Chapter 2: Case Study of Indonesia

1 Aspiring to move from an emerging to an advanced economy

Figure 2.1 Map of Indonesia

Source: Recreated using d-maps.com

Indonesia has had one of the most successful economic runs in the last decade amongst emerging economies. Since achieving democracy in 1999, the country has had a consumer boom, it has been a preferred foreign investment destination, has a domestic market of nearly 250 million people (the fourth largest in the world) and it has benefitted from a heavy demand for its reserves in oil and coal. However, there have been major setbacks since 2012 which have had serious economic consequences for the country. The near 20% fall in the value of the Rupiah against the United States (US) dollar in 2013, the slowing of GDP growth (Figure 2.2) and the spike in inflation (from nearly 4% to over 8.5%) are serious challenges for the country’s economy.

Figure 2.2 Indonesia GDP annual growth rate

Source: Trading economics, 2014
A combination of factors led to the phenomenal rise of the Indonesian economy such as the global economic upsurge, the upbeat mood of people after attaining democracy, and the progressive policies of the Government. But the real test for Indonesia was its survival during the global economic crisis in 2008. Policies such as the Master plan for Acceleration and Expansion of Indonesia Economic Development (MP3EI) implemented with a spirit of “not business as usual” paved the way for stable growth. GDP has been growing at a steady 6%, even in times of downturn. Many economists believe that the current economic crisis in the country could be short-term if the recent restrictive policies on matters such as mining export and foreign investment rules are revisited and made more progressive.

The earlier economic up-swing also had an impact on social indicators. The per capita GDP increased almost fourfold from US$804 to US$3468 in 2013 (World Bank, 2014). The proportion of the population living in poverty halved, from 24% in 1999 to 12% in 2012. The Human Development Index (HDI) has improved from 0.54 in 2000 to 0.62 in 2012 (an improvement of nearly 15%), although the rank remains low at 121 out of 187 countries. The literacy rate has reached an all-time high of 95.8%. Even with such encouraging numbers, unfortunately the benefits of growth have not been evenly distributed.

According to a World Bank report, the average growth in real per capita consumption between 2003 and 2010 was about 4%, for the poorest 40% household growth was 1.3%, 3.5% for the next 40% and nearly 6% for the top 20% of households (Figure 2.3). The small increase in real income in the poorest households makes them vulnerable to sudden price rises, natural disasters and health issues. Almost 65 million people hovered around the national poverty line, in addition to the nearly 27 million (12% of 230 million) declared as living below the poverty line. Seventy percent of the population live on the island of Java, which accounts for a mere 6% of the land area of the country. In recent years, several million migrants from other islands have moved to Jakarta and other major cities in search of employment but end-up with jobs in low-end services, hawking food by the roadside or selling from handcarts. They are part of a vast informal economy, which accounts for some 70% of GDP. They rarely earn the official minimum wage and receive few government benefits (The Economist, March, 2014).

**Figure 2.3** Average growth in real consumption over 2003-2010 across different household consumption percentile

Note: A Growth Incidence Curve (GIC) shows the annual growth rate in consumption between two periods for each percentile of the distribution. Thus, the GIC indicates how the average consumption growth for all households is distributed across the distribution.

Source: World Bank, March 2014
According to the International Monetary Fund (IMF), 93% of the difference in GDP per capita (a proxy for prosperity) across nations are explained by differences in aggregate labour productivity (Figure 2.4, Figure 2.5), and therefore Indonesia’s turnaround hinges upon its 118 million strong labour force, with 35% in agriculture, 22% in industry and 43% in services. Out of the 118 million workforce, 73 million (62%) are male and 45 million (38%) are female. However, the education levels of those in the workforce are worrying, with only 31.4% having attained secondary education and above. Nearly 48% have either completed primary education or less, although this category has come down significantly from 68.4% in 1994. Low levels of education and the informal nature of employment, makes the category more vulnerable to exploitation and poverty.11

**Figure 2.4   Labour indicators**

![Labour indicators graph](image)

Note: Data refer to August unemployment rates.


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Figure 2.5  Labour productivity (based on employment)

![Graph showing labor productivity](image)

Source: Asian Productivity Organisation (APO) Productivity online database

Box 2.1  Challenges for Indonesia

For Indonesia, one of the hardest challenges in regard to green jobs, is to find a balance between the three stated targets of the government, namely, 1) the target to reduce greenhouse gases by 26% (or 41% with international assistance) by 2020; 2) to meet economic growth of 7.7% by 2014, and 3) to create 11.7 million jobs between 2010 and 2014.

Source: Gunawan and Fraser, 2012, page 1

1.1  Policy environment for green growth

In the Asia-Pacific region, the enormity of the informal economy, and the transition from primary (agriculture/mining) to the secondary and tertiary (manufacturing and services) sectors, is creating enormous and increasing pressure on generating employment and opportunities to trade, not only within countries but also across countries. While high domestic consumption is driving-up these economies, global trade arrangements, environmental mandates, human development policies and what has been called a “resource crunch” are having a cascading effect on the performance of industries and their competitiveness, and are forcing businesses to be myopic, looking at short-term profits rather than medium to long-term benefits and gains.

The growth in Indonesia over the last decade has had an impact on the environment and on the sustainability of resources. The total energy consumption in Indonesia was 220 million tonnes of oil equivalent (Mtoe) (2013), low compared to China (2712 Mtoe), United States of America (USA) (2152 Mtoe) and India (774 Mtoe) (Enerdata, 2013). However the rise in consumption has been meteoric since 1990 when it was only 99 Mtoe. The change in Carbon Dioxide (CO2) emissions has been more dramatic, increasing from 150 million tonnes of CO2 in 1990 to 275
million tonnes of CO₂ in 1999, to 467 million tonnes of CO₂ in 2012, almost a threefold rise. In addition, natural disasters such as floods, droughts, tsunamis, earthquakes and volcanoes have left the country’s flora, fauna and mineral resources subject to significant risk.

Indonesia is party to several international environmental protection agreements, including biodiversity, climate change, climate change-Kyoto protocol, desertification, endangered species, hazardous wastes, law of the sea, ozone layer protection, ship pollution, Tropical Timber 83, Tropical Timber 94, wetlands, and the whaling and marine life conservation agreement (Central Intelligence Agency, 2014). In addition, the government has enacted a number of laws, regulations and initiatives such as the National Emission Reduction Plan, Indonesia Climate Change Trust Fund, Energy Conservation Clearing House, Energy Awards, Green Industry Awards and laws on Green House Gas (GHG) emissions, energy conservation and environmental protection which are both preventive and corrective in nature. The National Council on Climate Change (NCCC) chaired by the President is the apex government body for climate change policy coordination and development.

Overall the Indonesian Government’s agenda is pro green and supports inclusive growth. Law of the Republic of Indonesia No.17/2017 on the Long Term National Plan 2005-2025 promotes a green agenda through three sectors: climate change adaptation for food security, the development of alternative energy and disaster management.

The Government has introduced a number of Presidential decrees, laws and policy frameworks. The Masterplan for the Acceleration and Expansion of Economic Development of Indonesia (MP3EI) crafted by the State Ministry of National Development and Planning / BAPPENAS and formalized by the Presidential Regulation No. 32 / 2011 was designed to support Indonesian transformation into a developed country by 2025. In doing so, many millions of people will be lifted out of poverty, and given better access to quality education, employment, higher living standard and medical care. A stronger middle class will also mean that the country and its citizens will have higher purchasing power and the increased ability to compete in the global arena.

A number of Nationally Appropriate Mitigation Actions (NAMA) frameworks have been formulated, covering; energy, the industry sector, transport, waste management, and land-based sectors. Along with these, climate change sectoral roadmaps have been developed several presidential regulations and laws have been passed. These range from laws on the regulation of CO₂ emissions, waste management, and renewable energy to eco-tourism and community training on environmental sustainability in exploration, exploitation and rehabilitation of the environment. Many of these laws and regulations are relevant across ministries and have an environmental, economic and social dimension to them: for example, Government Regulation No. 70/2009 deals with energy conservation and promotes the active participation of government, private and community partners.

While a number of policies and programmes by different government ministries and departments have an acknowledgement of green issues, implementation is yet to happen on a large scale. For example, the target for energy generation from renewable sources is 23% by 2025 while current production is approximately 6%. The rate of growth of renewable energy is slow even though the government introduced a new Feed in Tariff (FIT)¹² for biomass.

¹² FITs are a policy mechanism designed to accelerate investment in renewable energy pointing to the government’s interest in diversifying energy sources.
substantially increased FIT rates for geothermal power and initiated reductions in fossil fuel subsidies. Performance rating programmes such as Program for Pollution Control, Evaluation and Rating (PROPER), to improve environmental compliance by companies, particularly in relation to water pollution control regulations, air pollution control, hazardous waste management, marine pollution control and environmental impact assessments, have greater compliance by larger companies compared to small and medium enterprises (SME). At the provincial level, pro-environment initiatives are also being promoted such as prohibition of control landfills in Jakarta being replaced by sanitary landfills (2013).

Some of the important stakeholders in Indonesia with respect to environment and climate change issues are:

- National Board on Climate Change
- National Board on Development Planning (BAPPENAS)
- Ministry of Energy and Mineral Resources (Directorate of Energy Conservation)
- Ministry of Environmental Affairs
- Ministry of Industry
- Indonesia Chamber of Commerce (KADIN)

Although the government has been active in setting up greening policies, the number of greening initiatives. Some examples are provided as follows.

Green Development Pilot Project, BAPPENAS - in Collaboration with the Global Green Growth Institute (GGGI), the State Ministry of National Development and Planning / BAPPENAS is conducting a pilot project to develop the concept of green development in the provinces of East Kalimantan and Central Kalimantan. The project will introduce several green concepts, such as Green Farming (mongabay.co.id).

Green Jobs Programme, Kutai Kertanegara local government - the government of kutai kertanegara has initiated the Gerbang Raja green jobs program, with targets to be achieved by 2025. As part of the programme, the local government has developed biogas as an energy alternative produced from cattle dung, developed biodiesel from coconut oil, utilized ex mining pits as fisheries, introduced water friendly plants as cattle food, and introduced the use of solar cells for remote communities (antara.com).

Energy Award for companies, Ministry of Energy and Mineral Resources - the Energy Award is an award in the energy field presented by the Government, in this case, the Ministry of Energy and Mineral Resources, to stakeholders who have rendered great service in the development, provision and utilization of energy in accordance with the principle of conversion and/or diversification, that have created physically real product as the result of the innovation and development of new technology that have big impact to the surrounding communities, to the improvement of the role and performance in the energy and mineral resources sector as well as to the nation and the country.

Green Industry Awards, Ministry of Industry - the ministry of industry provides the Green Industry Awards for industries who have conducted its activities on the basis of resource
savings, including the use of raw materials and energy, especially renewable and environmentally friendly energy. In 2010 – 2012, there were approximately 160 companies voluntarily following the green industry awards. This award is one of the incentives that are expected to drive the industry to realize a green industry.

Although there are many initiatives from Government in relation to industry and economic development, there is less priority given to development of green skills. Although there is no systematic approach towards policies in green skills development, there are many initiatives across the country.
Box 2.2 Policies and initiatives towards green growth, climate change and green jobs in Indonesia

### Policies

- Law of the Republic of Indonesia No. 4/1982 on the basic provisions of environmental management
- Law of the Republic of Indonesia No. 23/1997, regulating environmental management
- Presidential Regulation No. 5/2006 on National Energy Policy
- Law of the Republic of Indonesia No. 30 / 2007 on the National Energy Policy
- Presidential Instruction No. 13 of 2011, providing instructions to save energy and limit water usage.
- Presidential Regulation No. 61 / 2011 on reducing GHG emissions
- Green Building Regulation, Ministry of Public Works
- Presidential Regulation No. 41/2013 on Luxury Tax of Vehicles concerning with Low Cost Green Car (LCGC) and Low Emission Carbon (LEC)

### Initiatives (Government, NGOs and Industry)

- National Emission Reduction Plan
- National Action Plan for Climate Change
- Indonesian Climate Change Trust Fund
- Establishment of Energy Conservation Clearing House
- Energy Award for companies, Ministry of Energy and Mineral Resources
- Green Industry Awards, Ministry of Industry
- Green Development Pilot Project, BAPPENAS
- Green Jobs Programme, Kutai Kertanegara Local Government
- Green School Programme, Ministry of Religion
- Rimba Raya Biodiversity Reserve
- Kalimantan Green Growth Planning
- Port Greening and Environmental Cleanliness Programme, PT Pelabuhan Indonesia II
- ILO Study on Green Jobs in Indonesia
- Green Livelihood Access for Central Kalimantan’s Inclusive Environmental Response to Climate Change (GLACIER) project
- Indonesian Green Entrepreneurship Programme (IGEP)
- Strategic Plan for Sustainable Tourism and Green Jobs
- Tangsi Renewable Energy-Based Economically Independent Village

Source: EdUHK Team Analysis
1.2 Education and training

In many Asian economies, including Indonesia, the unemployment rate amongst the educated is much higher than for the country average. In Indonesia, unemployment amongst those who have attained secondary education (vocational) is nearly 12% compared to the country average of about 6.25% (August, 2013).11

The progressive intent of the government is evident through aspects of the policy push which the government has taken through both the general education system and the vocational education system. The government has stipulated, in an amendment of its constitution, and as enforced in National Law No. 20 / 2003, that the government shall allocate 20% of its national budget for education. This expenditure is higher than for any other sector. The impact in terms of expanding access is indicated through the vast network of 90,557 kindergartens, 165,491 primary schools, 43,888 lower secondary schools, 25,332 upper secondary schools (including 8,399 vocational schools), and 3,629 institutions of higher education13 - spread across the 6000 inhabited islands of the country. The quality of education also appears to be improving as increasing numbers of students complete the education cohort. Those achieving lower secondary and above has gone up from 31% in 1994 to 52% in 2013.

Whilst most vocational secondary schools are in the private sector, with just 26.4% vocational schools in the public sector, the government has played a regulatory role by setting frameworks and standards for vocational education.

Some of the proactive initiatives by the government to improve the education system and its quality are:

- the setting up of the Indonesian National Qualifications Framework (KKNI, Kerangka Kualifikasi Nasional Indonesia) in 2011;

- the launch of a new curriculum in 2013 which mandates changes in teaching and learning for primary education up to higher secondary education, including vocational education; and

- the setting up of the Badan Standar Nasional Pendidikan (BSNP - National Education Standards Agency) responsible for developing, monitoring and evaluating the implementation of national education standards.

The TVET system in Indonesia consists of the Vocational Education System (Sistem Pendidikan Kejuruan) that is a part of the National Education System (Sistem Pendidikan Nasional) governed by the Education Act (Law No. 20/2003) and the National Training System for Work (Sistem Pelatihan Kerja Nasional - Sislatkernas), governed by the Manpower Act (Law No. 13/2003). The planning council, National Board on Development Planning (BAPPENAS), is responsible for the co-ordination of development planning including between the Ministry of Education and Culture and the Ministry of Manpower and Transmigration of Indonesia.

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TVET in the Indonesian education system is delivered at three educational levels (Figure 2.6):

**Level I** TVET in secondary schools - for example; SMK under the Ministry of Education and Culture (MoEC); Vocational Secondary School in Industrial Technology (SMTI) under the Ministry of Industry; Vocational Secondary School in Agriculture and Development (SMK PPN) under the Ministry of Agriculture; Vocational Forestry Secondary School (SMKK) under the Ministry of Forestry and Islamic Vocational Secondary School (MAK), under the Ministry of Religious Affairs.

**Level II** TVET in post-secondary education, examples being Vocational Training Centre (BLK) of the Ministry of Manpower and Transmigration (MoMT); Industrial Training Centre (BDI) of the Ministry of Industry and Agricultural Training Centre (BPP) of the Ministry of Agriculture. The features of this type of TVET are; (1) short period of training/short courses; (2) most of the participants are secondary school graduates; (3) the course/s offered is/are not fixed as in secondary or tertiary level education.

