census</b> detailing jobs by state as well as the potential for career advancement.</p> <p style="text-align: right;">→</p>

34 Association of Southeast Asian Nations and International Labour Organization, *Green Jobs Policy Readiness*.

Recommendations	Details	Examples
<p><b>Improve accessibility</b> by incentivising or funding high-quality job-training programmes</p>	<p><b>Provide multiyear funding to workforce training providers</b> to develop green-job training programmes. Organisations need <a href="#">multiyear, unrestricted funding</a> to build organisational capacity and facilitate continuity in programming. Providing unrestricted funding can also enable organisations to pursue critical supplementary supports, including mentorship after job placement.</p> <p><b>Governments can provide financing or incentives to employers</b> for training and hiring and encourage companies to prioritise green-job workforce development by offering tax credits to companies willing to spend on skills development, or to companies that hire individuals from underserved communities.</p> <p><b>Improve public workforce development programmes:</b></p> <ul style="list-style-type: none"> <li>• Update public vocational-training programmes to account for green skills.</li> <li>• Ensure vocational-training programmes are designed to support individuals from underserved communities by, for instance, providing safe dormitories, gender-inclusive restrooms, and disability-inclusive facilities.</li> </ul> <p><b>Develop certifications frameworks for green skills.</b> A recognised certification not only serves as a signal to employers, it also promotes higher training standards and job transferability. It is ideal for certifications to be recognised at the regional level to promote benefits (e.g. job transferability) across countries.</p>	<p><b>Malaysia’s Human Resources Development Fund</b> distributed nearly US\$160 million in grants, with roughly 36 percent of the approved courses being related to technical and vocational education and training (TVET).</p> <p><b>The Philippines</b> has incentives for individuals and businesses, including a tax deduction for expenses incurred on skills training and R&amp;D for green jobs, and an exemption from customs duties and taxes for the import of capital equipment used directly in the promotion, generation, and maintenance of green jobs.</p> <p><b>Cambodia, Indonesia, the Philippines, and Singapore</b> have undertaken initiatives to update TVET systems. For example:</p> <ul style="list-style-type: none"> <li>• The Philippines has a <a href="#">National Green Jobs Human Resource Development Plan</a> that aims to provide green skills, including through TVET systems.</li> <li>• Singapore has developed a <a href="#">Skills Framework for Environmental Services</a> through SkillsFuture which promotes skills mastery and lifelong learning for the environmental services workforce.</li> </ul> <p>In the Philippines, the <a href="#">Technical Education and Skills Development Authority</a> is developing a qualifications framework for the green economy.</p>



Recommendations	Details	Examples
<p><b>Improve job quality with economic benefits</b></p>	<p><b>Institute policies to advance economic inclusion.</b> As part of broader policy packages to advance economic inclusion, policies can create living wages for green jobs, which should enable workers to afford basic necessities <a href="#">and pave a pathway out of poverty</a>. For example, governments can implement an earned-income tax credit or cash transfers to provide income support and incentivise labour supply.</p> <p><b>Assess and manage occupational health and safety risks in relevant sectors.</b> Develop interventions, such as health and safety regulations, and sector-specific training to minimise the occupational health and safety risks of green jobs.</p>	<p>The United States Department of Energy has a <a href="#">Green Jobs Tax Credit</a>—qualified employers are eligible for a US\$500 tax credit for each new green job created that offers a salary of at least US\$50,000.</p> <p><a href="#">Singapore, Thailand, and Vietnam</a> have significant policy elements in place to ensure social protections. For example, Thailand includes medical care, illness, maternity, old-age, work injury, unemployment, and multiple other benefits. All other ASEAN countries have some similar policy elements in place.</p>

## Funders and NGOs

---

Funders and NGOs can support governments in developing and scaling technical and vocational education and training (TVET) programmes that prepare underserved individuals for green jobs. Here, we use “funders” as a catch-all to include multilateral and bilateral institutions (e.g. Asian Development Bank), foundations, and philanthropists. These programmes are more accessible than university training and well positioned to provide practical skills.

Across ASEAN nations, however, TVET programmes do not yet meet the requirements of the changing world of work. This is especially true for emerging green jobs that, to date, lack requisite training modules. “This is caused by a lack of business-sector involvement in TVET, outdated training programmes, and insufficient competencies of teaching and training personnel,” concludes the Agency for International Cooperation (GIZ), a German development aid agency, about its experience in Vietnam. “As a result, vocational training has a negative image and low enrolment.”<sup>35</sup>

In Vietnam, GIZ has worked to advance green- and digital-skills training in a variety of ways, including supporting 11 high-quality TVET institutions to provide modern training programmes; promoting cooperation with the business

sector to develop and update demand-oriented standards and conduct cooperative training programmes; and enhancing the image of TVET and participation in training programmes by organising inclusion days at TVET institutes and providing scholarships. (See “[An Giang Vocational College: Vocational Training for Women and People with Disabilities](#).”)

The Philippines-based Asia Society for Social Improvement and Sustainable Transformation (ASSIST) provides vocational education across a range of industries in the Philippines and Vietnam, including green-skills training. For example, its Green Electrician lab in Vietnam trains not only students but also instructors, who then continue and expand the programme. Another programme in the Philippines trains solar technicians for employment in local communities (see “[ASSIST: NGO Collaborates with Employers to Design Green-Skills Training](#)”).

In [Table 2](#), we summarise a variety of ways in which NGOs and funders can contribute to advancing green jobs in the ASEAN region and ensure green jobs are accessible to underserved communities. Many of these actions can and should be undertaken in collaboration with other key stakeholders, such as governments and employers.

---

<sup>35</sup> Akzente: *The GIZ Magazine*, “[Viet Nam Is at a Crossroads](#),” July 2020.