**Level III** TVET in the tertiary education where it may be a component of or an extension to an undergraduate/postgraduate programme or an independent vocational course. There are three designations: the Diploma (one to four year Diploma Programme), the Politeknik (polytechnic) and the Sekolah Tinggi (advanced schools).

![Figure 2.6 TVET as a part of the Indonesian education system](image-url)

<table>
<thead>
<tr>
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<th>Level</th>
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<th>Vocational Education</th>
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Remarks: Strata 1, 2, 3 (S1, S2, S3) are equivalent to Bachelor, Master, Ph.D. Specialist programmes are programmes for academic and/or professional further education. Basic education is compulsory and free of charge. Pre-school is optional.

Source: UNESCO-UNEVOC, 2011
There are more than 10,640 SMKs (2826 – public, 7814 – private) (Presentation at the East Asia Summit (ESA) TVET providers network, 2012). There are about 7,600 secondary vocational schools (26% public), 130 polytechnics (21% public), 950 Akademi14 (all private), 16 public university-level institutions with TVET teacher education programmes, 6 public centres for the development and empowerment of teachers and educational personnel (P4TK), and 5,900 training institutes (3.5% public).

SMKs offer three year certificate programmes at National Qualification Framework (NQF) 2 level (Figure 2.6). Some SMKs, also called SMK Plus, offer extended programmes of four years. Polytechnics (Politeknik), Advanced Schools (Sekolah Tinggi) and Academies (Akademi) offer Diploma Programmes at the levels D2, D3, and D4 (e.g. D3 is a three year programme).14 Diploma Programmes are also offered by some universities and institutes. In addition, there are specialist professional programmes offered by universities for further training, usually for holders of at least a Bachelor degree. Community colleges are newly established institutions contributing to the expansion of higher education in TVET.

In 2012 there were 35 newly established state Community colleges targeted to expand to 269 by 2015 (Table 2.1). The government has ambitious plans to significantly expand its formal TVET offerings with the goal of changing the ratio of students enrolled in general upper-secondary education (SMUs) to vocational upper-secondary schools (SMKs) to 40:60 by 2015.

<table>
<thead>
<tr>
<th>No</th>
<th>Action plan</th>
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<tr>
<td>A.1</td>
<td>Development of Community College (Unit)</td>
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<td>A.2</td>
<td>New polytechnics (unit)</td>
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<td>A.3</td>
<td>New university (unit)</td>
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<td>Increasing student body at Polytechnics</td>
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<td>A.5</td>
<td>Increasing student body at university/institute</td>
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<td>A.6</td>
<td>Increasing lecturers</td>
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<td>M.2</td>
<td>Research University (unit)</td>
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<td>M.3</td>
<td>Increasing lecturer with PhD level (%)</td>
<td>15%</td>
</tr>
</tbody>
</table>

Source: An Overview of Indonesia TVET System. Presentation at EAS TVET Provider Network Workshop, Friday, November 16, 2012 – Melbourne, Australia

The Ministry of Education and Culture and its Directorate for Technical and Vocational Education take responsibilities for the planning and development of SMKs, retraining TVET teachers, developing curriculum guidelines, and normative and adaptive parts of the

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14 Academies provide instruction in only one field; most offer diplomas and certificates for technician-level courses in applied science, engineering, or art at both public and private institutions. Advanced schools provide academic and professional university-level education in one particular discipline. Polytechnic schools are attached to universities and provide education at the level of junior technician
curriculum\textsuperscript{15} that are common for different specialisations, and developing standards that are the basis for curriculum development for productive subjects.

**Figure 2.7**  TVET qualifications in Indonesia: links between the levels of qualifications and National Qualification Framework

![Diagram showing the links between levels of education and qualifications in Indonesia.](image)

Source: ADB, 2012

In addition to the public network, there is a larger private vocational education network. According to a World Bank Report (2011), there are more than 25,000 private training centres with a capacity of 4.5 million students (compared to 50,000 students reached by public institutions). The National Accreditation Agency for Informal Educational Units (Badan Akreditasi Nasional Pendidikan Nonformal, or BAN-PNF) accredits the private training centres.

Targeting a 40:60 ratio between SMUs and SMKs by 2015, establishing community colleges, expanding vocational education and training at the higher education levels and the setting up of the Indonesian National Qualifications Framework are important breakthroughs in enhancing the image and attractiveness of TVET in Indonesia. However the challenges of image concerning TVET in society and industrial communities have been improved over recent years due to committed intervention by Government, gradually TVET as a viable option for youth as an educational pathway.

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\textsuperscript{15} Curriculum consists of three parts: normative (e.g. civic education, sports and culture), adaptive (English, Maths) and productive (vocational subjects)
1.3 **Green TVET Initiatives**

International studies (World Bank, 2012a) demonstrate that the attitude “growth first and greening later” does not work, therefore economic and social development should go hand-in-hand with greening. Skills development required for green growth presents a challenge for governments worldwide since it requires an adequate understanding of labour market needs and effective approaches towards implementation of TVET greening. It is difficult enough to achieve when TVET systems are well developed and relevant to the needs of particular countries. However, when the TVET system is expanding and changing to increase its relevance to the needs of the labour market and economic development, the task of greening becomes more complex. Therefore, Indonesia should seek to meet the dual challenge of developing and expanding TVET and simultaneously greening TVET.

The education system as a whole is making efforts to incorporate green content into training programmes. Different organisations and ministries have pilot projects and initiatives to raise awareness and mainstream the green agenda. For example, a number of senior secondary schools encourage students to green their campuses, produce compost and natural fertiliser and collect rain water in bio-pores. Some of them produce their own tools for activities required to realise the concept (bur, crushers). Water and energy saving, waste management (e.g. textile waste is used to produce additional items for sale, SMK 27) also contributes towards greening SMKs’ campuses. The Ministry of National Education and Culture (MoEC), the Ministry of Manpower and Transmigration, the Ministry of Tourism and the National Council on Climate Change (NCCC) have pilot projects for green skills development. The Ministry of Youth and Sports together with the Central Bank of Indonesia support the “Indonesian green entrepreneurship programme” aimed at increasing levels of entrepreneurship and at greening businesses.

**Box 2.3 Promoting a green agenda**

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“Academi Technik Mesin Industru (ATMI) Cikarang is located close to Jakarta in the middle of an industrial estate and there are plans to develop an eco-tech campus and focus on clean production. To show its commitment towards a green agenda, the institution built a “green building” where they used a number of innovative solutions in building design (e.g. monitoring and delivering fresh air into classrooms). Nine local design companies were involved in the competition, however, they were not able to find the required expertise among Indonesian architectural companies and involved international experts from Germany and Switzerland. “

Source: EdUHK Research Interview
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Greening of campuses is a relatively widespread practice in Indonesia. This movement has been encouraged by governments, including local governments.
All TVET providers acknowledge that the environmental protection agenda of the government is well known to them. Transitions to greater use of products and services that comply with environmental regulations have the greater impact on both secondary and tertiary TVET providers.

Box 2.5 Source of data presented in the figures in this research report

Unless otherwise specified all figures are based on EdUHK Team Analysis of data collected through the surveys and interviews undertaken for this ADB-EdUHK research study. In figures where a bar(s) is not shown, this indicates a zero response to a particular question.

Unless otherwise specified all data presented in the figures and tables in this research comes from analysis undertaken by the EdUHK Research Team of survey and interview data collected for this research study.
Figure 2.8  Response to question on changes in the programmes/courses of TVET is the result of the following aspects of green economic transitions

![Bar chart]

Although there are no specific subjects on environmental issues, general knowledge about the environment was included in science in the adaptive part of the curriculum (SMK 29, 38). In a new curriculum that is in place from 2013, science as a separate subject has been removed. Some other general subjects address environmental issues (SMKN38). Specific green skills are mainly included in health and safety modules that are different for different training programs. For air-conditioning, for example, refrigerant recovery and to the ways of processing electronic waste are included in safety competencies (SMK29). Several providers stated that energy saving and recycling are addressed in many majors (e.g., SMKN 38).

Some SMKs include green issues on their own initiative: “Principles of energy efficiency in building construction is not in curriculum but we included basic knowledge on insulations”, even though there are no government regulations on this (SMKN26). Although government recommends building refurbishment, it is not widely practiced in the industry (SMKN38), so it is difficult for students to see practical application of this green technology. “There are no ‘green requests’ from industry, quality of the outcome but not the processes are important” (SMK Muhammadiyah II Borobudur), however, they are planning to introduce waste disposal on their own initiative.

The lack of funds is a constraint in implementing green training. A few partnerships with the private sector initially provided solutions, but these could not be sustained due to a lack of recurring funds. Toyota installed oil recycling equipment at SMKN26 and conducted teacher
training programmes, however the equipment could not be maintained due to a lack of funds and therefore they resorted to traditional methods of working. Due to expansion of training programs and a limited space available on campus SMKN38 stopped producing compost and separate organic and non-organic waste. Greener technologies require new equipment, and SMKs report difficulties in procuring them. Another challenges in establishing green programs relates to lack of demand. SMK 2 received funds from Holland to develop teaching resources on renewable energy and open a new course. SMK conducted a survey to identify a demand for this course. First, due to people’s unfamiliarity with renewable energy issues, parents are not encouraging children to enrol in this. Second, industry placement for practicum would be very hard to organise (e.g. there is no wave energy opportunity, however, wind energy is available) and employment opportunities are very limited: “We are ready to open this new training program, population – is not” (roundtable presentation). Third, other SMKs do not offer similar programs, so there is no “reference point” for us for developing curriculum.

Box 2.6 Seeking innovative solutions to green issues

“Akademi Tehnik Mesin Industri/Academy for Manufacturing Engineering (ATMI) is adopting innovative approaches, the Solo and Cikarang campuses of ATMI encourage its own graduates and other graduates from other universities to work together to find innovative solutions for problems, including green issues. A number of innovative teams are working on issues such as solar power, renewable energy, waste treatment, and solid waste treatment. Each business incubator includes 5 people. Some new technologies for energy generation and auditing developed by incubators have been showcased in different countries. Business incubators identify problems in industry and developing solutions with the aim to turn this into a business in three years. After three years they decide whether the company should be kept running by the former students, or sold (10% of shares would be kept by the students) or the decision taken that it is not feasible to continue. They also invite consultants (e.g. recently from Austria) to contribute to technology development. In 2012 nine businesses were ready to start up.

ATMI Solo has plans to establish a green company in the Techno Park at Solo.”

Source: EdUHK Research Interview

TVET in higher education is more active in developing knowledge and skills on environment related matters. The Directorate General of Higher Education, together with the Ministry of Environment and the Ministry of Forestry, provided $50,000 for greening 30 university campuses in 2011. The MoEC provides $10,000 to fund 800 research topics related to climate change. 400 Environmental Study Centres have been established across the country to train government officials in environmental issues. Yogyakarta State University introduced training related to hybrid cars and CO₂ testing.

While the training providers integrate areas of green skills into their courses and curriculum, the actual green practices required in agriculture, industry and the service sector are quite different. The agriculture sector has connotations of “green” such as water conservation, use of fertilizers and appropriate cropping patterns. The services sector is concerned more with
conserving energy. The industry sector is interested in processes such as pollution control, recycling, waste management, procurement, and energy audits. The demand for green skills in traditional industries mostly arise out of the need to comply with regulations. Green skills demands in new industries, such as renewable energy production, arise out of the need to conserve resources and global sustainability agreements. Within the industry sector, there are different “shades of green” between the sectors that need to be considered when developing strategies. At the level of HE TVET approaches for greening varies. The Directorate General of Higher Education is well aware of the green agenda and involved in different initiative to support greening in HE. It runs awareness campaign conducting seminars across the country on how to develop students’ and teachers’ understanding of climate change issues. In 2011 the Directorate, together with the Ministry of Environment and the Ministry of Forestry, provided 50 000$ per university for greening 30 campuses.

ESD should be included in teaching, research and community development. In terms of curriculum, since 2010 an ESD module has been introduced in HE curricula with an emphasis on the environment. In addition to this general module, academic staff have an obligation to include sustainable development SD issues across different subjects. Since 2009 they introduced real world lectures that are dealing with current issues relevant to sustainable development. Two new courses on environmental engineering ready to be introduced in March 2013.

**Box 2.7 Producing graduates to promote sustainable development**

“The purpose of the Technology for Sustainable Development Master Programme, Sekolah Vokasi University of Gajah Mada (UGM), Yogyakarta programme is to produce graduates with a high level of analytical and integrative skills who are able to analyse, integrate, and optimise environmental systems in the framework of sustainable development. At the skills level, graduates are able to apply, develop and enrich the field of environmental science and technology. At the managerial level, graduates are able to synergise the interaction between components of the system in the field of environmental technologies for sustainable development. The programme consists of 45 credits and includes three components: 17 credits for Compulsory Courses on Environmental Studies, 20 credits for Compulsory Technology for Sustainable Development Courses (8 Credit Points (CP) on Technology Studies and 12 CP on environmental friendly technologies) and 8 credits for a thesis component. For successful admission students need to have science, engineering, health, or agro degrees at level S1.”

Source: EdUHK Research Interview and the programme catalogue

Sustainable development is a part of a three month community service that all students undertake in rural areas. Students from different faculties go to one village to have a thematic experience. They partner with the local government to identify community needs within 10 themes that include micro-hydroelectricity generation and domestic sanitation. The third pillar of HE is research. MoEC provides 10 000$ to fund 800 research topics that are related to climate change. 400 Environmental Study centres have been established across the country to train government officials in environmental issues.
Specific VTPs are at different levels of greening implementation. VTPs stated that health and safety subjects deal with environmental issues as well as other subjects (Politeknik Manufaktur Astar). This Polytechnic does not have a special program regarding green skills, however they pay attention to Energy conservation and took part in the National seminar on that issue. At these levels specific green skills are also targeted by VTPs. ATMI Solo includes “Energy efficiency course” in mechatronics. They claimed that general awareness has increased with the use 5S from Japan. They also observed that environmental concerns are spreading through industry practices and TVET training (ATMI Cikarang). VTPs respond to donors’ initiatives and industry requests. The Faculty of Engineering at Sekolah Vokasi UMY (Private Polytechnic and University) introduced elective subjects in the Department of mechanical engineering on energy efficiency and renewable energy (solar, wind); Energy saving houses (developed in collaboration with institutions in the Netherlands). They have bio-diesel, biogas and biomass laboratories. All these initiatives were started by the donor’s grant. The project ended in 2012 and the course on wind energy has not continued as this type of energy is not feasible in their context. This university has 5 subjects in environmental engineering as a part of the civil engineering degree.

Industry requests for CO2 testing and hybrid cars development were the reason for Yogyakarta State University to include these in their curriculum. In 2012 hybrid cars training was included, based on competencies developed by international companies such as Toyota. The importance for staff training in greening processes has also been emphasised. Yogyakarta State University is planning to buy a hybrid car prototype from Toyota, Toyota will provide professional development for teachers (then staff will work out curriculum).

1.4 Other stakeholders

The Ministry of Manpower and Transmigration stated that curriculum at training centres does not directly include green training, however, regulations in terms of health and safety (avoid child labour, do not damage the environment, minimise waste) include environmental friendly components. MoMT has 19 productivity improvement centres that promote green productivity and green entrepreneurship, and these are supported by the ILO. The ILO has a capacity building project in 8 sectors on green jobs; a pilot project on eco-tourism guides and green home stay. ASEAN eco-tourism standards are used to develop competency standards and green standards. Another pilot is related to introduction of a green training modules in 5 sectors: energy, tourism, creative industry (e.g. batik), food security and waste (MoMT and ILO interviews).