**Table 2. Promoting Quality Employment: What Funders and NGOs Can Do**

Recommendations	Details	Examples
<p><b>Coordinate green job and skills data and definitions</b></p>	<p><b>Conduct <a href="#">research and mapping studies</a></b> on green jobs. Include research on the <a href="#">potential growth</a> for the sector and for employment to enable employers and NGOs to adjust training to meet needs. Highlight specific jobs, hotspots, and green skills needed.</p> <p>Support government organisations, other multilaterals, and NGOs in the adoption of a <b><a href="#">consistent definition of green jobs</a></b>.</p>	<p>The ILO has published extensive green-jobs <b>mapping studies</b> for <a href="#">Malaysia</a> and <a href="#">the Philippines</a>, which include key sectoral trends, estimated employment, and an assessment of job quality.</p>
<p><b>Improve accessibility</b> by incentivising or funding high-quality job-training programmes</p>	<p><b>Identify specific green jobs</b> and highlight those that have sufficient demand in the medium-to-long term and provide quality employment. Document which employers have green jobs, headcount needed, and job locations.</p> <p><b>Research employers</b> to determine whether they are willing to support training programmes.</p> <p><b>Build relationships</b> with employers to facilitate job opportunities for underserved communities.</p> <p><b>Build <a href="#">awareness of green jobs</a></b> and their benefits, especially with underserved individuals and communities who often lack the social or financial capital to seek out these opportunities. Many traditional jobs, such as auto mechanics or electricians, require new skills to enter the green economy. NGOs can help build those new skills by using new green modules on top of traditional training.</p> <p><b>Market available green job positions</b>, providing information and consultation about career pathways and benefits.</p>	<p><b><a href="#">SOLS 24/7</a></b> provides in-person and online education to help underserved communities break the cycle of poverty and move towards middle-class society. The organisation offers vocational training—including English instruction, digital skills, and a solar academy—and social empowerment programmes across the ASEAN region, with a strong focus in Malaysia and Indonesia.</p>



Recommendations	Details	Examples
<p><b>Equip underserved individuals with green skills</b> by designing workforce training programmes in collaboration with employers</p>	<p><b>Co-develop curriculum with trade partners and employers</b> to ensure training will lead to skills required for employment.</p> <p><b>Engage employers</b> to develop training programmes that meet workplace needs. Their input can also be leveraged for training support, job placement facilitation, and funding.</p> <p><b>Engage multiple employers and industry partners</b> to ensure skills are relevant and in demand. Government and NGO data on green jobs and skills demand can also be leveraged where possible.</p> <p><b>Match supply of trained workers with employer demand</b>, specifying the number of people needed for each job to prevent oversupply.</p> <p>NGOs must <b>make the business case to employers</b> to engage with green training design, highlighting benefits such as improved productivity, reduced attrition, and more.</p> <p><b>Regularly review training programmes</b> to ensure that the skills provided remain relevant to the job market and that teaching methods are effective.</p>	<p><b>Generation</b>, which prepares and places students in 17 countries, works closely with employers to create training programmes for professions across five sectors, including tech, healthcare, customer service and sales, skilled trades, and green jobs.</p> <p><b>An Giang Vocational College in Vietnam</b> conducts annual surveys to gauge employer demand for specific skills and tracks graduates for up to two years to determine effectiveness of training programmes.</p>





Recommendations	Details	Examples
<p><b>Supplement technical skills with soft skills and job readiness training</b> by providing holistic support for underserved individuals</p>	<p>Ensure programme design addresses <b>typical barriers</b> faced by learners from underserved backgrounds, including the following:</p> <ul style="list-style-type: none"> <li>• <b>Financial.</b> <a href="#">Provide basic support</a>, such as supplies—laptops, books, etc.—required for learning. Some NGOs provide a living allowance or scholarships during training to compensate for the opportunity cost of forgone income.</li> <li>• <b>Logistics.</b> Providing basic logistics can include inclusive restrooms, safe transportation to and from job sites, housing accommodations, and appropriate attire for job interviews and employment.</li> <li>• <b>Soft skills.</b> Many underserved individuals may not be aware of formal employment norms and expectations and can benefit from coaching.</li> <li>• <b>Inclusivity.</b> Create a safe, inclusive environment that enables new hires to feel welcomed. Tailor programme to address specific groups. For example, for women, provide childcare support, anti-harassment trainings for workers and employers, inclusive communication trainings for staff, gender-specific and inclusive facilities, confidence building, gender-specific mentoring, and gender-specific scholarships.</li> </ul>	<p><b>PNV</b> provides IT trainings in Vietnam to low-income youths in rural areas and relocation expenses to students moving for jobs in urban areas.</p> <p><b>Prestasi Junior in Indonesia</b> strives for equitable recruitment of women to digital training programmes where male students typically dominate. Prestasi Junior actively engages families in conversations about how girls can take the programme and excel.</p> <p><b>BRAC</b>, a global NGO, utilizes the <a href="#">“peer leader” system</a> to provide soft skills training to apprentices in Bangladesh. Over 200 peer leaders are trained on topics that promote professional development and gender inclusion (e.g. financial literacy, reproductive health, self-protection, and family planning).</p>



Recommendations	Details	Examples
<p><b>Support underserved individuals</b> to secure green jobs with training and networking opportunities</p>	<p>Help individuals throughout the recruiting process, starting with training on resume writing and job interviews, when relevant. Assist with setting up interviews with industry partners, during which employers can connect with candidates and assess their skills.</p>	<p><b>Generation</b> works closely with employers to implement skill and organisational-fit assessments of candidates. In-person events are held to help employers establish a “whole person” impression of applicants, which can reduce implicit hiring biases.</p>
<p><b>Improve economic benefits</b> for green jobs via employer and civil advocacy</p>	<p><b>Work with employers</b> to provide input in designing and offering fair compensation and employment packages.</p>	<p>The ILO’s <b>Minimum Wage Policy Guide</b> recommends that in countries where there are statutory minimum wages, NGOs can play a role in promoting social dialogue that contributes to policy design and increased buy-in.</p>
<p><b>Improve working conditions</b> for green jobs via employer and policy advocacy</p>	<p><b>Work with employers</b> to improve health and safety standards in the workplace.</p> <p><b>Advocate for policies</b> that promote social protection regarding health and safety standards in the workplace.</p>	<p><b>BRAC</b> selects and guides local employers on the basics of workplace safety, such as ensuring adequate working space, hygienic toilets, personal protective equipment, fire extinguishers, and first-aid kits are available at job sites.</p> <p><b>ASSIST</b>’s Promote Technical Education Reform of Mechanics to Professional Technicians (<b>PROMPT</b>) programme promotes safety and quality testing in elevator/escalator servicing.</p>

## Employers

As the green economy grows, companies have many reasons to promote inclusion for underserved workers. For one thing, they can access an untapped pool of talent. Most green jobs require only a secondary school diploma or vocational or technical training. That means employers can cast a wide net to find workers from all backgrounds, including those from underserved communities. Studies also show that diversity and inclusion are associated with “greater innovation, productivity and performance, talent recruitment and retention, and workforce well-being.”<sup>36</sup>

Businesses can take advantage of those benefits while also ensuring underserved individuals and communities are not left behind. Employers are uniquely positioned to support

underserved communities in accessing green jobs by collaborating with other stakeholders to share and aggregate information about green jobs and skills. They can also support workforce training organisations by providing design input, training assistance, work-based learning opportunities, and funding.

While many consider “green” and “good” to be synonymous, jobs in green sectors are not quality jobs by default. It takes a concerted effort on the part of public, private, and social sectors to ensure workers have a living wage, safe working conditions, and adequate benefits. Table 3 summarises ways in which employers can contribute to advancing quality green jobs.

**Table 3. Promoting Quality Employment: What Employers Can Do**

Recommendations	Details	Examples
Coordinate green job and skills data and definitions	<p><b>Collaborate with other employers and industry organisations</b> to aggregate information about green jobs, such as job descriptions, career pathways, and demand forecasts.</p> <p><b>Share information</b> with governments and workforce organisations, and actively coordinate with other stakeholders to ensure accessibility of data.</p>	<p>The <b>Green Jobs Initiative</b> promotes opportunity, equity, and a just transition towards a green economy. It is a partnership involving the International Organisation of Employers, the United Nations Environment Programme, the International Trade Union Confederation, and the ILO.</p>



36 International Labour Organization, “[Greater Progress on Diversity and Inclusion Essential to Rebuild Productive and Resilient Workplaces](#),” 6 April 2022.

Recommendations	Details	Examples
<p><b>Improve accessibility</b> by incentivising or funding high-quality job-training programmes</p>	<p><b>Collaborate with governments and workforce training organisations</b> to <a href="#">match labour supply with job vacancies</a>.</p> <p><b>Participate in forums, job fairs, and other public events</b> to promote green-job openings.</p> <p><b>Provide information</b> about specific skills required for different types of green jobs.</p>	<p><b><a href="#">Brunei's Energy Industry Competency Framework</a></b> defines competencies for jobs in the energy sector, creates alignment between training providers and industry requirements, and increases employability of workers in the sector through upskilling. The framework also contributes to activities such as sponsored job fairs and career roadshows to support green jobs.</p>
<p><b>Equip workers with green skills</b> by creating or supporting training programmes</p>	<p><b>Develop in-house training programmes</b> so that current and incoming employees have the green skills they'll need for the organisation's future.</p> <p><b>Collaborate with workforce training organisations</b> by providing input for curriculum design and estimates of headcount needed for each role to help match demand and supply.</p> <p><b>Training:</b> Employers can support workforce training providers by training the trainers and participating in workshops and other in-person events.</p> <p><b><a href="#">Work-based learning opportunities:</a></b> Internships and apprenticeships are essential for technical education. By supporting them, employers can benefit from the reduced time and costs of recruiting and post-recruitment training.</p> <p><b>Funding:</b> Employers can provide multiyear funding for training programmes, basing funding incentives on job placements created by the programme.</p>	<p><b><a href="#">Schneider Electric</a></b> has partnered with ASSIST to create the <a href="#">Green Electrician lab</a> in Vietnam, which provides training on electricity, sustainable energy management, and entrepreneurship in a programme leading to stable green employment.</p>



Recommendations	Details	Examples
<p><b>Implement equitable processes for hiring, development, and retention</b> that actively promote advancement of employees from underserved backgrounds</p>	<p><b>Ensure equitable hiring processes</b> by <a href="#">reducing costs of application</a> for candidates from historically underserved communities (e.g. giving vouchers to attend job fairs or subsidising transportation to job interviews).</p> <p><b>Adjust assessment methods</b> to focus on skills and potential over education or credentials. For example, consider using sample work sessions instead of traditional interviews, as many underserved applicants are unlikely to have extensive experience in the field.</p> <p><b>Support career advancement</b> of underserved individuals by providing effective onboarding, training, and mentorship opportunities. For instance, provide training on norms and expectations, such as arriving to work on time and time and shift management.</p>	<p>Employers working with the <a href="#">Nomi Network</a> receive onboarding with specialists to understand challenges faced by women who are survivors of or at risk of human trafficking.</p>
<p><b>Improve job quality with economic benefits</b></p>	<p><b>Offer full-time employment</b> instead of short-term contracts where possible, as well as <b>fair wages</b> with stable, predictable payments. Studies have shown that responsible labour practices result in <a href="#">positive business outcomes</a>.</p> <p><b>Support career advancement</b> by providing on-the-job training to help employees acquire the skills needed to qualify for a promotion.</p>	<p><a href="#">Research by the ILO</a> has found that minimum-wage and working-time standards can translate into greater satisfaction and improved performance for workers as well as reduce turnover.</p>



Recommendations	Details	Examples
<p><b>Improve working conditions</b> for green jobs, including safety and health protection, social protection, and labour rights</p>	<p><b>Ensuring <a href="#">responsible labour practices</a></b> can also help to attract foreign investment. Safety standards can reduce costly accidents.</p> <p><a href="#">Use practices</a> such as:</p> <ul style="list-style-type: none"> <li>• <b>Conducting risk assessments</b> and hazard identification</li> <li>• <b>Creating and communicating explicit occupational safety and health (OSH) policies</b>, ensuring worker participation in creation and training</li> <li>• <b>Allocating responsibility and accountability</b> for OSH management to members of management</li> <li>• <b>Implementing documentation and record-keeping systems</b> for OSH risks</li> <li>• <b>Conducting periodic audits</b> to ensure OSH management systems are being implemented</li> <li>• <b>Regularly reviewing and updating</b> OSH management systems for continual improvement</li> <li>• <b>Provide benefits</b>, such as healthcare and pensions, that contribute to improving long-term quality of life for employees</li> </ul>	<p>The <a href="#">Philippine Contractor Association</a>, which has over 1,500 members, creates guidelines for worker safety (e.g. COVID-19 protocols for construction sites).</p>

## Investors

Many investors are prioritising environmental, social, and governance (ESG) goals in their investment strategies and reaping the benefits from better portfolio performance.<sup>37</sup> Indeed, multiple studies have shown positive correlations between how companies treat workers and their financial performance.<sup>38</sup> As investors adopt socially responsible

investing principles, they also advance green workforce development across the industries they invest in.