The Ministry of Youth and Sports together with the Central Bank of Indonesia support “Indonesian green entrepreneurship program” aimed at increasing level of entrepreneurship and at greening businesses (ILO interview).

National Council on Climate Change is very active in mainstreaming knowledge on climate change within different institutions. It was established in 2008 to coordinate activities across 17 ministries. NCCC has a communication strategy to mainstream knowledge and awareness of climate change. It supports capacity building through a network of 19 universities aimed at

16 5S is an approach towards organizing a shared working area at the workplaces. This approach help improve efficiency by eliminating waste, establishing work flow and improve quality standards: sorting materials, focusing on efficiency, cleaning often to ensure safety, eliminate waste and meeting the standards.
lowering emissions. It organises the Indonesian Climate Change Expo, the Annual conference for NGOs and Universities “Indonesian Carbon update”, Youth camps, Forum on Industry green investment and innovation products. NCCC publish Green Investment Outlook and produce movies for senior high schools on low emission developments.

However, the Ministry of National Development Planning (BAPPENAS) stated that they “do not have experience on how to include green growth training”. Although they started to link climate change and education two years ago, “it is still a concept”. Development agencies such as ILO and GIZ collaborate with the government on green jobs, there is still. “No curriculum for education and training, no modules related to green jobs” (interview).

There is a need to mainstream greening and green training into all reforms. BAPPENAS oversees development of mid-term development plans. The 2014-2019 plan has 3 pillars: economic connectivity; HRD; and Science and Technology. HRD is a focus of the MoEC working group on skills development that provides an opportunity to include greening.

2 Overall findings: Key issues from the business sector and from TVET providers

2.1 Introduction

This study attempts to explore important questions such as the most effective ways in which governments, businesses, NGOs, private sector and members of civil society can operate in a coordinated way, and move in the same direction, when it comes to the greening of the economy and providing training for green skills. It also seeks to identify ways to get small and medium enterprises to change their existing practices to attract and be involved in the greening of their production and distribution processes.

There need to be “carrots” (financial and other incentives) and “sticks” (regulation and economic instruments) to get businesses to change their behaviour. What are the best and most effective ways to translate policies into practices, especially with regard to the unorganized sector and informal employment, and how can TVET providers throughout the country update their programmes to be more relevant to meeting modern economic needs including developing green skills for green jobs?

In order to respond to these types of questions, the study took the approach of capturing voices from all stakeholders, which included industry, TVET training providers, government, NGOs/development agencies, and dovetailed these with the emerging problems, existing policies and practices to explore answers to the above questions from all perspectives, not just from a national policy viewpoint. The main sectors covered in the survey were manufacturing, hospitality, construction, energy and transport. While the response rate from some sectors was good, the responses to the survey by the energy and transport sectors were low, and hence drawing conclusions concerning these sectors from the limited sample must be treated with caution.

The ADB-EdUHK survey and interviews of industry representatives indicate that the term green job is not readily or widely understood. Instead the idea of green skills was volunteered by some of interviewees and appears to be more readily accepted and understood. This was due, in part, to employers seeing all employees as green workers.

Interviews with employers suggested that there were green skills needed by all workers in order to ensure that enterprises successfully and consistency implement green work practices. At the
same time, industry also voiced helplessness in accessing green skilled manpower from TVET institutions due to the inadequate capacity of such institutes to deliver on what is required. TVET institutions, on the other hand, spoke about low industry demand for green skills.

**Box 2.8 Does industry want green skills?**

| “Industry does not see the need for green skills. Nor do they demand green education inclusion…..” |
| Source: EdUHK Research Interview. A non-government organisations skills provider response |

Overall, company representatives did not identify any specific changes in the technical skills required of their workforce to work more sustainably. However there was evidence that some jobs now need more hybrid skills than before. When asked directly about new skills required by their workers to support the company to become sustainable or to maintain sustainability targets, interviewees mainly identified non-technical skills along with new technical knowledge.

In addition, companies that have strong international linkages tend to appreciate green or sustainable practices, and possess international and national environmental accreditations of one kind or another. There is awareness about green awards and considerable significance is given to customer demands and compliance across supply chains. The ADB-EdUHK survey also establishes a high degree of value being placed on suppliers having skilled workers.

The ADB-EdUHK industry survey and the interviews suggest that generic green skills such as environmental awareness, energy and water efficiency, waste reduction, waste management, auditing, assessment, green procurement; understanding of standards and legislation and the ability to implement them are all crucial, in every industry and at every job level, to achieve and sustain green growth.

2.2 **Key issues from the business sector**

**Demand for green skills/jobs**

More than 50% respondents in the construction sector, 30% of the manufacturing sector and over 40% of hospitality sector respondents agreed that there is a lack of skilled employees to respond to climate change issues. However, less than 30% of respondents in all sectors needed to employ new workers or train existing workers in green skills. While over 60% of construction sector respondents believe that climate change issues are opening up new markets for them, the same is not experienced in the hospitality or manufacturing sectors (Figure 2.9). A growing demand for green buildings, changing processes in brick making; steel making and efficient use of energy in construction may be triggering new markets for industry. Rising regulatory compliance requirements in the manufacturing and construction sectors are also having an impact on the growing importance amongst senior management regarding environmentally related jobs. More than 55% of manufacturing and 45% of construction respondents agree to this fact.

While almost all energy sector respondents agreed that they had hired or trained new workers in green skills, transportation sector respondents were of the opposite view considering that there was no need for green skills. This may be due to the informal nature of the transport sector
but the response rate is too low to make a firm conclusion. Fifty percent of energy sector respondents have a lack of climate change related jobs and this has meant higher workloads for other workers in 75% of the survey respondents. Furthermore, 75% of energy survey respondents have indicated that they are not working as well due to this shortage. An equal number of energy respondents also place a high priority on up-skilling their workforce.

**Figure 2.9** Comparison of the five sectors’ requirement to employ, train or integrate green skills in their workforce

![Comparison of the five sectors’ requirement to employ, train or integrate green skills in their workforce](image)

Note: Data for Energy and Transportation sectors must be treated with caution due to the relatively low response rate

*Environmental impact assessment and green skills development*

Over 60% of hospitality sector respondents give high importance to the need for impact assessments in order to become environmentally friendly (Figure 2.10). While this is also acknowledged by the manufacturing and construction sector, the requirement to comply with international standards and to meet consumer demands seem to be the most important drivers
for the hospitality/tourism sector. As companies start developing tourism activities close to national parks, impact assessments play a central role in product development. Furthermore, collaborating with local communities features strongly in sustainable ecotourism (Chan and Bhatta, 2013) as locals become guides and provide local produce. Pulp and paper manufacturers (part of the manufacturing sector) identified impact assessments as an important influence in changing their work practices. They have employed consultants to work with them across the areas of CSR and impact assessments and to monitor behavioural changes taken from the workplace into the local community and amongst the families of workers. Energy sector respondents place high importance on impact assessments, while the transport sector responded that this is of medium importance to their work practices. This may be because there is a high awareness of environmental issues in the energy sector.

**Figure 2.10 Comparison across five sectors on the importance of undertaking impact assessments related to environmental issues**

![Bar chart showing the comparison across five sectors on the importance of undertaking impact assessments related to environmental issues.]

**Box 2.9 Promoting sustainable production**

“Kadin Indonesia (Indonesian Chamber of Commerce) has been committed to implement the concept of sustainable production since 1992, since then, we have recruited over 200 major companies from over 65 countries to fully commit to the concept of sustainable development.”

Source: EdUHK Research Interview, Deputy of Permanent Committee for Management of Environmental Impact / Secretary General, Indonesian Chamber of Commerce/Indonesia Business Council for Sustainable Development (IBCSD)

**Effects of Government initiatives**

Employers place high importance on government initiatives influencing the policies developed by business (Figure 2.11). Of the four areas of policy that were questioned, green jobs were seen to have the least influence in all sectors. Skill development in the manufacturing sector was regarded as being highly influenced by policies and may be due to rapid changes in manufacturing processes and the subsequent need for skills development.
Figure 2.11  Companies who were influenced by government policy initiatives

<table>
<thead>
<tr>
<th>Sector</th>
<th>Economic Development</th>
<th>Environmental Policies</th>
<th>Skills Development</th>
<th>Green Jobs</th>
</tr>
</thead>
<tbody>
<tr>
<td>Construction</td>
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<tr>
<td>Hospitality</td>
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<tr>
<td>Manufacturing</td>
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<tr>
<td>Transportation</td>
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<tr>
<td>Energy</td>
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</table>

Key issues that have affected businesses

Government legislation and industry standards have affected the construction sector the most. Nearly 80% of construction sector respondents agree that green building laws, and improving energy efficiency, have affected their business in the past year. CSR issues seem to have affected manufacturing industry the most (65%). In all the three sectors less than 50% of respondents agree that the rising costs are of concern, which is contrary to the findings in other countries (Figure 2.12). The construction sector reports a high demand for ‘green skills’ in workers mainly because of the understanding needed in constructing buildings in an environmentally sustainable way. The hospitality sector seems to be least affected by any of these factors, however increasing costs have affected this sector the most. This may be due to a highly competitive tourism market and rising consumer demands for green products.

Seventy five percent of energy sector companies, and 50% of the transport sector, are affected by the government legislation. Fifty percent of the energy and transport sectors are affected by industry standards. Rising costs have affected 100% of transport companies and 50% of energy companies surveyed.
Sustainable practices introduced

Less than 30% of businesses surveyed are using sustainable practices such as energy efficient products and services, and recycling, in their work practices (Figure 2.13). A larger number of respondents were negative about using any such practices (35% in construction, 63% in hospitality and 40% in manufacturing). The response is counterintuitive as many of the respondents earlier expressed a progressive and environmentally friendly outlook. This is clearly a case where individuals may be aware and enthusiastic about green issues, but do not really know how to institutionalize practices in the workplace. The “do not know” response of 15-20% of respondents in the construction and manufacturing sectors indicates the need for a mass communication effort to sensitize producers as well as consumers on green jobs and green skills. Even though there are businesses that agree to use sustainable practices, the survey could not assess the extent of such practices or the quality of recycling, materials and related matters.

Twenty five percent of energy sector respondents and 50% of transport sector respondents agreed that they had introduced energy efficient services, while 50% of the energy and transport respondents agreed that they were involved in the recycling of old products.
Figure 2.13  Use of energy efficient materials, services, processes, and recycling in the businesses

Interest in sustainability of the supply chain

Nearly 80% of construction sector respondents considered it important that their supply chain has sustainable infrastructure, while in comparison the figure was almost half of this (44%) in the hospitality sector (Figure 2.14). The generally positive response in all sectors indicates interest and understanding of sustainability in the supply chain, however, it cannot be concluded from these responses that this equates to action, such as changing or avoiding suppliers without sustainable infrastructure. Seventy five percent of energy sector respondents expect their supply chains to have green products and services and sustainable infrastructure while none in transport have an interest in the sustainable infrastructure of the supply chain.

Figure 2.14  Requirement of companies in the supply chain to have sustainable infrastructure

New green jobs

Less than 30% of respondents in all sectors agree to be employing new workers or training workers for green jobs (Figure 2.15). Quite a few respondents in the construction and the
hospitality sectors were ‘not sure’ reiterating the lack of clarity in terms of understanding and defining green jobs.

Figure 2.15  Percentage share of industry sectors employing new workers, or training workers in green jobs

<table>
<thead>
<tr>
<th>Sector</th>
<th>Yes</th>
<th>No</th>
<th>Not Sure</th>
</tr>
</thead>
<tbody>
<tr>
<td>Construction</td>
<td></td>
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<tr>
<td>Hospitality</td>
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<td>Manufacturing</td>
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Engagement between industry and training providers

One of the key pillars of meeting the needs of industry is a TVET system which should be closely aligned and responsive to the emerging demands of industry. The ADB-EdUHK survey (Figure 2.16) indicates that more than 70% of businesses agree on the importance of TVET work based training for potential employees, however when the linkages and the subsequent involvement of the industry with the TVET institutions are studied, the level of engagement is not encouraging. Only 10-11% of businesses report active engagement with training institutions in the construction and hospitality sectors, and a slightly higher number (18%) in the manufacturing sector. Less than 40% of industry respondents are satisfied with the output of TVET institutions, indicating that a significant bridge is needed between industry requirements and TVET supply. A McKinsey global research report (see Mourshed, Farrell and Barton, 2012) also suggested that there were disconnections between employers and training institutions, mainly due to the lack of communication between them.

While 100% of the energy companies consider TVET important to very important for supporting environmentally friendly operations, only 50% of companies said that they have a lack of jobs in this area. Seventy five percent found universities to be good at responding to their skill development needs.

Similarly, 50% of transport respondents found vocational training centres and universities to be satisfactory in meeting their skills needs. All transport survey respondents identified TVET training for employees as important. The bus company interviewed is involved in providing workplace training for the local private vendor and government TVET institutions. They regularly take third year students for work experience and every month receive a batch of 5 to 10 students. These students are introduced to energy and water efficiency through observing and participating in company procedures.

Furthermore, 50% of energy companies have frequent contact with TVET institutions. All transport and energy companies consider workplace training to be very important. All energy
companies also rated TVET training of staff as important to their sustainability practices. Interviewees at Indonesia’s main electricity company informed the EdUHK researchers that they have their own training centres, and some of these have MoUs with the Electrical Industry Training Institute from Canada and the University of Gajah Mada (UGM) for specialist skills and knowledge.

**Figure 2.16 Industry and TVET linkages**

![Industry and TVET linkages](image)

**2.3 Key issues from TVET providers**

*TVET providers’ views on skills development*

Over 80% of TVET providers both at the school and higher education levels believe that economic development has greatly influenced the development of their programmes. However they have not added new programmes or courses for the same, but tweaked existing programmes to reflect changes from lower skills levels to middle skills levels and from middle to higher skills levels (Figure 2.17). The secondary school level, 78% of respondents, and in higher education over 90% of respondents, considered that they had shifted from low/middle level skills to higher level skills.
Figure 2.17  TVET providers’ views on skills development (1)

- Over the last 3 years economic development has influenced development of our programmes
- We have offered new courses/programmes and closed others over the last 2 years
- Recent programme changes reflect shifts from low skills (labour intensive) to middle level skills jobs
- Recent programme changes reflect shifts from low and mid level skills jobs to high skills knowledge based jobs
Box 2.10 TVET providers to promote green skills

“PT Balai Latihan Pendidikan Teknik/Technical Education and Training Centre (BLPT) Yogyakarta was established in 1981 and is associated with the provincial government with the purpose of increasing the quality of SMK graduates to make them competitive at national and international levels.

BLPT offers different courses for 1 month, 3 months and 3 years in electrical, automotive, industrial machining, electronics, automatics and furniture. They also run short courses for the general public and university students and provide space for practice to SMKs’ students that do not have facilities.

Through production based education BLPT produces parts for industry and sells them for income generation for about $200,000 per year. During their production processes they ‘take care of the environment through managing waste (recycling, e.g. metal and using for further production). The Centre has eight industry partners including a tractor manufacturing factory and car parts production factory. The Centre is also actively involved in research. They have developed a model of an electric tricycle and have already received orders from the Ministry of Public Works for use of the tricycle by staff in Jakarta. Twelve tricycles were produced by February 2012. Eighty percent of parts are manufactured at BLPT. The tricycles can run for 4-6 hours without charging (around 50 km) with a speed of 25km/hour. In March 2012 the Centre started production of mobile rice millers (all parts except the engine).

All student at the end of long-term courses need to take part in National Competency Standards exams developed by the National Professional Certification Body. The Centre sends its instructors for training to the Vocational Education Development Centre for professional development and for benchmarking with other centres and schools.”