Our research pointed to a variety of ways investors can hold portfolio companies to higher diversity and inclusion standards while supporting decent pay and working conditions. Table 4 summarises these findings.

**Table 4. Promoting Quality Employment: What Investors Can Do**

Recommendations	Details	Examples
<p><b>Improve accessibility</b> by incentivising or funding high-quality job-training programmes</p>	<p><b>Integrate diversity, equity, and inclusion (DEI)</b> performance into investment analysis and decision making. Studies show that increased diversity and human capital policies have a <a href="#">clear relationship with business outcomes</a>. (While disclosure of workforce diversity data is not yet common amongst companies, investors can lead the charge by asking for transparency on DEI performance.)</p> <p><b>Support portfolio companies</b> in adopting equitable talent management processes as part of professionalisation.</p> <p>Find opportunities to engage and encourage <a href="#">equitable recruiting, retention, and promotion</a> (e.g. by taking a skill-based approach in HR processes).</p>	<p><b>Bursa Malaysia</b>, the stock exchange of Malaysia, has enhanced listing requirements for issuers with a market cap of RM2 billion (about US\$450 million) to appoint at least one female director on the board.</p>



37 Witold Henisz, Tim Koller, and Robin Nuttall, “[Five Ways that ESG Creates Value](#),” *McKinsey Quarterly*, November 2019; Matthew Bell, “[Why ESG Performance Is Growing in Importance for Investors](#),” EY, 9 March 2021.

38 Aaron Bernstein and Larry Beeferman, “[The Materiality of Human Capital to Corporate Financial Performance](#),” IRRC Institute, April 2015.

Recommendations	Details	Examples
<p><b>Improve job quality with economic benefits</b></p>	<p><b>Integrate <a href="#">ESG performance</a></b> into investment analysis and decision making, including those regarding <a href="#">labour rights</a>.</p> <p><b>Conduct thorough assessments</b> of ESG policies, processes, and outcomes.</p> <p><b>Share best practices: join <a href="#">alliances with like-minded institutional investors</a></b> to promote investor responsibility and standard setting in advancing labour rights and green growth.</p> <p><b>Support portfolio companies</b> in adopting responsible practices and mitigating adverse impacts.</p>	<p>The <a href="#">Platform Living Wage Financials (PLWF)</a> is an alliance of 19 financial institutions that support portfolio companies to enable living wages in global supply chains. PLWF collaborates with external experts and works with companies to advance a living-wage agenda.</p> <p><a href="#">Aviva Investors</a> launched its proprietary Sustainable Transition Loans Framework and pledged to originate £1 billion (about US\$1.2 billion) in loans for sustainable real estate.</p>







SECTION 5

# The Green Road Ahead

# The Green Road Ahead

---

A green economy is growing across Southeast Asia. In many ways, the transition is a win-win opportunity: it not only represents a significant economic opportunity, but also will improve energy security, resilience to extreme weather events, and health outcomes.

With the right policies and financing, the green economy also stands to create new employment opportunities for millions of workers. Indeed, to achieve their net-zero carbon-emissions pledges, ASEAN nations will need workforces with the green skills to fill the green jobs that will flourish in a green economy. The shining opportunity ahead is to develop those workforces by ensuring green jobs are accessible to historically underserved individuals and communities. It's a chance to live into the post-COVID

mantra of “build back better”—that is, for government, business, investors, and the social sector to invest in making their economies more equitable and sustainable than ever.

Our research points to public and private efforts that could promote green jobs while making them accessible to the historically underserved. We hope it will inspire others to build on this foundation. Beyond the examples, we also hope this report serves as a wake-up call for all stakeholders to actively pursue policies and programmes that advance the promise of green jobs while helping underserved individuals take advantage of the coming green economy. There's plenty of work ahead—and no time to waste to redouble efforts to build a green economy that works for all.

---

**Chris Addy** is a partner at *The Bridgespan Group* in Singapore, where **Xueling Lee** is a principal and **Rose Farah** a senior associate consultant. **Roger Thompson** is an editorial director in *Bridgespan's* Boston office. The authors are grateful for the indispensable help of **Patranid Treepongkaruna** and **Rui-Lin Ler**, associate consultants, in *Bain & Company's* Southeast Asia office, as well as **Rachel Fong**, an extern from *ABC Impact*.





SECTION 6

# Organisation Profiles

# Organisation Profiles

---

## Generation: Market-Driven Employment Support for Underserved Students

---

**Generation** is a US-based NGO that provides end-to-end training and support for unemployed and underemployed young people and mid-career individuals from non-traditional backgrounds across 17 countries. In Singapore and Thailand, Generation funds programmes that span technology, healthcare, customer service and sales, skilled trades, and green jobs. It places upwards of 90 percent of its graduates in jobs.

**Employer engagement.** Generation integrates employer engagement throughout its workforce training processes, starting from job selection and programme design to evaluation at the end of programmes. Employer engagement is a key factor in developing successful employment programmes for two reasons:

- **Ensuring programme relevance.** Industry input from multiple employers is required to ensure the curriculum is effectively responsive to market needs. One of the ways Generation establishes connections with employers is by working with large employers (e.g. Microsoft) or “aggregators” that have their own network of other employers seeking employees with given skills.
- **Increasing job placement.** For certain jobs, training alone is not enough to support candidates from non-traditional backgrounds, because many traditional

recruiting processes focus on qualifications and past experience. Generation engages senior management and human resources teams in modifying recruitment processes to focus on growth potential, transferrable skills, and organisational fit over prior experience. This is a crucial step that can be time-consuming, especially with larger employers. Graduates are also connected to interviews with employers for immediate job placement after completing a programme and then supported for up to six months with coaching and mentorship once they are in a new role.

**Value for employers.** It’s essential to make the business case for employers to invest in and commit to a training programme. For example, Generation conducts job-activity mapping exercises with employers by observing high performers and designing curricula to model their behaviours. →

**Evaluation.** Where possible, Generation tries to quantify the return on investment and cost-per-hire for employers, making the business case for working with their organisation by rigorously measuring data over the long term.

**Impact**

- Over 1,000 graduates in Singapore (94 percent graduation rate; 85 percent job attainment within 180 days).
- Over 200 graduates in Thailand in its first year of operation.



Generation Thailand graduates receive their graduation certificates from the Generation Thailand CEO. (Photo: Generation Thailand)

## An Giang Vocational College: Vocational Training for Women and People with Disabilities

**An Giang Vocational College** in Vietnam works in collaboration with GIZ, a German development aid agency, to support students from historically underserved backgrounds in vocational training and employment (e.g. jobs and skills in mechatronics, electronics, refrigeration, and welding.)

**Promoting occupational inclusivity.** Many women and people with disabilities hesitate to consider technical job training. Average female participation in technical occupations is less than 5 percent due to perceptions (amongst both potential learners and employers) that technical jobs are not suitable for women. Some technical and vocational education and training (TVET) institutions do not maintain or make available female toilets, safe dormitories for female students, or facilities accessible for people with disabilities.

An Giang Vocational College organises information events (called “open days”) specifically for women and people with disabilities and uses hands-on workshops and talks from industry partners to build confidence and familiarity with technical jobs. It also supplements its technical skills education with holistic support to help students from historically underserved backgrounds, such as women and people with disabilities, participate.

**Creating an inclusive learning environment.** In collaboration with GIZ, instructors receive training

on inclusive communication, inclusive career planning, and anti-harassment.

**Financial support.** Scholarships for women and people with disabilities are given out under GIZ sponsorship.

**Working with employers.** The college advocates for the employment of women and people with disabilities with industry partners and employers.

**Spreading the word.** The college uses social media and marketing efforts to promote ongoing initiatives and attract students.

### Impact

- An Giang has one of the highest participation rates for women (20 percent of total students) and people with disabilities (3 percent of total students) amongst TVET institutions in Vietnam.
- The college helps roughly 80 percent of graduates find jobs.

## ASSIST: NGO Collaborates with Employers to Design Green-Skills Training

The **Asia Society for Social Improvement and Sustainable Transformation (ASSIST)**, a Philippines-based NGO operating in four countries, works on social, economic, and environmental challenges to sustainability. It supports vocational education and labour-market development across a range of industries, such as renewable energy and sustainable infrastructure. Programmes in the Philippines and Vietnam serve low-income individuals from underserved communities, 70 percent urban and 30 percent rural. ASSIST is one of the few organisations in Southeast Asia working to equip workers with green skills.

**Modular training programmes.** When collaborating with technical and vocational education and training (TVET) programmes, ASSIST uses the technical training provided by these programmes as the “base” curriculum, then adds modules, such as specific green skills, job readiness, and digital skills. For example, its Green Electrician lab in Vietnam makes use of the traditional technician training that ASSIST’s TVET partner already offers, then adds instruction in topics such as sustainable energy management and solar photovoltaic power. This leads to easier programme adoption for several reasons:

- New content is added quickly to respond to market demand.
- A modular curriculum gives students flexibility to work as traditional technicians as well as the “greener” variations as demand arises.

- Partners and funders are equipped to pick and choose the skill modules most relevant to them.

**Experience-based learning.** Hands-on learning is key for technical education. ASSIST leverages its partnerships with Schneider Electric and the Agency for International Cooperation (GIZ), a German development aid agency, to provide up-to-date technology and on-the-job training.

**Certification.** ASSIST is working with globally recognised organisations to create certifications for programme graduates, such as construction-site safety certification for its Future Movers programme. Certification can help to facilitate increased transferability of skills for students.



## Impact

- The **Green Electrician lab in Vietnam** trains youth from underserved backgrounds to access stable employment in green fields in collaboration with Schneider Electric. Since its inception, the programme has seen:
  - More than 240 students qualified as basic electricians.
  - Over 100 students qualified as sustainable energy managers.
  - 15 trainers certified.
  - One TVET partner (Ly Tu Trong College) continue running the course independently of ASSIST.
- The **accessRE programme in the Philippines** trains solar technicians for local communities in collaboration with SolarNRG. Since inception, it has trained and certified more than 110 solar photovoltaic system installers.
- The **Future Movers programme in the Philippines** trains young people and certifies trainers in technical and vocational skills to increase employability and



Clifford was one amongst the 2 million unemployed Filipinos in 2018. The Rooftop Solar PV System Installers Training Program, under the project AccessRE, provided Clifford with new avenues for learning, on-site installation training, and access to employment opportunities in the solar industry. (Photo: ASSIST)

drive economic recovery in post-conflict Marawi. Since inception, it has trained more than 780 youth and certified more than 660 trainers.





SECTION 7

# Appendix



# Appendix

## Overview of Six ASEAN Markets

	Indonesia	Malaysia	Philippines	Singapore	Thailand	Vietnam
GDP, US\$B	1,186	373	394	397	506	366
GDP per capita, US\$	4,300	11,100	3,500	72,800	7,100	3,800
Population, M	274	34	114	5.5	72	97
Land size, km <sup>2</sup>	1.9M	328,600	298,200	718	510,900	313,400
Share of urban population	57%	78%	48%	100%	52%	38%
Urbanisation rate, %* (2020-2025 est.)	2.0%	1.9%	2.0%	0.7%	1.4%	2.7%
Employment rate, %	65%	62%	55%	66%	66%	73%
Informal employment, %	59%	8.3**%	N/A	N/A	52%	57%
Average years of schooling	8	10.2	9.3	11.5	7.6	8.2
Vehicle ownership*** (per 1,000 people)	~470	~870	~90	~170	~530	~20

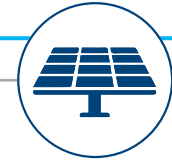
\*Annual rate of change of percentage of urban population.