Source: EdUHK Research Interview

However, the change in training standards is guided more by the change in specific occupations than occupational standards used in the industry. Also the training providers feel satisfied about being able to meet the local/regional skill requirements than national level industry wide requirements (Figure 2.18).
TVET providers’ views on the greening of the economy

TVET providers realise the importance of adjusting training needs in response to the greening of the economy (94% at school level and 100% at higher education level) and equivocally agree on the need to start new training programmes to meet the demand for green skills. Only 68%
and 77% had introduced new courses and programmes to train students in “green skills” (Figure 2.20). The poor implementation, despite high aspirations, may be because of the institutions’ own policies not being very effective in developing green skills. Only 63% and 33% expressed confidence in their policies (Figure 2.21). The dependence on external collaboration is high in order to include green skills programmes and courses.

**Figure 2.20** TVET providers’ actions in response to the greening of the economy (1)

Additional skills and competencies have been added into existing courses to meet green skills requirements (more than 60% of respondents agree). They are introduced these through both general and specialised subjects, and through industry placement (suggesting that industry is using green technologies). There is a difference, however, between Higher Education Vocational Training Provider (HE-VTPs’) and SMKs’ perceptions regarding effectiveness of their training for meeting greening demands from industry. A majority of HE-VTPs believe that they are not preparing students well; however, 60% of SMKs believe that their green training is meeting industry requests. These results may suggest that there is scope for green
skills at the level of high skills that are currently not met by HE-VTPs. At the level of low and middle skills the response is better.

**Green content in TVET programmes**

‘Green content at the secondary school level is mainly learnt through general subjects’ (78% were in agreement) while at the higher education levels, it is mainly learnt through industry placements (73% agreement) (Figure 2.22). In both the types of institutions, nearly ~53% agree that green content is learnt through specialised subjects. A more detailed analysis of the course content may be required because this response does not agree with the earlier response that they have not added any new programmes or courses in the last two years.

Students are involved in extra-curricular activities to raise their awareness and develop positive attitudes towards the environment. Green campus activities are common for both types of providers. Although all providers understand the importance of up-skilling teachers and instructors to meet the needs of a greening economy, they have not fully acted on that understanding.

**Figure 2.22** TVET institution needs to develop a full approach to adjust training to the needs of a greening economy

<table>
<thead>
<tr>
<th></th>
<th>Vocational School</th>
<th>Higher Education</th>
</tr>
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<tbody>
<tr>
<td>In this institution ‘Green’ content is mainly learnt in ‘general’ subjects</td>
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</tr>
<tr>
<td>In this institution ‘Green’ content is mainly learnt in specialised subjects</td>
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<tr>
<td>Green content is mainly learnt through industry placement during the courses of the institution</td>
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**Accreditation and certification**

Almost 72% of training providers at the school level and 27% of training providers at the higher education level agree they have developed “green” skills standards. Fewer agreed they have developed certification systems (Figure 2.23). This is again a little counterintuitive, as based on other questions; since the concept of green skills seems to be nascent in the training and education systems. It would be worthwhile to investigate further the basis on which training providers are suggesting they have developed green standards and certification. It is also possible that respondents are referring to standards set-up by the National Education Standards Agency (abbreviated BSNP, *Badan Standar Nasional Pendidikan*).
Figure 2.23 Comprehensive “green” skill standards have been developed in TVET institutions

Higher education institutions are accredited by the National Accreditation Body for Higher Education Institutions (BAN-PT) while private training centres need to be accredited by the National Accreditation Agency for Informal Educational Units (Badan Akreditasi Nasional Pendidikan Non-formal, or BAN-PNF). According to the World Bank report (2011), in 2005 there were 25,000 private training centres that reached 4.5 million students, compared to 50,000 students reached by public centres.

Box 2.11 TVET providers to promote green skills

“Jember State Polytechnic offers a four year bachelor programme in applied science concentrating on bio fuel, biomass, micro hydro, solar cell and wind energy. The last semester of the total eight semesters is allocated to apprenticeships in renewable energy companies. Developed a micro-hydro power generator for residents of the Sub-district of Patrang and District of Jember, East Java.”

Source: EdUHK Research Interview

Teacher and trainer skills

More than 60% of the training providers give high importance to the need for up-skilling teachers and trainers in the vocational education system (Figure 2.24). The close linkage between higher education institutions and vocational training is encouraging (a lot of vocational training being provided by higher education institutions) and logical because many of the faculty in the vocational training schools come from higher education institutions.
Priority institutions give to up-skilling teachers and trainers to meet the needs of a greening economy (1-10 scale of importance)

Professional development of teachers is organized by the Directorate General of Vocational Education (MoEC) through Pusat Pengembangan dan Pemberdayaan Pendidik dan Tenaga Kependidikan (P4TK - Centre for Development and Empowerment of Teachers and Education Personnel) that invites teachers to take part in training (e.g. from vocational school SMKN38 one teacher takes part in training every year). All Centres have a regular budget from the MoEC for training. In addition they receive some funds from the districts and provinces to provide training based on local requests. Centres themselves undertake training needs analysis, however, if teachers are not registered, “it is difficult to reach them” (Interview, P4TK).

In addition to training programmes organized through P4TK Centres, SMK’s teachers take part in programmes organized by universities, subject teachers associations, and initiatives by donor organisations. For example, the US Embassy organizes English courses and seminars on entrepreneurship; German Federal Enterprise for International Cooperation (GIZ) runs long-term training courses to teach educational methods for young TVET managers. Professional development training is offered by industry, where teachers can learn directly from industry experts. For example, industry provides training for all teachers of SMKN29 at the Garuda Maintenance facility and after recruitment, industry representatives come to the SMK to provide feedback. At the universities teachers are enrolled in Masters and PhD programmes supported by the government and universities’ own resources (e.g. Yogyakarta State University, teacher training programmes in Thailand, USA).

The results of the survey indicate that a variety of methods are used by VTPs for teacher training such as individual mentoring by more experienced teachers, small group meetings/discussions at the institute, and industry organized training courses for teachers at the industry site.
## Box 2.12 Summary of key findings

<table>
<thead>
<tr>
<th>Findings</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>Less than 30% of respondents in all sectors agree they are employing new workers or training workers for green jobs.</td>
<td></td>
</tr>
<tr>
<td>Over 60% of hospitality sector respondents place high importance on environmental impact assessments in order to become environment friendly.</td>
<td></td>
</tr>
<tr>
<td>The construction industry is most influenced by economic development and environmental policies of the Government. Skill development policies are influencing the manufacturing sector, with more than 65% of the businesses surveyed agreeing they have been influenced by green job policies.</td>
<td></td>
</tr>
<tr>
<td>Nearly 80% of construction sector respondents agree that the green building laws and improvements in energy efficiency have affected their business over the past year. While the manufacturing industry is most affected by CSR issues (65%).</td>
<td></td>
</tr>
<tr>
<td>Less than 30% of businesses are using sustainable practices such as energy efficient products and services, and recycling, in their work practices.</td>
<td></td>
</tr>
<tr>
<td>Seventy percent of businesses agree on the importance of TVET work based training of potential employees. However, only 10-11% in the construction and hospitality sectors, and 18% in the manufacturing sector, report active engagement with training institutions.</td>
<td></td>
</tr>
<tr>
<td>Over 80% of TVET providers, both at the school and higher education levels, believe that economic development has greatly influenced the development of their programmes.</td>
<td></td>
</tr>
<tr>
<td>Sixty percent of respondents at the higher education level and 80% at the secondary education TVET believe that their institution is adequately involved with the industry.</td>
<td></td>
</tr>
<tr>
<td>Green content at the secondary school level is mainly learnt through general subjects (78%) while at the higher education levels, it is mainly learnt through industry placements (73%).</td>
<td></td>
</tr>
<tr>
<td>More than 60% of training providers give high importance to the need of up-skilling teachers and trainers in the vocational education system.</td>
<td></td>
</tr>
</tbody>
</table>

Source: EdUHK Team Analysis
3 Sector wide findings - emerging green skills and job requirements

3.1 The construction sector

The Indonesian construction industry was badly affected by the recent economic downturn. However, the sector has been growing in recent times but, according to a McKinsey report (Oberman, 2012), the sector will find it difficult to fill 40 to 50% of positions requiring tertiary qualifications. At the same time the report predicts an oversupply of TVET graduates working in the sector based on business-as-usual projections. Construction is a cross cutting sector which has an impact on a number of areas relevant to sustainable development, such as in the waste management area with the development of sewage systems to transport waste, or the development of green airports. The McKinsey report (Oberman, 2012) identifies a lack of skilled workers generally and, in particular, workers with green skills in the construction industry as one of the priorities for tackling barriers to economic growth.

To assist in the promotion of a greener built environment, the Green Building Council of Indonesia has created a ‘Greenship’ certification which uses a rating system that is based along the lines of other green building rating systems around the world. Greenship is divided into six elements:

- appropriate land use;
- energy efficiency and refrigerants;
- conservation of water;
- source and cycle materials;
- air quality; and
- environmentally friendly building management.

This has created the necessity for new skills across a broad spectrum of the workforce including craftspeople, designers, engineers and project managers.

More than 50% of the respondents surveyed believe their costs are higher than they should be due to a lack of workers with green skills (Figure 2.25). During the interviews, company representatives discussed poor skills and an inappropriate use of construction materials as the main reasons for wastage. Not being able to meet sustainability targets is another consequence of the businesses not being able to work as efficiently as they could be. However, interviewees indicated that the training of frontline project managers in green construction techniques and green certification through the Green Building Centre has assisted in reducing inefficiencies. It was indicated that there is an increasing, (though low level) awareness amongst their government and residential clients and a corresponding increase in demand for green buildings. This may partly explain the 27% response where participants cannot expand their business.
Figure 2.25 Effect of a lack of skilled workers on environmentally related jobs in the construction sector

None of the survey respondents see a change in the technology or materials they are using as a result of greener business practices (Figure 2.26). This suggests either that there is low involvement in sustainable business activities, or else that architects and engineers are not incorporating new products and materials into their designs. According to the World Green Building Trends Smart Market Report, Architects and Engineers are the fastest to embrace new products, technologies and materials and are earlier adopters of green strategies. However, contractors and owners have a lower level of take up of green products and services. The interviews were conducted with large construction companies and their feedback supports the trend identified in the World Green Building report.

Nearly 55% of surveyed businesses indicate that they have experienced job changes due to greening of their business (Figure 2.26) suggesting that the move to sustainable business practices has commenced. With the government incorporating green components in projects, interviewees reflected that this has led to businesses undertaking green certification training. There is also a strong push for them to be more green in their international markets than in the domestic market.
Nearly 73% of businesses in the construction sector identify the introduction of new standards related to sustainability or environmental issues as leading to new skills for the firms involved (Figure 2.27). Government legislation and social demand were identified by 64% of respondents as influencing the requirement for new green skills in their company. The interviews indicated that inclusion of green requirements in government tenders and domestic demand are the key drivers influencing the design and incorporation of green building features. Fifty five percent of businesses identified impact assessments as creating a demand for green skills. The need to undertake environmental impact assessments has created the demand for skills in impact assessment, community consultations and an understanding of design and engineering.

Figure 2.27  Influences creating a demand for new skills in the construction sector
In addition, 55% of respondents report that import or export requirements have resulted in a demand for new skills. Interview participants commented that this is particularly so when working with international clients who require green designs and the installation of green products. Corporate Social Responsibility focussed on green projects is another area that 55% of the firms have identified as creating new green skills within the company. During the interviews, a large construction company informed the EdUHK researchers that they provide a supervisor and management training for their supply chain, which includes green content and they also invite government representatives to discuss new green legislation. Suppliers also come and talk about their green products. The courses also cover procurement, safety and other topics as required.

Nearly 82% of respondents consider the TVET training of employees as important to very important for the company to become sustainable (Figure 2.28). One of the big issues raised was the need to optimize material usage which reduces wastage and hence costs. Craftspeople and semi-skilled workers need training in the correct use and application of materials.

Figure 2.28 Issues considered important for becoming environment friendly in the construction sector

Understanding of environmental awareness is considered important by 64% of the respondent businesses. Interviewees commented that it is very difficult to get workers to worry about site run off or recycling and reuse if they think it is only about saving the company money. Collaboration is rated as important to very important by 55% of survey respondents in relation to mainly working with contractors and local community groups (Figure 2.28).

The Indonesian construction industry is heavily dependent on imported steel which is estimated to account for 90% of all imported steel by 2030 (Oberman, 2012). Industry and government are keenly aware of the need to increase steel efficiency, creating an interest in developing innovative construction materials and building techniques. Fifty five percent of respondents identify innovation in technology as important to very important, and interviewees expect that more electrical and mechanical products and waste management systems will be required in
future, creating a need for craftspeople to up-skill in working with new products and technologies.

Like many other industries, greening the supply chain is part of a construction company’s green strategy. The World Green Building Trends Smart Market Report found that 75% of respondent construction companies worldwide require their supply chain to introduce green or sustainable practices. Seventy percent of construction sector respondents in this study consider it important that their supply chain partners use energy efficient measures (Figure 2.29). While 60% view the use of sustainable infrastructure as important, suggesting that green and sustainable practices are pushed down the supply chain as much as possible by larger organisations (most of the construction sector respondents were large organisations). Nearly 50% require their suppliers to use green products or services, which is particularly important for architects and engineers who can specify the use of green products and services during the design phase. Interviewees felt that there is a lack of knowledge about green products and services amongst architects and engineers, particularly the cost of these in comparison to traditional products and services.

**Figure 2.29 Requirements from downstream supply chain businesses in the construction sector**

Key changes in skill profiles based on demand from the construction industry include high level and medium level skills for project managers in green construction techniques and green certification. Architects and engineers require greater knowledge of green products and services so they can specify the use of these in the design phase; and they need skills to be able to undertake cost comparisons between traditional products and services and their green equivalent. Architects and engineers also require a greater understanding of design and engineering options to reduce the environmental impact of a development on the local environment. Design skills and knowledge in thermal control, in areas such as the arrangement and selection of suitable vegetation and designing a natural flowing air circulation, are important.

Changes to skill profiles at the medium level include skills in impact assessment and community consultations. New skills are required to be developed in innovative construction materials and building techniques. In addition, changes to skill profiles for craftspeople and semi-skilled workers require training in the correct use and application of materials and preventing site run off. They also require top up skills in electrical and mechanical products
and wastage management systems. Craftspeople require knowledge and skills in installing and retrofitting new green products and technologies.

### 3.2 The energy sector

Indonesia has a variety of energy sources, including crude oil, natural gas, coal, and an abundance of renewable energy sources, such as geothermal and hydro power. According to the 2010-2014 National Medium Term Development Plan, energy security and diversity can be facilitated through increased efficiency in consumption, energy savings measures at a household level, as well as in industry, and in the transportation sector, and by producing clean and economical energy. (BAPPENAS, 2010)

In 2012 Indonesia was ranked fifth largest producer of biodiesel (palm oil), behind the United States (US), Argentina, Germany/ Brazil, and France, and has the third greatest capacity for geothermal power generation behind the United States and the Philippines (REN21’s, 2013). Indonesia currently receives 16% of its electricity from renewal energy sources and has increased its renewable electricity target to 26% by 2025 (Yep, 2012), while the consumption levels of biomass and renewable energy is 29% (Figure 2.30). In addition, Indonesia introduced a new Feed In Tariff (FIT)\(^{17}\) for biomass, and substantially increased FIT rates for geothermal power, and the Renewables Global Status Report suggests that wind and solar FITs will soon be introduced. At the same time, the government had initiated reductions in fossil fuel subsidies.

#### Figure 2.30 Indonesia total primary energy consumption, 2011

![Chart showing energy consumption by source in Indonesia in 2011]


Seventy five percent of energy respondents surveyed identified that workloads were higher than they should be and the company was not working as well as it could be due to a lack of

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\(^{17}\) FITs are a policy mechanism designed to accelerate investment in renewable energy pointing to the government’s interest in diversifying energy sources.
skilled workers (Figure 2.31). Fifty percent of respondents find it difficult to: meet their sustainability targets, maintain their equipment and have higher costs due to a lack of staff in environmentally related green jobs. Overall, the energy companies are experiencing difficulties due to a lack of skilled workers.

**Figure 2.31  Effect of a lack of skilled workers on environmentally related jobs in the energy sector**

<table>
<thead>
<tr>
<th>Issue</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Not able to expand our business</td>
<td>25%</td>
</tr>
<tr>
<td>Not working as efficiently as we could</td>
<td>75%</td>
</tr>
<tr>
<td>Costs are higher than they should be</td>
<td>50%</td>
</tr>
<tr>
<td>Higher workloads for existing workers</td>
<td>75%</td>
</tr>
<tr>
<td>Having problems maintaining equipment</td>
<td>50%</td>
</tr>
<tr>
<td>Cannot meet sustainability target goals</td>
<td>50%</td>
</tr>
</tbody>
</table>

Fifty percent of energy companies indicated that changes to job roles had occurred due to the greening of their organisation, while 25% reported changes to enterprise processes and procedures (Figure 2.32).

**Figure 2.32  Key changes related to the greening of businesses in the energy sector**

<table>
<thead>
<tr>
<th>Change</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Job changes (including knowledge and basic skills, specialised and technical skills, attitudes etc)</td>
<td>50%</td>
</tr>
<tr>
<td>Changes of enterprise systems (processes and procedures)</td>
<td>25%</td>
</tr>
<tr>
<td>Changes in work systems (including people, technology, infrastructure, work envt., materials)</td>
<td>0%</td>
</tr>
<tr>
<td>Changes in value chain requirements and processes</td>
<td>0%</td>
</tr>
</tbody>
</table>

One hundred percent of respondents indicated that social demand related to environmental issues had resulted in the need for new skills (Figure 2.33). From the interviews it is apparent that as local communities become more aware of how different medium and large scale energy projects impact on their wellbeing, companies are adapting and taking on consultative roles. This results in staff needing to develop stakeholder management skills. Interviewees also mentioned that many of the local stakeholder groups had a low understanding of benefits to the environment of new technologies and so they were also developing skills in conveying complex information in simplified manageable chunks of information.
Government legislation related to climate change has prompted a requirement for new skills in 100% of energy respondents (Figure 2.33). During the interviews energy representatives identified that performance rating programmes such as PROPER were resulting in new skill demands. PROPER aims to improve environmental compliance by companies, especially compliance with water pollution control regulations, air pollution control, hazardous waste management, marine pollution control and environmental impact assessments. Environmental performance ratings are disseminated to stakeholders at the national level and stakeholders are urged to actively encourage companies to improve the environmental impact caused by their activities. This, along with the PROPER Awards and colour rating, act as a reputation incentive for companies to improve their rating. Companies that receive a black rating twice and do not show any significant progress in environmental management will be followed up with law enforcement.

Interviews confirmed that businesses were lacking skills in assessment of their business performance against the PROPER criteria. These companies bring in external people to provide environmental awareness training for staff. It was mentioned that this could be done in-house if they had training and facilitation skills. Related to social responsibility, 50% of respondents identified customer expectations as leading to new skill demands in the company. During interviews companies discussed how workers stay with the company and stay with the equipment they are trained to use, meaning the demand for new training is low. However, due to increased industry demands and government targets to improve the supply of power across Indonesia, energy companies are planning to increase refinery output and plant capacity, and the increased number of generators would require a larger skilled workforce. These new and additional skills would mainly be developed through vendors. Additionally, many of the skills identified in this study, as being generic green skills, were so mentioned, particularly by those aligned with PROPER such as water and waste management, assessment, understanding legislation and standards and stakeholder management.
Box 2.13 Promoting green transport

“All the respondent companies rated TVET training of staff as important to their sustainability practices (Figure 2.34). During the interviews Indonesia’s main electricity company commented that they have their own training centres and some of these have MoUs with the Electrical Industry Training Institute from Canada and the University of Gajah Mada (UGM). When asked if these institutes were delivering the necessary green skills, the interviewee felt that they had not yet started. When interviewees were asked if local training institutions were delivering green skills, one thought they were and the other thought they did not.

All the companies rated innovation as important for enterprise sustainability practices (Figure 2.34). Most interviewees pointed out that there is relatively low spending on research and development, and limited interaction between academia/research institutions and industry. All the respondents identify collaboration as very important and from the interviews this relates mainly to stakeholder engagement and working with members of the value chain. Environmental awareness raising was also rated as very important by all energy industry respondents. Raising environmental awareness was considered as being valuable for ensuring workers maintain sustainable work practices and so that senior managers implement green business practices.

Figure 2.34 Issues considered important for becoming environment friendly in the energy sector

“Bimo Transport Indonesia, Yogyakarta (Bimo) won two foreign convention contracts after it bought buses that meet the European Emission standards. The decision to buy the buses was the company’s own initiative and not based on a government requirement. The new customer based was not anticipated nor were they a factor influencing the initial purchase decision. However, this decision has provided the company with an unexpected competitive advantage.”

Source: EdUHK Research Interview
Similar to other industry sectors, energy survey respondents expect their supply chains to have sustainable business practices (Figure 2.35). Seventy five percent of respondent companies expect their supply chains to have green products and services, sustainable infrastructure and to have sustainable consumption and production processes. Fifty percent of respondents require their supply chain partners to have recycling processes of some kind suggesting that small and medium businesses face a high demand to implement sustainable work practices.

**Figure 2.35 Requirements from downstream supply chain businesses in the energy sector**

<table>
<thead>
<tr>
<th>Requirement</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Energy efficiency</td>
<td>25%</td>
</tr>
<tr>
<td>Recycling</td>
<td>50%</td>
</tr>
<tr>
<td>Sustainable consumption and production processes</td>
<td>75%</td>
</tr>
<tr>
<td>Sustainable infrastructure</td>
<td>75%</td>
</tr>
<tr>
<td>Green products or services</td>
<td>75%</td>
</tr>
</tbody>
</table>

Key changes in higher level skill profiles based on a demand by energy companies involved in this study include: stakeholder management skills; skills in conveying complex information in simplified manageable chunks of information; understanding hazardous waste regulations, especially compliance with water pollution control regulations, and air pollution control; skills to assess business performance against the PROPER criteria; laboratory skills to monitor water and air quality; water and waste management, and collaboration. Changes in lower level skills profiles include; top up skills in using vendor equipment, waste management, top up skills in installing energy saving and alternative energy devices.

### 3.3 The transport sector

Transport is a major source of greenhouse gas (GHG) emissions in Indonesia. The value for CO₂ emissions from gaseous fuel consumption in Indonesia was 58,338 KT in 2009 (Indexmudi, 2014). It contributed to 12.91% of total CO₂ emissions in the country. The transportation sector uses the largest share of oil consumption at 51% (Susantono., 2012).

Indonesia has incorporated intercity transport in the Master Plan on Acceleration and Expansion of Indonesia Economic Development. The Master Plan consists of 3 main pillars with the second having a major focus on transport:

- development of Indonesia economic corridors;
- strengthening domestic connectivity; and
- acceleration of reliable ICT development.
Based on a study by the (ADB 2006), vehicle numbers in Indonesia are predicted to double between 2010 and 2035, with growth expected to be largest in two wheelers and light cars. Local air quality has degraded, to the extent that 60 to 80% of air pollutants in metropolitan cities are thought to be caused by transportation (GIZ, 2012). In 2011 15.7 billion tons of freight were transported, and there were 6.9 billion person trips, with road transport the predominant mode, accounting for about 70% of freight ton-km and 82% of passenger kilometres (Susantono., 2012). The second highest transport mode is sea transport at 7%, aviation is 3% and rail is 1% (Susantono., 2012). To counter the domination of road transport the government is commencing several railway projects around the country along with marine highways. In total there are 92 ports and waterway projects, 14 airport and 25 railway projects planned (Susantono., 2012).

A regulation on tax exemptions for the production of low-cost, green cars formally known as the “Production Development of Four Wheel Vehicles for Energy Saving and Affordable Prices” under the low carbon emissions program (LCEP), provides luxury tax relief for companies producing qualified green cars. The program intends to increase transportation availability in rural areas. Under the regulation, special tax incentives are granted for eco-friendly vehicles such as electric cars, hybrids, bio fuel-based cars and compressed natural gas cars. Unfortunately, the absence of proper follow-up regulations and law enforcement has led to adverse effects, including the use of the cars mostly in urban areas leading to more traffic congestion, and the increased use of subsidized petrol.

Fifty percent of survey respondents indicated that they are not able to meet their sustainability targets and have problems maintaining equipment. Workloads and costs of operating are also higher than they should be (Figure 2.36).

**Figure 2.36  Effect of a lack of skilled workers on environmentally related jobs in the transport sector**

| Not able to expand our work (business) | 0%  |
| Not working as well as we could be    | 50% |
| Costs are higher than they should be  | 50% |
| Higher workloads for existing workers | 50% |
| Having problems maintaining equipment  | 50% |
| Cannot meet sustainability target goals | 50% |

All survey respondents indicated that there have been changes to processes and procedures within their organisations (Figure 2.37). During the interviews companies also identified changes related to recycling oil and water as two major changes. The airport representatives noted that there were no requirements for new skills across the entire workforce but some procedures had changed for different groups of workers. Around 70 to 80 people in 13 airports have received environmental training and 2 new positions have been created in the new health and environmental unit.
During the interviews, one company indicated that they had brought new environmentally friendly vehicles as a result of rising customer expectations. However the introduction of new vehicles did not require major changes to the skills of the mechanics or drivers. The mechanics skills were updated by the vendors through short courses. The bus company, on its own initiative, recycles water that is used for washing the buses and sends waste to different companies for recycling.

**Box 2.14 Green work in logistics**

“One thing to remember is that green logistic is not to be narrowly defined as the use of green material only for packaging. It is fine to use environmentally friendly packaging on our product, but when it comes to shipping the material to the destined location, we are still using a non– environmentally friendly vehicle”.

Source: EdUHK Research Interview. Expert on Green Economy and Green Jobs, Coordinating Ministry of Economic Affairs, Republik of Indonesia

The airline company identified a number of training requirements initiated by international standards and Government legislation. Waste management is an area of training for both ground staff and cabin crew who need to know how to store and dispose of waste. All airline staff have undertaken energy efficiency training. The introduction of fuel efficiency measures has not required mechanics in the airlines to have additional training. Pilots receive additional training in flight simulators to reduce fuel usage. The airline is intending to introduce 2% bio-fuel by 2016 and reduce emissions by 50% by 2050. Most airline training is external and provided by the International Aviation Transport Authority and vendors. The training offered by the International Aviation Transport Authority is high level knowledge-based short courses.

All survey respondents identified TVET training of employees as important (Figure 2.38). The bus company interviewed was involved in providing workplace training for the local private vendor and government TVET institutions. They regularly take third year students for work experience and every month receive a batch of 5 to 10 students. These students are introduced to energy and water efficiency through observing and participating in company procedures. All
companies interviewed and surveyed consider environmental awareness as important to ensure that employees participate in green workplace practices.

Additional new skills identified by the airport representatives included collaboration and benchmarking skills as they have developed benchmarking partnerships with the Korean eco-airport and Mumbai airport. There has also been a requirement for staff to develop environmental awareness and energy efficiency auditing skills. Most training is knowledge based, or minimal skills training in the use of measurement tools and process improvements. Change management training has also been undertaken by management to implement a change in philosophy towards being environmentally friendly.

**Figure 2.38 Influences creating a demand for new skills in the transport sector**

![Influence Bar Chart]

Fifty percent of survey respondents consider it very important for their supply chain to participate in green business practices (Figure 2.39). The airline company commented on how important it was for airports to implement waste management processes.

**Figure 2.39 Issues considered important for becoming environment friendly in the transport sector**

![Issues Bar Chart]
3.4 The hospitality and tourism sector

The tourism and hospitality sector is expected to continue growing at approximately 5.25% by 2014 (ILO, 2012). The sector provided 2.7% of total employment in the country in 2011 (Market Research.com, March, 2013) with the number of jobs expected to increase from 8.1 million to 9.2 million by 2014. According to the Travel and Tourism Competitiveness Index (TTCI) Indonesia is ranked 70 out of 140 while it is ranked 6 out of 140 for its natural resources, suggesting that this is a highly competitive area for expansion. The Ministry for Tourism and the Creative Economy has developed a master plan on promoting six economic corridors and 16 tourism areas. The government plans to allocate US$140 billion for infrastructure developments to support the projected expansion of the tourism and hospitality industry.

Hospitality and tourism survey respondents indicate less effect due to a lack of skilled workers compared to the construction industry. Only 20% indicate having trouble maintaining equipment, and experience higher costs due to a lack of green skills (Figure 2.40). Only 10% of companies have higher workloads for existing workers and are not able to expand their business. Close to 90% of respondents are able to meet their sustainability goals.

Figure 2.40 Effect of a lack of skilled workers on environmentally related jobs in the hospitality and tourism sector

<table>
<thead>
<tr>
<th>Issue</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Not able to expand our work (business)</td>
<td>10%</td>
</tr>
<tr>
<td>Not working as well as we could be</td>
<td>20%</td>
</tr>
<tr>
<td>Costs are higher than they should be</td>
<td>20%</td>
</tr>
<tr>
<td>Higher workloads for existing workers</td>
<td>10%</td>
</tr>
<tr>
<td>Having problems maintaining equipment</td>
<td>20%</td>
</tr>
<tr>
<td>Cannot meet sustainability target goals</td>
<td>10%</td>
</tr>
</tbody>
</table>

Sixty percent of hospitality and tourism companies agreed that job changes have occurred that are related to the greening of their business, suggesting that the surveyed companies may have commenced skilling workers in green skills (Figure 2.41). The ILO in Indonesia has been working closely with the tourism and hospitality sector through an AusAid funded green jobs project and have developed a strategic plan for sustainable tourism and green jobs for Indonesia, in conjunction with the Ministry for Tourism and the Creative Economy. The project included waste management training, green and ecotourism skills training, which covered energy and water conservation, waste reduction, recycling and reuse, pollutants and other harmful substances, general environmental awareness, and conservation and interaction with the local environment and wildlife.
Indecon, a non-profit ecotourism organisation, runs sustainable and ecotourism training in Indonesia. Established in 1995, Indecon has facilitated various ecotourism training programmes for stakeholders and undertaken ecotourism development in the country. Some of the training programmes include:

- understanding tourism and ecotourism;
- developing a tourism and ecotourism plan;
- the tourism and ecotourism market;
- community involvement;
- policy and regulation;
- eco-tour guide training; and
- energy efficiency.

These training programmes are mainly conducted in the regions and support small local businesses. The organisation also runs training in sustainable tourism assessment. The purpose of this training is to provide skills to conduct an assessment of the resource potential of a particular area for the development of ecotourism and sustainable tourism. This may partly explain why the hospitality and tourism industry is not affected greatly by the lack of green skills.

Forty four percent of respondents identified social demand as driving the need for new green skills (Figure 2.42). This social demand, leading to new green skills, most likely relates to attracting inbound tourists to the country for ecotourism purposes through the development of new tourism products. The industry has a growing awareness of the attraction of ecotourism to overseas tourists and more local tourism companies are developing ecotourism products to meet this demand.
While the Government in its Long-Term National Tourism Development Plan (RIPPARNAS), and its tourism Mid-Term Strategic Plan (RENSTRA), communicates the importance of sustainable development and there is a discussion on establishing a green tourism accreditation and certification programme which will increase demand for green skills only, 44% of respondents agreed that Government legislation related to environmental issues is another driver of new green skills development (Figure 2.42). Only one-third (33%) of companies identify customer demand related to environmental issues as a reason for requiring new skills.