\*\*Informal employment in informal sector (no data on formal sectors).

\*\*\*Calculated based on total number of passenger cars and motorcycles in each country (does not include trucks, lorries, or other kinds of vehicles).

**Sources:** GDP: [World Bank \(2021\)](#); GDP per capita: [World Bank \(2021\)](#); Population: [World Bank \(2021\)](#); Land size: [World Bank \(2020\)](#); Share of urban population: [World Bank \(2021\)](#); Urbanisation rate: [UN Data](#); Employment rate: [World Bank \(2021\)](#); Informal employment: [Indonesia Informal Employment Statistics \(2021\)](#), [Informal Sector Work Force Survey Report, Malaysia, 2019](#), [Thailand Informal Employment Survey 2021](#), [2016 Report on Informal Employment in Viet Nam](#); Average years of schooling: [Our World in Data \(2017\)](#); Vehicle ownership: [ASEANStatsDataPortal](#); Population total: [World Bank \(2021\)](#).

# High-Potential Jobs by Sector<sup>39</sup>



## High-Potential Jobs in Solar

Green job	Skill level	Key responsibilities	Skills/credentials required	Health & safety risks	Career progression prospects
Maintenance personnel or cleaners	Low	Clean panels	<ul style="list-style-type: none"> <li>No educational requirements</li> <li>Physical strength required</li> <li>Safety training is provided</li> </ul>	<ul style="list-style-type: none"> <li><b>Some safety risk</b> (e.g. electrocution, accidents, falling from heights)</li> </ul>	<ul style="list-style-type: none"> <li><b>Unlikely</b></li> </ul>
Installation workers or solar technologists	Medium	Install equipment	<ul style="list-style-type: none"> <li>No requirements</li> <li>Physical strength required</li> </ul>	<ul style="list-style-type: none"> <li><b>Some safety risk</b> (e.g. electrocution, accidents)</li> <li><b>Challenging work conditions</b> (e.g. physical work in the sun)</li> </ul>	<ul style="list-style-type: none"> <li><b>Likely:</b> Opportunity to advance (e.g. supervisor, project manager, senior project manager)</li> </ul>
Operators	Medium	Run shifts at solar farm; troubleshoot as needed	<ul style="list-style-type: none"> <li>Vocational certificate</li> </ul>	<ul style="list-style-type: none"> <li><b>Some safety risk</b> (e.g. electrocution, accidents, falling from heights)</li> </ul>	<ul style="list-style-type: none"> <li><b>Likely</b></li> </ul>
Monitoring personnel	Medium	Oversee buildings with installed solar capacity or solar farms	<ul style="list-style-type: none"> <li>Diploma in electrical engineering</li> </ul>	<ul style="list-style-type: none"> <li><b>Some safety risk</b> (see above)</li> </ul>	<ul style="list-style-type: none"> <li><b>Likely</b></li> </ul>
Factory workers and technicians	Medium to high	Work on production line and operate machinery	<ul style="list-style-type: none"> <li>Secondary school to diploma</li> </ul>	<ul style="list-style-type: none"> <li><b>Some safety risk</b> (e.g. from operating machinery, use of mercury in production)</li> <li>Usually well managed by proper use of PPE</li> </ul>	<ul style="list-style-type: none"> <li><b>Possible or limited:</b> Requires further education; supervisors require a diploma, usually in engineering</li> </ul>
Electrical technicians	High	Install electrical systems and coordinate installation workers	<ul style="list-style-type: none"> <li>Vocational certificate in electrical engineering</li> </ul>	<ul style="list-style-type: none"> <li><b>Some safety risk</b> (e.g. electrocution, accidents)</li> <li><b>Challenging work conditions</b> (e.g. physical work in the sun)</li> </ul>	<ul style="list-style-type: none"> <li><b>Likely:</b> Opportunity to advance (e.g. supervisor, project manager, senior project manager)</li> </ul>
Facilities managers	High	Ensure systems run smoothly	<ul style="list-style-type: none"> <li>Diploma required</li> <li>Facilities management courses are a plus</li> </ul>	<ul style="list-style-type: none"> <li><b>Some safety risk</b> (e.g. electrocution, accidents, falling from heights)</li> </ul>	<ul style="list-style-type: none"> <li><b>Likely:</b> Opportunity to advance (e.g. supervisor of whole solar farm, head of project team)</li> </ul>

Source: Bridgespan Group interviews with sector experts

39 Skill levels based on the International Labour Organization's [International Standard Classification of Occupations](#).



## High-Potential Jobs in Built Environment

Green job	Skill level	Key responsibilities	Skills/credentials required	Health & safety risks	Career progression prospects
Construction labourers	Low	Provides general labour at construction site (no specific trade skills); may assist tradespeople	<ul style="list-style-type: none"> <li>Primary school; basic literacy required</li> <li>Physical strength required</li> </ul>	<ul style="list-style-type: none"> <li><b>Significant risks</b> (e.g. electrocution, exposure to toxic chemicals, falling from heights)</li> </ul>	<ul style="list-style-type: none"> <li><b>Unlikely</b></li> </ul>
Electrical technicians	High	Install and test electrical systems	<ul style="list-style-type: none"> <li>Vocational certificate</li> </ul>	<ul style="list-style-type: none"> <li><b>Significant risks</b> (see above)</li> </ul>	<ul style="list-style-type: none"> <li><b>Possible or limited:</b> Likely takes time</li> </ul>
Mechanical technicians	High	Work on mechanical HVAC, fire protection	<ul style="list-style-type: none"> <li>Vocational certificate</li> </ul>	<ul style="list-style-type: none"> <li><b>Significant risks</b> (see above)</li> </ul>	<ul style="list-style-type: none"> <li><b>Possible or limited</b></li> </ul>
Sales or leasing representatives	Medium	Sell or lease products	<ul style="list-style-type: none"> <li>Secondary education</li> </ul>	<ul style="list-style-type: none"> <li><b>No significant risks</b></li> </ul>	<ul style="list-style-type: none"> <li><b>Possible:</b> Entry salary is often commission-based</li> </ul>
Sustainability consultants	High	Assess carbon lifecycle of a building	<ul style="list-style-type: none"> <li>Certification in related field required; should understand basics of carbon accounting and reporting</li> </ul>	<ul style="list-style-type: none"> <li><b>No significant risks</b></li> </ul>	<ul style="list-style-type: none"> <li><b>Likely</b></li> </ul>
Facilities managers	High	Ensure building is running as intended, address any repairs, and coordinate with stakeholders	<ul style="list-style-type: none"> <li>Diploma required</li> </ul>	<ul style="list-style-type: none"> <li><b>No significant risks</b></li> </ul>	<ul style="list-style-type: none"> <li><b>Possible or limited:</b> Can become building manager but takes time and further progression is difficult</li> </ul>
Building planning officers	High	Allocate budget for the building	<ul style="list-style-type: none"> <li>Diploma in engineering or any STEM field</li> </ul>	<ul style="list-style-type: none"> <li><b>No significant risks</b></li> </ul>	<ul style="list-style-type: none"> <li><b>Possible or limited</b> (see above)</li> </ul>
Building project officers	High	Coordinate building projects (e.g. renovation projects)	<ul style="list-style-type: none"> <li>Diploma</li> </ul>	<ul style="list-style-type: none"> <li><b>No significant risks</b></li> </ul>	<ul style="list-style-type: none"> <li><b>Possible or limited</b> (see above)</li> </ul>
Software developers	High	Develop applications to maintain utility usage and other functions	<ul style="list-style-type: none"> <li>Diploma required</li> </ul>	<ul style="list-style-type: none"> <li><b>No significant risks</b></li> </ul>	<ul style="list-style-type: none"> <li><b>Likely</b></li> </ul>

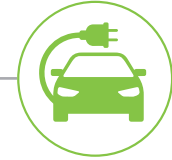
Source: Bridgespan Group interviews with sector experts



## High-Potential Jobs in Sustainable Farming

Green job	Skill level	Key responsibilities	Skills/credentials required	Health & safety risks	Career progression prospects
<b>Crop protection applicators</b>	Low	<ul style="list-style-type: none"> <li>Apply fertilisers or chemicals to crops</li> </ul>	<ul style="list-style-type: none"> <li>No educational requirements</li> <li>Physical strength required</li> </ul>	<ul style="list-style-type: none"> <li><b>Significant risks</b> (from intense manual labour and exposure to dangerous compounds)</li> <li>Some but not all agribusinesses employ use of protective gear</li> </ul>	<ul style="list-style-type: none"> <li><b>In large agribusinesses:</b> Limited</li> <li><b>In smallholder farms:</b> Unlikely</li> </ul>
<b>Agricultural workers/farmers/breeders</b>	Low	<ul style="list-style-type: none"> <li>Produce and care for crops/livestock</li> </ul>	<ul style="list-style-type: none"> <li>No educational requirements</li> <li>Physical strength required</li> <li>Knowledge of climate-resilient practices required in green operations; training typically given by government or civil society</li> </ul>	<ul style="list-style-type: none"> <li><b>Significant risks</b> (see above)</li> </ul>	<ul style="list-style-type: none"> <li><b>In large agribusinesses:</b> Limited</li> <li><b>In smallholder farms:</b> Unlikely</li> </ul>
<b>Factory workers</b>	Low to medium	<ul style="list-style-type: none"> <li>Input materials into machines and clean facility</li> </ul>	<ul style="list-style-type: none"> <li>Secondary education or vocational certificate</li> </ul>	<ul style="list-style-type: none"> <li><b>Some health and safety risks</b> (from operating heavy machinery)</li> </ul>	<ul style="list-style-type: none"> <li><b>Possible or limited:</b> Degree required for management roles</li> </ul>
<b>Machine operators</b>	Medium	<ul style="list-style-type: none"> <li>Operate heavy equipment in production facilities</li> </ul>	<ul style="list-style-type: none"> <li>No educational requirements above basic literacy/numeracy</li> <li>Physical strength required</li> </ul>	<ul style="list-style-type: none"> <li><b>Some safety risks</b> (see above)</li> </ul>	<ul style="list-style-type: none"> <li><b>Possible or limited</b> (see above)</li> </ul>
<b>Sales representatives</b>	Medium	<ul style="list-style-type: none"> <li>Make sale and communicate with key client accounts</li> </ul>	<ul style="list-style-type: none"> <li>Vocational certificate preferred</li> <li>Sales skills and experience more valued than educational credentials</li> </ul>	<ul style="list-style-type: none"> <li><b>No significant risks</b></li> </ul>	<ul style="list-style-type: none"> <li><b>Possible or limited</b> (see above)</li> </ul>
<b>Maintenance technicians</b>	High	<ul style="list-style-type: none"> <li>Maintain and repair machinery</li> </ul>	<ul style="list-style-type: none"> <li>Vocational certificate in engineering</li> </ul>	<ul style="list-style-type: none"> <li><b>Some health and safety risks</b> (from operating heavy machinery)</li> </ul>	<ul style="list-style-type: none"> <li><b>Possible or limited</b> (see above)</li> </ul>