**Figure 2.42** Influences creating a demand for new skills in the hospitality and tourism sector

<table>
<thead>
<tr>
<th>Influence</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>The introduction of new international standards (ISO, OHS related to climate change or environmental issues)</td>
<td>40%</td>
</tr>
<tr>
<td>Corporate Social Responsibility related to climate change or environmental issues</td>
<td>20%</td>
</tr>
<tr>
<td>Exporting/ importing requirements related to climate change or environmental issues</td>
<td>10%</td>
</tr>
<tr>
<td>Government legislation related to climate change or environmental issues</td>
<td>40%</td>
</tr>
<tr>
<td>Social demand related to climate change or environmental issues</td>
<td>40%</td>
</tr>
<tr>
<td>Requirement or need to undertake impact assessments related to climate change or environmental issues</td>
<td>30%</td>
</tr>
<tr>
<td>Customer/ client expectations related to climate change or environmental issues</td>
<td>30%</td>
</tr>
</tbody>
</table>

**Box 2.15 Biodiversity and tourism in Indonesia**

Indonesia covers only 1.3% of the earth’s surface, yet harbours 10% of all flowering plant species, 12% of the world’s mammal species, 16% of the world’s reptiles and amphibian species, 17% of all birds species, and more than 25% of known marine and freshwater fish species.

Source: Indonesia Ecotourism Network (Indecon, 2014)

Nearly all the survey participants suggest that environmental awareness is necessary for them to become or remain environmentally sustainable in the ways they conduct their business (Figure 2.43). The interviews suggest that if staff have environmental awareness training they are more likely to adhere to green approaches to work. In addition, the interviews suggest that if senior managers have a greater understanding of the importance of environmental issues they will be more likely to implement sustainable work practices within the organisation. Understanding environmental standards and legislation is considered important by 89% of respondents.
Sixty seven percent consider impact assessments as important. There is growing awareness of the need to protect natural and cultural heritage sites. As businesses develop tourism products that are close to national parks, impact assessments play a central role in product development. Collaborating with local communities features strongly in the global literature on sustainable and ecotourism (Chan and Bhatta, 2013). There is a need to encourage locals to become guides or else to complement the hospitality workforce in regional and remote areas. Thirty three percent of respondents strongly identified collaborating with others as necessary for sustainable business.

Nearly 67% responded that innovation in technology, products and services is important for green business practices. During the interviews innovation was a high priority to creatively develop new products and experiences, such as rafting, work practices and technology for alternative energy, water conservation and waste management.

Almost 70% of respondents give importance to work place based TVET training of potential employees (Figure 2.43) while only 24% consider that there is a good response by education and training institutions to industry skills requirements. This poses questions for TVET providers as to how they may become involved in green tourism and hospitality training in a relevant and valuable way. From visits to the other countries participating in this study, particularly Viet Nam and Sri Lanka, flexible delivery of training in remote and rural communities can have a beneficial effect not only for eco and sustainable tourism but also for local communities themselves. Exploring avenues to introduce onsite and flexible training is a challenge but a potentially important mode of delivery for TVET providers seeking to work with tourism and hospitality.

**Figure 2.43  Issues considered important for becoming environment friendly in the hospitality and tourism**
Box 2.16 World Trade Organisation Secretary-General’s comment on sustainable tourism

“Sustainable tourism has proven to be one of the most effective ways of providing economic and employment opportunities for local communities while protecting the world’s natural resources”


Less than 50% of respondents agreed to the requirement of supply chain businesses or contractors to follow sustainable practices, while many others would like to but do not have worker skills, technology or business practices to support such a move. (Figure 2.44). This is in sharp contrast to the construction sector which reported higher numbers.

Figure 2.44 Requirements from downstream supply chain businesses in the hospitality and tourism sector

Changes in skills profiles due to environmental issues are in the early stages of becoming mainstreamed in Indonesia. Based on demand from the tourism and hospitality businesses interviewed, new skills for sustainable work practices include skills in innovation, collaboration, energy efficiency, waste management, and understanding of international standards for green certification. Raising environmental awareness is also required to effect change within the sector and is the first key strategy in the Sustainable Tourism Strategic Plan developed by the ILO.

3.5 The manufacturing sector

The World Bank reported that 84% of employers in manufacturing have difficulty filling management positions and 69% have problems sourcing other skilled workers (Gropello, Kruse and Tandon, 2010). Manufacturing accounts for 25% of Indonesia’s GDP down from 28% in 2000 (Oberman, 2012). According to a World Bank report (World Bank, 2010), skills have a key role to play to support the further growth and competitiveness of the manufacturing sector, particularly for larger more export-oriented manufacturing, which has remained quite low value-added. One of the main focuses in the Master Plan to accelerate and enlarge economic...
development (MP3EI) is the development of manufacturing processing industries across Indonesia’s main economic corridors (World Bank, 2012b).

Less than 20% of respondents refer to higher workloads for their staff, due to a lack of workers with skills in climate change or environmentally related jobs (Figure 2.45). This suggests why companies may be receptive to green skills training. Very few respondents from the sector consider that the costs are higher, that they cannot meet sustainability goals or are not working as they could be.

**Figure 2.45**  Effect of a lack of skilled workers on environmentally related jobs in the manufacturing sector

Seventy six percent of survey respondents identified job changes as the most significant change related to greening their business (Figure 2.46). Representatives from a garments factory who were interviewed explained that after receiving training on implementing ISO 14001 their Human Resources (HR) unit had proceeded to train supervisors and operators to understand the meaning of environmental management standards in terms of their work. The training covered waste disposal, recycling waste, and they added training on relevant government regulations. The introduction of ISO 14001 was in response to customer demands. One of the middle level management positions has incorporated assessment activities to monitor compliance and they expect to train more people in assessment in the near future. Otherwise no positions have changed due to introducing green workplace practices.
Sixty one percent of manufacturing companies identified changes in importing and exporting requirements that are leading to the need for new skills (Figure 2.47). A garments factory noted that they have had the German TUV (Technischer Überwachungs-Verein, in the English: Technical Monitoring Association) undertake product testing of their radiation protection uniforms. Customer expectations have led the same company to employ an international consultant to provide productivity and sustainability implementation advice on how to achieve ISO 14001 compliance. The same consultant is also supposed to provide support to implement work processes and meet Indonesian regulatory requirements. For 56% of respondents the next strongest influence is on the need for new skills is international standards and social demands.

Almost 44% indicate that customer expectations, the need for environmental impact assessments and Corporate Social Responsibility have created the need for new skills for their organisations. The pulp and paper manufacturer interviewed identified all these areas as important influences on changing work practices. They employed a consultant to work with them across these areas looking to extend behavioural change from the workplace to the local community and to the families of workers. The company has a continuous improvement programme and employees are encouraged to put forward ideas meaning that problem solving, creativity and innovation skills are important. For them, team work is another important area for continuous improvement followed by the introduction of Lean management which is built on their waste reduction and waste management initiatives. The move to sustainability was a voluntary move in recognition of the benefits to their long term survival as a company.
Raising environmental awareness amongst staff is considered important by 78% of the manufacturing businesses surveyed. While most of the interviewed companies provide staff training in-house, or through outside trainers, they felt that most TVET training does not meet their needs and does not have an environmental focus. They believe that TVET has an important role in developing their lower level workers. Almost 78% respondents believe that TVET is important in skilling workers for green workplace practices, while 72% of respondents believe that collaboration is important in developing and maintaining green business practices (Figure 2.48). Innovation is another area mentioned as important during the interviews particularly for process improvement purposes and innovation. Sixty one percent of survey respondents consider innovation skills as important.

Figure 2.47 Influences creating a demand for new skills in the manufacturing sector

Figure 2.48 Issues considered important for becoming environment friendly in the manufacturing sector
An ongoing trend seen in all sectors in all four countries is the importance placed on supply chains to have green business practices or to use green products. Nearly 41% of respondents agree to the requirement of supply chain businesses or contractors to have a sustainable infrastructure. Thirty five percent prefer their suppliers to have sustainable and green consumption and production processes and 29% require them to be energy efficient (Figure 2.49).

**Figure 2.49 Requirements from downstream supply chain businesses in the manufacturing sector**

<table>
<thead>
<tr>
<th>Requirement</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Energy efficiency</td>
<td>29%</td>
</tr>
<tr>
<td>Recycling</td>
<td>12%</td>
</tr>
<tr>
<td>Sustainable consumption and production processes</td>
<td>35%</td>
</tr>
<tr>
<td>Sustainable infrastructure</td>
<td>41%</td>
</tr>
<tr>
<td>Green products or services</td>
<td>35%</td>
</tr>
</tbody>
</table>

Whilst energy efficiency is an issue, companies are less concerned about the supply chain being energy efficient with only 29% considering it to be important. This may be because the cost saving that provide benefits to individual companies is immediate whereas most supply chains do not have to undertake green accounting and calculate the full environmental cost of developing their product.
Box 2.17 Training provider’s initiative

“This initiative by the PT Esemka / PT Solo Manufaktur Kreasi (National Car Company with production mainly based in SMKs), Solo City started from one SMK (Vocational School) that decided to implement the Government initiative ‘Teaching factories at schools’ and focus on production. Thirty teachers and students learnt car and computer assembly at the SMK and went to a car company to learn about the making of moulds, casting and finishing. The SMK further collaborated with the university, to learn about chassis moulding and with ATMI in Solo to learn about transmissions.

Thirty three schools now have assembly lines and are engaged in car making – PT Esemka. It takes three weeks to produce one car. For one car production, 2 permanent workers and 8 students work together. Equipment is shared between companies and schools.

PT Esemka is based on MOUs between schools and companies. Companies look after quality control, delivering raw materials and after-sales service (with SMKs involved). Companies are also in charge of logistics, collecting parts produced by different SMKs and distributing them to other SMKs for assembly. Teachers and students (while enrolled in SMKs) have shares in the companies.

Cooperation with Polytechnics provides an opportunity for a higher education for students and for them to develop practical skills.

In response to the tax incentives announced by the Ministry of Environment for ‘low cost green car’, the SMKs are now working on developing an engine size of less than 1 litre.”

Source: EdUHK Research Interview
3.6 **Key sector specific findings and important realisations**

**Box 2.18 Key sector specific findings and important realisations**

All five sectors consider TVET to be important for their business to become environmentally friendly in their operations. However, there are varying degree of satisfaction with the way training institutions respond to the skill needs of the country;

- manufacturing respondents are most satisfied with Vocational Secondary Schools (SMKs). Almost 56% have frequent contacts with TVET institutions and provide feedback on the skills of graduates, students and the curriculum. Nearly 77% consider the work-based training of potential employees to be important to very important. Polytechnics and universities are less responsive according to the manufacturing survey respondents;

- construction and energy companies found universities to be responsive to their skills development needs. Seventy two percent of construction companies provide feedback on student graduate skills and on curriculum content. Only 18% of construction respondents are satisfied with SMKs. Tourism and hospitality providers were also less satisfied with SMKs and Polytechnics;

- most firms surveyed regularly review the skills of their workforce. All companies interviewed provide some form of training for their workforce with most training being informal;

- tourism and hospitality firms provide in-house training on a regular basis. They also prefer private training over that provided by government and send more women for up skilling, while the energy companies surveyed provide internships for their staff. Apprenticeships occur at a lower frequency (2 out of 4) than do internships;

- construction and manufacturing sectors access training through conferences, tradeshows and industry association initiatives;

- all sectors participating in the study are experiencing some demand for green skills: more in the energy and construction sectors, and less in the manufacturing sector. Less than 10% in tourism and hospitality report a need for green skills;

The individuals or groups of people interviewed have an understanding about the importance of green economy, green jobs and green skills; however, there is less clarity of thought on the ways these can be best institutionalized. Bringing about change in the mandates and prescribed norms of an institution is daunting and a slow process;

Understanding of green practices is quite sharp between primary sector (agriculture), secondary (manufacturing) and tertiary sectors (services). While the agriculture sector has shades of “green” when it comes to sustainable practices such as water conservation, use of fertilizers and cropping patterns, the services sector is centered more around conserving energy. The industry sector receives maximum attention when it comes to sustainable processes such as pollution control, recycling, waste management, procurement, and energy audits. While the demands for green skills in traditional manufacturing industry mostly arise out of compliance with regulations, demands in new industries such as renewable energy production arise out of the resource crunch and global sustainability arrangements. Therefore even within the industry sector, there are different “shades of green” which need to be considered, when developing strategies;

A lack of incentives, competition and a resource crunch are deterrents for companies to invest in sustainable practices. While large companies are able to invest and push forward the green agenda, small and medium enterprises are less motivated. There is a large private TVET sector in Indonesia which has not been covered in this survey. The findings are centric to SMKs and Higher Education-VTPs. It is important to capture views of private training providers because they could respond to market gaps and industry requirements much faster than does government TVET.

Source: EdUHK Team Analysis
4 Recommendations and the way forward

While climate change commitments, laws on environmental protection, and compliance with emission standards take shape in Indonesia, the education and skills development system needs a paradigm shift to align with the growing needs of industry for environmentally sustainable skills in every job-role. Managing this alignment is difficult to achieve. While at one level there may be policy challenges (such as integrating economic, industrial, environment and skill development policies), at another level there may be institutional bottlenecks to balance multiple efforts ranging from compliance related matters, to ensuring productivity, to saving costs, to managing innovations, to being competitive and developing human capital. Apart from these matters there are issues of quality, equity, governance, and finally capacity and capability, both human and financial, which need strategic directions to be able to achieve the objective of green growth.

One of the strongest messages emerging from this study is that there is a need to revisit the archetypal approaches to address issues within education, training and to align them with sustainable growth. For example, strict regulation does not necessarily result in compliance, the scope of green jobs may be limited but the scope of green skills in all jobs is unlimited. Ensuring a transition towards green growth with adequately trained human capital is not easy to achieve.

4.1 Achieving a policy paradigm towards green skills

All policies have a history and a legacy which influence the present and have implications for the future. All policies are also formulated for a reason which may be relevant to the socio-economic and political realities at the time of its formulation. But that should not deter revisiting the past, and rationalizing or sharpening policy to accommodate the present context and desirable future directions. For example, it would be important to assess and establish the extent to which the Indonesian National Qualifications Framework (KKNI, Kerangka Kualifikasi Nasional Indonesia) or the 2013 new curriculum by MoEC, are actually aligned with the Law of the Republic of Indonesia No.32/2009 on Environmental Protection and Management, No. 30 / 2007 on the National Energy Policy, Presidential Regulation No. 70/2009 on Energy Conservation, and No. 61/2011 on reducing greenhouse gas emissions. More important is the assessment of the scope for effectively and seamlessly dovetailing together policies related to green jobs and green skills.

The journey from advocacy for policy coordination, to action in policy coordination towards green skills, may entail a number of steps across the 34 ministries, 511 autonomous regions and 34 provinces:

- consensus between political, social and industrial leadership on alignment between economic, industrial, environment, education and skill development policies. The State Ministry for National Development Planning (BAPPENAS) is in a unique position to coordinate this effort because it has developed Indonesia’s Long Term Development Plan for 2005 and 2025, however the ministry needs to be empowered further and its jurisdiction widened;

- bringing in international expertise and good practices to learn ways and methods of policy rationalization; and
• capacity development of institutions and individuals on processes and tools to sustain the policy paradigm;

4.2 Achieving the institutional mind-space and mind-set for green skills

Institutions (both government and private) are largely inelastic. The burden of existing issues overshadows the importance of emerging issues. The urgency to deliver targets or exhaust budgets often makes institutions neglect issues that may have a long term impact and may go past a point of no return. Even though individuals in the institutions may be aware, or be sensitive to emerging issues, these may not be absorbed into the institutional agenda.