Source: Bridgespan Group interviews with sector experts



## High-Potential Jobs in Electric Mobility

Green job	Skill level	Key responsibilities	Skills/credentials required	Health & safety risks	Career progression prospects
Plant floor or assembly worker	Medium	<ul style="list-style-type: none"> <li>Assemble components to make the final vehicle</li> </ul>	<ul style="list-style-type: none"> <li>Secondary education</li> </ul>	<ul style="list-style-type: none"> <li><b>Some risks</b> (e.g. injury from heavy machinery, electrocution) but highly regulated</li> </ul>	<ul style="list-style-type: none"> <li><b>Possible or limited:</b> Longer-term advancement takes more time</li> </ul>
Charging infrastructure installers	Medium	<ul style="list-style-type: none"> <li>Check for on-site power, conduct installation, and coordinate with clients</li> </ul>	<ul style="list-style-type: none"> <li>Vocational certificate; electrical backgrounds preferred</li> <li>Work experience preferred</li> </ul>	<ul style="list-style-type: none"> <li><b>Some risk:</b> Challenging work conditions (e.g. odd working hours, unsheltered areas)</li> </ul>	<ul style="list-style-type: none"> <li><b>Likely</b></li> </ul>
Sales representatives	Medium	<ul style="list-style-type: none"> <li>Sell product and service accounts</li> </ul>	<ul style="list-style-type: none"> <li>Secondary education</li> <li>Soft skills prioritised over credentials</li> </ul>	<ul style="list-style-type: none"> <li><b>No significant risks</b></li> </ul>	<ul style="list-style-type: none"> <li><b>Likely</b> (e.g. sales leader, sales manager)</li> </ul>
Technicians	High	<ul style="list-style-type: none"> <li>Check process and equipment</li> </ul>	<ul style="list-style-type: none"> <li>Vocational certificate</li> </ul>	<ul style="list-style-type: none"> <li><b>Some risks</b> (e.g. injury from heavy machinery, electrocution) but highly regulated</li> </ul>	<ul style="list-style-type: none"> <li><b>Likely</b></li> </ul>
Software developers	High	<ul style="list-style-type: none"> <li>Develop and maintain charging system</li> <li>Continuously update the app</li> </ul>	<ul style="list-style-type: none"> <li>Diploma or degree preferred</li> <li>Candidates can be self-taught in coding or programming</li> </ul>	<ul style="list-style-type: none"> <li><b>No significant risks</b></li> </ul>	<ul style="list-style-type: none"> <li><b>Possible or limited:</b> Career advancement typically takes a long time</li> </ul>
Electric technicians/ After-sales service technicians	High	<ul style="list-style-type: none"> <li>Repair and maintain vehicles</li> </ul>	<ul style="list-style-type: none"> <li>Vocational certificate or university degree</li> </ul>	<ul style="list-style-type: none"> <li><b>No significant risks</b></li> </ul>	<ul style="list-style-type: none"> <li><b>Possible or limited</b></li> </ul>

Source: Bridgespan Group interviews with sector experts



## High-Potential Jobs in Waste Management

Green job	Skill level	Key responsibilities	Skills/credentials required	Health & safety risks	Career progression prospects
Waste pickers	Low	<ul style="list-style-type: none"> <li>Collect household and public-area waste daily</li> </ul>	<ul style="list-style-type: none"> <li>No educational requirements</li> <li>Physical fitness required</li> <li>Training is typically covered by employer in &lt;1 day if the job is formalised</li> </ul>	<ul style="list-style-type: none"> <li><b>Significant risks</b> (e.g. close exposure to hazardous waste, labour intensity)</li> <li>Risks are especially high in developing markets</li> </ul>	<ul style="list-style-type: none"> <li><b>Unlikely</b></li> </ul>
Waste transporters/ drivers	Low	<ul style="list-style-type: none"> <li>Transport waste and waste collection crews along planned routes</li> </ul>	<ul style="list-style-type: none"> <li>No educational requirements</li> <li>Physical fitness required and license to operate heavy vehicles required</li> </ul>	<ul style="list-style-type: none"> <li><b>Some risks</b> (e.g. road accidents, especially due to long hours)</li> </ul>	<ul style="list-style-type: none"> <li><b>Unlikely</b></li> </ul>
Waste and recycling segregators	Low	<ul style="list-style-type: none"> <li>Sort recyclables from other waste items in the sorting line</li> </ul>	<ul style="list-style-type: none"> <li>No educational requirements</li> <li>Physical fitness required</li> <li>Training is typically covered by employer if the job is formalised</li> </ul>	<ul style="list-style-type: none"> <li><b>Significant risks</b> (e.g. close exposure to hazardous waste and labour intensity)</li> <li>Risks are especially high in developing markets</li> </ul>	<ul style="list-style-type: none"> <li><b>Unlikely</b></li> </ul>
Machine operators	Medium	<ul style="list-style-type: none"> <li>Operate machines or heavy vehicles for processing or transporting waste</li> </ul>	<ul style="list-style-type: none"> <li>Secondary education</li> </ul>	<ul style="list-style-type: none"> <li><b>Safety risks</b> from working with machinery</li> <li>Some exposure to waste items</li> </ul>	<ul style="list-style-type: none"> <li><b>Possible or limited</b> (e.g. team lead, administrative officer)</li> </ul>
Maintenance technicians	High	<ul style="list-style-type: none"> <li>Maintain and repair machines for processing or transporting waste</li> </ul>	<ul style="list-style-type: none"> <li>Vocational or diploma in engineering</li> </ul>	<ul style="list-style-type: none"> <li><b>Safety risks</b> (see above)</li> </ul>	<ul style="list-style-type: none"> <li><b>Likely</b> (e.g. head technician, plant supervisor)</li> </ul>

Source: Bridgespan Group interviews with sector experts



## THE BRIDGESPAN GROUP

**BOSTON** 2 Copley Place, 7th Floor, Suite 3700B, Boston, MA 02116 USA. Tel: +1 617 572 2833

**JOHANNESBURG** Bridgespan Africa, The MARC, Tower 1, 3rd Floor, Corner Maude and Rivonia Road, Sandown Johannesburg, South Africa.  
Tel: +27 11 012 9280

**MUMBAI** Bridgespan India Private Limited (registered address), 11th Floor, Platina, G Block, Plot C 59, Bandra Kurla Complex, Mumbai, 400051, India.  
Tel: +91 022 6628 9624

**NEW YORK** 333 Seventh Avenue, 11th Floor, New York, NY 10001 USA. Tel: +1 646 562 8900

**SAN FRANCISCO** 88 Kearny St., Ste. 200, San Francisco, CA 94108 USA. Tel: +1 415 627 4500

**SINGAPORE** The Bridgespan Group, Sponsored by Bain Singapore, 38 Beach Road, 15th Floor, South, Beach Tower, Singapore 189767



[www.bridgespan.org](http://www.bridgespan.org)

[contact@bridgespan.org](mailto:contact@bridgespan.org)  
[contactindia@bridgespan.org](mailto:contactindia@bridgespan.org)

This work is licensed under the Creative Commons BY-NC-ND License.  
To view a copy of this license, visit <http://www.bridgespan.org/about-us/terms-and-conditions>