Similarly, most government institutions or SME institutions are more responsive in complying with policy directions and regulatory provisions than in developing priorities for themselves. While government institutions cannot move out of the framework of their constitution, the elaborate small and medium enterprise network is mostly confined by the need to return a profit. They may superficially agree with the green growth agenda, but find it difficult to accommodate this in a highly competitive market. However, the large private corporations have both the capacity to influence policy as well as small and medium enterprises, many of which are part of supply chains. In addition, the large number of international multilateral agencies can play a coordinated role to achieve maximum impact.

The tourism and hospitality sector is expected to continue growing at approximately 5.25% by 2014. The sector provided 2.7% of the total employment in the country in 2011 with the number of jobs expected to increase from 8.1 million to 9.2 million by 2014. The government plans to allocate US$140 billion for infrastructure developments to support the projected expansion of the tourism and hospitality industry. In the World Economic Forum 2013 Travel and Tourism Competitiveness Index (TTCI) Indonesia is ranked 70 out of 140 (World Economic Forum 2013). The 2013 TTCI gives Indonesia a rank of 6 out of 140 for its natural resources meaning that this is a highly competitive area for expansion. Suggesting eco-tourism may be a sub-sector ready for additional support.

Models for sustainable tourism and regional development identified during this four country study suggest a deeper level of partnership and collaboration is required to produce wide ranging skill development benefits for industry, its value chain and local community members. By doing so helps to safeguard local community life options that provide meaningful work choices without eroding their relationship with the local environment. Added to this, the sustainable tourism industry relies strongly on its value chain to ensure quality experiences and products and collaboration with stakeholders will enable a robust value chain. There is plenty of research examining sustainable livelihood models (Brocklesby, Fisher, 2003, Seville, Buxton, & Vorley 2011) and research on cluster approaches to skills development, such as skill ecosystems (Buchanan et al. 2000, Conway & Loker 1999, Waits 2003) which demonstrate the benefit that these approaches can bring to local communities and businesses.

Skill ecosystems are industry skill clusters but focus on the skill and workforce dynamics. Like industry clusters, skill ecosystems are a concentration of interdependent businesses, institutions and regions, or communities. The proposed model merges a value chain examination of the flow of goods and services to the customers and a cluster approach, of a geographic concentration of interconnected businesses, suppliers, and associated institutions creating direct and indirect synergies among them. With the emphasis in both cases being on skills development.
A model that supports inclusive green growth at a local community level could be widely implemented and would strengthen small informal economies. The model proposes a holistic approach with an emphasis on participation, partnership, skills development and participatory learning approaches. Small communities often operate in areas with inadequate infrastructure and a challenge is providing ongoing skills development alongside developing networks and linking informal enterprises with more formal tourism and hospitality value chains. The same challenge confronts TVET with providing pathways from informal skills development into formal TVET. The question TVET organisations will need to ask when participating in a pro-poor PPP model for sustainable tourism is “what are the unique features of this community in this value chain that provides competitive advantage?” and “what are the changing content needs of this vocational stream to reflect this uniqueness?” to map and identify the skill needs of these pro-poor PPP models for sustainable tourism.

Figure 2.50 A Pro-Poor Public Private Partnership model for local sustainable tourism development

The approach requires interaction of the local community with skills providers and industry, with intermediaries, who may be from a training institution or an NGO working in green tourism, or cleaner production, to facilitate the partnerships within the frameworks of government policy safeguards and environmental and cultural security.

Facilitation of local partnerships is not necessarily straightforward, requiring long lead times and multiple stakeholder commitment and interaction to ensure successful implementation. The use of intermediaries to develop market linkages and develop viable business practices needs to be underpinned by skill development intermediaries. As views on regional development have been expanding, recognition of the importance of innovation in economic and social development has resulted in an increase in government and industry initiatives to support innovation. Facilitating the development of green skills and innovation can provide a platform
for a demand led skills development approach to support local business development opportunities. These can provide a framework for local community members to meet and exchange ideas on improving facilities and adding more value to their products to think beyond what is required for different business opportunities and how it can be done better. This is an iterative process of consultation adaption of training to meet new needs.

The uniqueness of skill ecosystems, local communities and industry clusters is context. The uniqueness of occupational clusters is content and for value chains the uniqueness is the continuum or flow or a development process (USAID 2008).

Defining industry skill needs is becoming more complex as skill shortages, skill gaps and vacancies are harder to define this is also true in rural areas where people combine outside work with farm work to supplement their incomes. This is particularly important for skills development as skill needs are not always apparent nor are future green skill requirements. Ensuring that skills are productive for the longer term will require some initial investment in developing a collaborative environment between industry, training providers and the local community and articulating achievable goals.

Sustainable local tourism does not just result in the promotion of eco-tour guides and green homestays, the demand is also for niche products such as organic produce including food and toiletries, handicrafts, cultural activities, waste, energy and water management, ecotourism, farm-based tourism, adventure tourism. This can offer alternative livelihoods for rural communities by creating off farm employment. All of these require new skills, for example, organic foods need to be stored and transported so they do not spoil, cultural activities need to be planned for presentation to audiences. However, this kind of employment does not necessarily result in improved life options, with low remuneration, long working hours, unstable employment and casual work often the norm. One of the lessons learnt in the (USAID 2008) report states that, ‘a cluster approach can be a valuable mechanism to address value chain constraints, especially those requiring the transformation of stakeholder relationships’ (p.3). The importance of linking training to the formal TVET system means that local community members have a choice whether to remain in the work they are doing or to training for something different.

There is recognition that voluntary certifications are currently one of the most highly visible efforts linking farmers to markets, or tourists to reputable operators while creating incentives for environmental and social progress. The growing awareness of ethical tourism provides a strong pull for anchor companies, such as larger hotels and travel agencies, within the value chains. Formal certification can lead to greater incomes choices and more secure employment.

Facilitating the development of a strong skills base will result in tourism products that can cater to wealthier target groups, for example, fishermen who learn to catch and store fish in a manner that is consistent with flexible preparation and cooks who can produce a range of foods. Whilst wealthy customers do not guarantee decent work, careful public policy dialog and planning that involves larger urban hotels, training institutions, the local community, NGOs and other stakeholders can work to establish safeguards. Large urban hotels are anchor companies that are strategically important to the value chain for sustainable and ecotourism, with customers seeking green tourism moving from urban areas to cultural and natural environments and rural areas supplying the food, workers and handicrafts. Facilitating the identification of skill needs and structuring decent work safeguards will require close analysis and consultation requiring skilled facilitators working with stakeholders.
Support materials such as the Guidelines on Integrated Rural Sustainable Tourism Development and the six ASEAN Tourism Standards particularly; Green Hotel, Ecotourism and Tourism Heritage standards do provide immediately useful resources. Along with resource materials, resources to support the longer term facilitation of dialogue between industry, local communities and local government are important to ensure the viability of local sustainable tourism and the wider benefits to the tourism industry as a whole. This requires an individual or organisation to facilitate local sustainable tourism development plan and to identify the skill requirements for the local community to deliver products and services to support different local tourism options.

The Strategic Plan for Sustainable Tourism and Green Jobs for Indonesia, developed by the ILO, on behalf of the Ministry for Tourism and the Creative Economy, identifies a sustainable approach to tourism planning as one of the necessary implementation strategies. The sustainable approach to tourism planning envisaged in the plan proposes the community and local people as key stakeholders and determinants of success. The plan notes that the improvement in the quality of life of host communities participating in tourism development is a key indicator, along with tourist satisfaction ratings. This model supports Indonesia’s more autonomous regional approach, which is reflected in the formal TVET sector. Reviewing regional and local tourism plans regarding their sustainability approaches and building in local green skill development needs will help to build a consolidated local skills base while sustainable tourism infrastructure is being developed and should be encouraged.

Some of the key strategic initiatives in this direction could be:

- **leveraging large private corporations** such as Astra International, the Lippo Group or public sector corporations such as Perusahaan Gas Negara, Perusahaan Listrik Negara, and Pertamina to initiate green skills objectives. For example, ecolabel accreditation and certification for manufacturing products is a good initiative, and similar standards and initiatives can be influenced by large corporations as well both in upstream and downstream industries;

- **supporting and funding models of innovation** in products and practices towards green and sustainable development. For example, initiatives such as those of Agromakmur in Karanganyar focussed on developing innovation through the use of alternative energy. They train the rural community, especially young people, to undertake the production of various alternative energy sources such as bio ethanol, bio fuel, biogas, and micro-hydro;

- **developing case studies of national and international replicable models.** The Ignatius Loyola building at ATMI Cikarang is built with the first environmentally friendly design and technology in Indonesia. Yayasan Dian Desa initiatives in waste management, stove and kitchen improvements need country wide information dissemination;

- **multilateral agencies can take a coordinated stand** towards developing a national programme directed towards green growth. For example, ILO is working with local communities on the Indonesian island of Kalimantan on a green jobs programme called the “Green Livelihood Access for Central Kalimantan’s Inclusive Environmental Response to Climate Change” (GLACIER) which can access United Nations Development Programme (UNDP) funds for energy conservation and environmental initiatives. There is GiZ’s Policy Advice for Environment and Climate Change
(PAKLIM) programme to implement and disseminate climate mitigation and adaptation measures. Conservation International is working in Sundaland areas, Wallacea areas, and tropical wilderness areas of Irian Jaya in the hospitality and tourism sectors and can build a synergy with other international initiatives; and

- both industry and the training sector respond to regulations, and they also respond to incentives. Incentives can be offered by Government, multilaterals, and large corporations. Incentives can be in the form of employee training, brand development, and goodwill expansion. Non-monetary incentives can be in the form of awards such as Adipura (a clean and green cities awards programme), Kalpataru or ratings such as PROPER. These can be balanced with monetary incentives such as the recent special tax breaks for producers of green automobiles who will receive a reduction of luxury-goods sales tax, as low as zero percent.

**Box 2.19 Green skills in small and medium enterprises**

“From the perspective of business, there is a need to link between green skills and green jobs. Green skill needs to be integrated into millions of our Small Medium Enterprises (SME) throughout Indonesia, which I personally believe will create a better product value to the customer.”

Source: EdUHK Research Interview. Director of Center for Health and Safety Ministry of Manpower, Jakarta
Box 2.20 Labour Market Information System (LMIS) Initiative

“Local level vocational schools in Central Java have been using an IT tool to make and streamline job placements. This has resulted in authorities being able to readily access new employment figures. In South Sulawesi and Central Java, industry associations, with support from GIZ, have begun systematic consultations with their members to identify their preferred qualification profiles. The ILO has undertaken skills gap analysis of Aceh and support was given to the construction of regular labour statistics systems at the national and provincial levels in Indonesia.”

In all five sectors companies are involved in the informal review of staff training needs and to some extent provide both formal and informal skill development opportunities. Most companies take a just-in-time approach to developing the skills of their workforce and generally wait until new equipment or processes are being introduced. In the case of some companies such as the aviation sector skills forecasting is to some extent done internationally by the regulatory body. Most companies draw on multiple sources to identify the skill needs of their workforce, with the interview participants citing industry magazines, industry associations and new government or international regulations as sources to identify new skills for their workforce.

Quality labour market data is a precondition for reliable analysis to take place, leading to the development of new and the evaluation of the design of national skills development strategies and their related policies. However, due to data availability constraints, and the large size of the Indonesian informal economy, a qualitative approach to a skills gap analysis has been used in some instances at national and regional levels and could be used to supplement information on green skills. This approach is complimentary to understanding the informal economy and involves combining an analysis of major economic and policy trends and their impact on skills demand through local community consultations. This is an intensive process requiring time and the allocation of resources at the local level to identify market driven skills demand, policy driven and livelihood driven skills demands. Livelihood driven skills identification plays important role in poverty alleviation and reduction and this approach is combined in the sustainable tourism model identified earlier in this paper.

The LMIS approach that is evolving in Indonesia is developing at a regional level offering the opportunity to capture information on green jobs similar to the approach in Viet Nam. The modification of fundamental skills that are required in a labour market evolve relatively slowly (Karmel, 2009) and explicitly collecting data on labour force changes due to climate change will highlight any skill trends that are occurring. Most of this information will involve qualitative analysis to make sense of any changes and to identify appropriate skill development responses and any supporting policy initiatives.

The Viet Namese approach to regional skills identification through Employment Service Centres is a model that could fit well at the Indonesian regional level, where they would be well positioned to facilitate green growth at a local level by providing a full complement of services beyond skills development. National LMIS systems are still evolving and are likely to incorporate information on green jobs as the country and Indonesian business are susceptible to the negative effects of climate change.

Source: EdUHK Research Interview
4.3 **Direction for human capital development for green skills**

While formal education and the TVET system are important components in human capital development, these are not the only route to acquiring skills. Skills are attained informally, through up-skills training in the workplace and sensitivity towards the environment is often developed through social interactions and public communications. It becomes important that green skill development should not only be understood as a matter of curriculum and content limited to TVET institutions, but as something that should be built into a larger ecosystem of education, workplaces, social interactions and political debates.

Public debates, research, and media support become important in creating a larger eco-system towards developing green skills. Some of the specific institution strategies could be:

- the New Curriculum of 2013 (Government Regulation No.70, 2013) and National Education Standards, can be dovetailed with the Indonesian National Qualifications Framework (KKNI). The Indonesian National Standards (*Standard National Indonesia*, SNI) can also accommodate skills development standards and green skills standards. International expertise can be sought to manage this process and to also build capacities of the committee and the ministry;

- trainers in the TVET institutions and in other vocational education programmes, are one of the most important cadres of people who can be the torch bearers of green skill development. While engagement with teacher training institutions or teachers’ unions is important for in-service development, interventions are also required at higher education institutions;

- co-location of training providers with industry may improve the relevance of training, improve teacher industry experience, offer research and development opportunities, create more responsive delivery arrangements and foster industry skills development clusters. This, combined with dedicated training institutions that reflect the skill development value chain of Industrial Training Institutes (ITIs), polytechnics and universities, could provide the full range of skills demanded by industry. For example, the six economic corridors identified in Indonesia would also have corresponding vocational education programmes. Community colleges would be jointly developed by government, and business enterprises, with a university as coordinator. The quality of community colleges would be controlled by polytechnics that are developed in provincial capital cities. The polytechnics are therefore developed in accordance with the potential and advantages of each economic corridor. These colleges are expected to produce graduates who can be absorbed directly by the economic activity in the centres of economic growth in every economic corridor;

- research on green growth, green industry and green skills needs to be promoted in higher education. Well funded special research packages can be designed and partnerships can be encouraged with leading universities around the world that have expertise in the field of green skills;

- rather than waiting for a comprehensive green curriculum to evolve, key knowledge about green skills, can be introduced into the existing curriculum and initiatives. As a first step, themes such as: responsible and efficient handling of materials (including hazardous materials), energy saving, waste management, recycling and related matters can be introduced into existing education and skill development programmes. The
target should not only be TVET institutions but also schools and higher education institutions. The example of partnership between Budha Tzuchi Foundation and National Institute of Science and Technology (ISTN) targeting secondary school students is noteworthy;

**Box 2.21  Green jobs in schools and tertiary education institutions**

“The Ministry of Youth and Sport has been interacting with schools and tertiary education institutions in promoting green jobs opportunities. We have contacted schools and higher education institutions to form a partnership in creating green jobs opportunities, but unfortunately, without knowing the exact definition of green jobs, we are facing many problems in our implementation. So the only thing we could do is to promote this issue by discussing with school principals, students and their teachers on how to create sustainable and long-lasting jobs that would help improve the quality of life to a level much higher than the usual jobs.”

Source: EdUHK Research Interview. Head of Learning, Directorate of Vocational Education, Ministry of Education and Culture, Jakarta

- the benefits of up-skilling the existing workforce, in sensitivity to the environment and resource optimization, should be communicated widely to the small and medium enterprise sector. Workers can be encouraged to up-skill through means such as leadership programmes, competitions, and recognition of prior learning programmes;

- NGOs, and self-help-groups (SHGs), can be targeted with special green skill modules to reach out to the community and involve women, and marginalized groups (including unemployed and underemployed youth) in developing green skills. These may or may not be employment related skills. For example, the NGO Padi in East Kalimantan province implements a micro hydro programme and conducts training in skills for technical installation, operation, and maintenance of micro hydro equipment; and

- all forms of media, print, radio, TV and social, can be encouraged to develop communication strategies on the importance of green growth and green skills. The messages can be intelligently positioned so that not only the media but the community at large sees the value in the importance of industry moving toward greener practices, with green skill development becoming a necessity rather than an option. The massive media campaign in the recent past to promote vocational education in Indonesia has been quite popular and has brought about some change in the education preferences of the population.
Table 2.2 Framework for policy planning for green growth, green jobs and green skills

<table>
<thead>
<tr>
<th>Policy consensus</th>
<th>Industry alignment</th>
<th>TVET planning</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Green Growth</strong></td>
<td>Converging economic, climate, industrial and TVET policies</td>
<td>Promoting ‘green’ sectors, ‘green’ products</td>
</tr>
<tr>
<td><strong>Green Jobs</strong></td>
<td>Investment and incentives for promoting sustainable and decent jobs</td>
<td>Adopting ‘green’ practices; discouraging climate damaging activities and processes in the supply/value chain</td>
</tr>
<tr>
<td><strong>Green Skills</strong></td>
<td>Recognition, monetary incentives and facilitating national and international employment for specialised ‘green’ skills</td>
<td>Recognition through higher pay and career progression for specialised ‘green’ skills</td>
</tr>
</tbody>
</table>

Source: EdUHK Team Analysis

4.4 Areas for further research

This research has been an exploratory study of education and skills for inclusive growth and green jobs, and the greening of the economy, in Indonesia. The research has highlighted the need to undertake further research in the following areas in order to fill the gaps that exist in the current data, with regard to:

- examining various geographical parts of Indonesia: The respondents to the survey questionnaires were mainly from Jakarta and nearby areas, while the interviewees were also from Yogyakarta. Indonesia is a diverse country in terms of rural as well as urban characteristics, and with regard to the socio-economic status of different parts of the country. It would therefore be useful to undertake the same survey and conduct interviews with population groups in other parts of Indonesia;

- importance of the informal and non-formal economy, sometimes called the disorganised sector: This study focuses on the formal, organised economy but much of the economic activity in Indonesia occurs in the disorganised sector. It would be helpful to therefore also survey the non-formal economy to ascertain whether the findings from this study also hold true for that economy;

- the rural sector: The emphasis in this study has been on various secondary industries such as construction, transport, hospitality and the like. But most employment in Indonesia currently occurs in the rural sector, and so it would be relevant to undertake
a study, which examines the same issues, concerns and challenges, with those working in the rural sector;

- small and medium enterprises: There is an unavoidable underrepresentation of small and medium enterprises in this study, and yet most businesses in Indonesia are SME’s. It would be helpful to focus more on SME’s in administering the same survey instruments and conducting interviews;

- gender issues with regard to inclusive growth and green jobs: This research study did seek to gather information about and survey the matter of gender issues, but overall there is a paucity of information available and a lack of reliable research evidence in this area, most of the data being anecdotal in nature; and

- unemployed and underemployed youth: Likewise, in the case of youth, with particular reference to unemployment and underemployment, there is a lack of useful or reliable evidence in this area. Given the major problem of youth unemployment, further research in this area would be helpful for policy makers.

### 4.5 Concluding comments

Skills development and training needs to be overhauled as the global economic and environmental scenario changes. Vocational training or skills development can no longer afford to take a linear approach to learning generic content, followed by specific components and later advanced content. What is required is a non-linear approach because jobs today are becoming more modular in nature.

Multidimensional skills are needed that include the understanding of raw-materials and resources, and the processes that transform them into final products, with sensitivity towards the environmental issues embedded into the whole process. Therefore generic green skills are viewed by industry as measures to reduce costs and increase profitability, suggesting that the holders of these skills are valued by employers.

The labour market across industry sectors is demanding jobs that are more environmentally sustainable and decent as there is growing evidence that skills shortages may be impeding the transition to green growth in some sectors. Taking a wider view of green skills, similar to the ILO’s decent work agenda, initiatives are required to be integrated into local communities and industry that can produce results leading to new business opportunities and further generate supplementary green employment.

Policy makers and practitioners have a major task to balance emerging needs and priorities with the existing implementation frameworks. The balance has to accommodate norms and standards from global agreements whether they be the Millennium Development Goals or Climate Change agreements. They need to tread a fine line between industry demand, economic priorities and environment mandates or inclusive development.

Fortunately, there is no lack of knowledge around the subject. Knowledge from within and about other countries, and partnerships with international agencies, are available to bring new perspectives, new models, innovative practices, flexible funding and high quality research, to develop individual and institutional capacities to deliver large scale programmes around green economy, green jobs and green skills.
## 5 Summary of government initiatives – Indonesia

<table>
<thead>
<tr>
<th>No.</th>
<th>Ministry/Department</th>
<th>Some of the Schemes/programmes/institutions having provision for vocational education and training</th>
</tr>
</thead>
</table>
| 1.  | Ministry of Education and Culture           | SMK - 9,164 numbers  
Higher Education – Vocational Training Providers  
Polytechnics  
Universities  
Advanced school for the arts of Indonesia  
SMK Job Expos                                                                 |
| 2.  | Ministry of Industry                        | Vocational Secondary School in Industrial Technology (SMTI) – 7 numbers  
SMKs – 9 numbers  
Industrial Training Centre (BDI)  
TVET institutions at the tertiary level – 8 numbers                                                                 |
| 3.  | Ministry of Agriculture                     | Vocational Secondary School in Agriculture and Development (SMK PPN)  
Agricultural Training Centre (BPP)                                                                 |
| 4.  | Ministry of Forestry                        | Vocational Forestry Secondary School (SMKK) – 5 numbers                                                                                                                        |
| 5.  | Ministry of Religious Affairs               | Islamic Vocational Secondary School (MAK)                                                                                                                                            |
| 6.  | Ministry of Manpower and Transmigration     | Vocational Training Centre (BLK) – 260 numbers  
SKKNI – Indonesian National Competency Standard                                                                                                                                   |
| 7.  | Ministry of Energy and Mineral Resources    | TVET institutions and a training centre in electric power, new energy and renewable energy (KEBT) – 3 numbers  
Administers a professional certification agency (LSP) and an assessment centre in energy audit                                                                                   |
| 8.  | Ministry of Tourism and Creative Economy    | Hospitality and tourism academies and institutes – 5 numbers                                                                                                                         |
| 9.  | Ministry of Marine Affairs and Fishery      | SMKs – 8 numbers  
Academies – 2 numbers  
TVET at tertiary level – 1 number                                                                                                                                                    |

Source: EdUHK Team Analysis
## 6 Policy and action matrix - Indonesia

<table>
<thead>
<tr>
<th>Recommendation</th>
<th>Suggested policy</th>
<th>Suggested activities</th>
<th>Implementation agency</th>
<th>Rationale (Potential benefits/Incentives)</th>
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<tbody>
<tr>
<td><strong>STRATEGIC LEVEL</strong></td>
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<tr>
<td>Policy integration</td>
<td>Strengthening and expanding Master plan for Acceleration and Expansion of Indonesia Economic Development (MP3EI), 2010, to achieve better alignment among economic, industrial, environment, education and skills development policies</td>
<td>Assessment to examine elements such as technical skills in improving existing landfill techniques; research skills in energy conservation program in demand side management (DSM) targeted by Ministry of Environment (Second National Communication under The United Nations Framework Convention on Climate Change - UNFCCC)</td>
<td>National Council on Climate Change (NCCC) and Indonesian Climate Change Council, National Board on Development Planning (BAPPENAS) along with Ministry of National Education and Culture (MoEC), Ministry of Energy and Mineral Resources</td>
<td>Identification of areas for immediate action on green skill development</td>
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<td>Climate change policies have a clear pathway to develop human resources for the sectors</td>
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<td>Policy framework to invite international expertise and adopting good practices on green skills</td>
<td>Capacity development of institutions on processes and tools for green skills at departments such as National Board on Development Planning (BAPPENAS); Ministry of Education and Culture and the Ministry of Manpower and</td>
<td>National Board on Development Planning (BAPPENAS) with multilateral agency support such as UNIDO, Organisation for Economic Cooperation and Development (OECD), Asian Development Bank, The World Bank, United Nations, ILO,</td>
<td>Enhanced capacity to design integrated policies</td>
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<td>Availability of knowledge and expertise on good practices</td>
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<td>Recommendation</td>
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<td>Implementation agency</td>
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<tr>
<td>Green practices to become a ‘business’ issue</td>
<td>Policy on green standards in each sector</td>
<td>Large corporations such as Astra International, the Lippo Group or public sector corporations such as Perusahaan Gas Negara, Perusahaan Listrik Negara, and Pertamina along with Indonesia Chamber of Commerce &amp; Industry (KADIN) to financially support, reward and recognise</td>
<td>Large corporations along with industry associations such as Indonesian Chamber of Commerce &amp; Industry (KADIN), Importers Association of Indonesia (GINSI), and Indonesian Exporters Association (GPEI)</td>
<td>Availability of clear direction to include green skill strategies in industrial practices. Creation of a vibrant ecosystem to adopt and promote green practices and related green skills Additional revenue streams in the</td>
</tr>
<tr>
<td>Recommendation</td>
<td>Suggested policy</td>
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<td>models of innovation in green practices. Initiatives can be supported by the Indonesian government, bilateral and multilateral development agencies, domestic and foreign private entities/initiatives as well as market-based mechanism such as CDM (Clean Development Mechanism), voluntary carbon offsets and PES (Payment for Environmental Services) Green models to be patented or creating subscription-based green process management modules to generate additional revenue stream to companies Benefits of up-skilling on green skills need to be communicated widely during industry summits and trade fairs</td>
<td>Ministry of Industry, Ministry of Trade, Ministry of National Education and Culture (MoEC)</td>
<td>form of patent fees and consulting services for the industry</td>
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<tr>
<td>Recommendation</td>
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<tr>
<td>Include green practice standards in the industrial policies especially for new economic corridors such as Sei Mangke, North Sumatra and Tanjung</td>
<td>organised by associations such as Indonesian Chamber of Commerce &amp; Industry (KADIN), Importers Association of Indonesia (GINSI), and Indonesian Exporters Association (GPEI). TVET system can house similar discussions during teacher training programmes and occupational training. Well funded research products with leading universities on green technologies and green practices in industry through Ministry of National Education and Culture (MoEC)</td>
<td>Promote co-location of training providers with industry clusters. These could be targeted at special economic zones (SEZs) by opening up industrial parks</td>
<td>Ministry of Industry, Ministry of Trade, Ministry of National Education and Culture (MoEC)</td>
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<tr>
<td><strong>Support for green growth, green jobs and green skills from foreign aid and investment agencies</strong></td>
<td>Lesung, Banten, Riau Islands of Batam, Bintan, and Karimun. and training centre/s together</td>
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<td>Consolidation of initiatives of aid agencies</td>
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<tr>
<td><strong>Bridge the gap between TVET outcomes and jobs requirements</strong></td>
<td>Common agenda and policy between foreign aid and investment agencies with respect to green growth, green jobs and green skills</td>
<td>Documenting and sharing green investment advisory notes promoting green growth at regular intervals, advocating the agenda of green skills to support a greening economy at global scale using platforms like G-20, ASEAN summits and capacity building on national and international good practices on green skills</td>
<td>Aid agencies – Asian Development Bank, The World Bank, United Nations, GIZ, ILO, DFID, USAID</td>
<td>Greater emphasis on green skill development through a unified approach of aid agencies</td>
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<td>Large corporations along with industry associations such as Indonesian Chamber of Commerce &amp; Industry (KADIN), Importers Association of Indonesia (GIINSI), and Indonesian Exporters Association (GPEI); Ministry of Industry, Ministry of Trade; Ministry of National Education and Culture (MoEC)</td>
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<td>Enhanced capacity to adjust curriculum development to industry needs</td>
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<tr>
<td>OPERATIONAL LEVEL &lt;br&gt;Initiate easily implementable activities around green skill development</td>
<td>Include elements of green skills/education by initiating reforms and aligning the New Curriculum of 2013 (Government Regulation No.70, 2013) and National Education Standards, with the Indonesian National Qualifications Framework (KKNI). Include green skills standards in The Indonesian National Standards (Standar Nasional Indonesia, SNI)</td>
<td>Develop and include green skill knowledge nuggets in existing education curriculum – school, technical, higher education</td>
<td>National Board on Development Planning (BAPPENAS); Ministry of National Education and Culture (MoEC); Ministry of Manpower and Transmigration</td>
<td>Fast-tracking inclusion of green skills in skill development ecosystem</td>
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<td>Include green job training in the list of training priorities among TVET institutions</td>
<td>Ministry of National Education and Culture (MoEC); Ministry of Manpower and Transmigration</td>
<td>Broad basing of green skill development across sectors</td>
</tr>
</tbody>
</table>

This will allow to support greening of industries.
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<td></td>
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<td>Strengthen institutional linkage between higher education institutions and TVET institutions in the area of green skill development</td>
<td>Ministry of National Education and Culture (MoEC)</td>
<td>Greater integration between higher education and TVET institution (a good practice)</td>
</tr>
<tr>
<td>Include elements of green skill/education in Teacher Education programs</td>
<td>Include generic and specific green skills in pre-service and in-service teacher training guidelines, programs and courses</td>
<td>Ministry of National Education and Culture (MoEC)</td>
<td>Capacity enhancement of pre-service and in-service teachers on introduction of green skills</td>
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<tr>
<td>Outcome based incentives for enterprises and TVET institutions</td>
<td>Direct and indirect incentives to promote green skills</td>
<td>Giving direct financial incentives in the form of tax breaks, subsidy, and viability gap funding, innovation funds for the private sector to move towards sustainable processes</td>
<td>Ministry of Finance, along with Ministry of Industry and Trade along with Ministry of National Education and Culture (MoEC)</td>
<td>Creation of green jobs and increased demand for green skills</td>
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<td>TVET enterprises offering green skill development training can be entitled to general incentives concerning vocational</td>
<td></td>
<td>Promoting green skills training</td>
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<td>training under governmental regulations or be allowed to recover training expenses through users or sponsoring institutions</td>
<td>Ministry of Industry, Ministry of Trade; Ministry of Education and Culture</td>
<td>Provide an enhanced opportunity for TVET providers to organise workplace learning as a part of their curriculum, so students can be exposed for greening practices</td>
</tr>
<tr>
<td>Policy on support of TVET practicums/workplace learning</td>
<td>Use incentives to support enterprises in their engagements with TVET institutions</td>
<td>Ministry of National Education and Culture (MoEC) along with Indonesia Chamber of Commerce (KADIN), Directorate General of</td>
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<td>Positioning messages on green practices through all forms of media</td>
<td>Ministry of National Education and Culture (MoEC) along with Indonesia Chamber of Commerce (KADIN), Directorate General of</td>
<td>Higher sensitivity towards environmental issues</td>
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<td>Sensitivity towards sustainability to become a ‘social’ issue</td>
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<td></td>
<td>Special green skill modules targeted to women and marginalised groups Special green skills development programs targeted for rural areas</td>
<td>Ministry of National Education and Culture (MoEC); Ministry of Manpower and Transmigration, Ministry of Social Affairs and Ministry of Justice and Human Rights along with NGOs, Self-Help-Groups (SHGs) State Ministry for Cooperatives, Small and Medium Enterprises; State Ministry for Women Empowerment; State Ministry for Accelerated Development of Backward Regions</td>
<td>Greater participation of women and marginalised groups in environment friendly activities leading to equitable engagement of all stakeholders Inclusion of rural population will impact on social wellbeing due to increased quality of the environment</td>
</tr>
</tbody>
</table>