GREENING TVET
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Greening TVET (Technical and Vocational Education and Training) is a key element of sustainable development and an important priority of the Vietnamese Government in its commitment to successfully implementing the Vietnam National Green Growth Strategy. Greening TVET does not only equip the workforce with necessary skills to perform well in the workplace, but also enhances essential knowledge and competencies to cope with existing and future social, economic and ecological challenges.

Acknowledging the importance of Greening TVET, the Directorate of Vocational Education and Training (DVET), in cooperation with the Vietnamese-German Programme “Reform of TVET in Vietnam”, compiled this “Greening TVET” brochure. The brochure is developed from the results of technical workshops on the ‘Action Plan for Greening TVET’, and on ‘Greening of TVET institutes’ organized in July 2018, as well as various Vietnamese and international reports focusing on this topic. The brochure provides basic concepts and understandings about Greening TVET with the intention to contribute to awareness-raising about this issue, and to successfully integrate Greening TVET in the national TVET system.
Climate change and employment

The escalation of industrial and agricultural production and high consumption levels have led to massive depletion of natural resources.

Climate change, higher temperatures, droughts, floods, sea level rises pose significant challenges to employment, productivity and growth.

Jobs everywhere are dependent on a stable environment

- 40% of total world employment depends directly on ecosystem services (e.g. agriculture, tourism, etc.)
- Between 2000 and 2012, greenhouse gas (GHG) emissions, which cause climate change, increased by 33% worldwide
- Between 2000 and 2013, material extraction increased by 62%
- By 2030, work hours lost due to heat stress could be as high as the equivalent of 72 million full-time jobs
- 23 million working life-years have been lost every year since 2000 due to natural disasters resulting from human activities

Vietnam is the most energy intensive economy in South East Asia

Vietnam recorded an eightfold increase in CO² emissions between 1990 and 2011

Vietnam is among the top 5 countries most affected by climate change

Vietnam is among the top 10 countries with worst air quality and 60,000 deaths annually linked to air pollution

Vietnam is among the top 4 countries that emit the largest amount of plastic waste into the oceans
TRANSITIONING TO A GREEN ECONOMY

Anticipated changes

1.5 billion people
Half of the global workforce is affected by the transition to a greener economy

New markets
New markets will be created around technologies and services to cater for new sustainable ways of life and to respond to new environmental regulations

New jobs
Significant new jobs will be created to meet the need for environmentally friendly goods and services E.g: pollution-control devices manufacturing

Existing jobs become greener
The majority of existing jobs will be transformed and greened, applying green methods to save the environment E.g: plumbers, electricians, construction workers

New occupations
New occupations will be created to meet certain expertise required by the green economy E.g: Wind energy mechatronics

Certain jobs will be substituted
E.g: Waste burial jobs will be substituted by recycling jobs

Certain jobs will be eliminated without direct replacement E.g: by discontinuation of the production of plastic packaging materials
The transition to a greener economy could generate up to 60 million new jobs.

The renewable energy sector currently employs 8.1 million people worldwide.

60% of people working globally in the renewable energy sector are from the Asia-Pacific region.

14 million jobs could be created in the region if countries adopted changes in energy use that limit global warming to 2°C.

There is a strong realisation among industries that the best way to manage increasing costs is to adopt sustainable and green practices.

The demand for green skills in Vietnam is increasing in the five high-growth sectors of construction, transport, energy, hospitality and tourism, and manufacturing.

The highest demand for green jobs is in hospitality and tourism, followed by the manufacturing sector.

Power sector in Vietnam: Renewable energy is estimated to account for more than 30% of energy resources in 2030.
A green economy is one that results in:

- Improved human well-being and social equity
- Significantly reduced environmental risks and ecological scarcity
Green jobs can be found in all sectors: agriculture, industry, services & administration.

All jobs can be and should become greener.
Green skills are:
The knowledge, abilities, values and attitudes needed to live in, develop and support a sustainable and resource-efficient society

Areas of competences needed both for green jobs and sustainable lifestyles include:

- **Ecological literacy**
  
  Do you know how your actions affect natural systems?

- **Systems thinking**
  
  Can you develop a ‘systems thinking’ or lifecycle approach to what you buy and use, which looks at when the raw materials are mined, right through to when the different parts are disposed of?

- **Design and technology understanding**
  
  Do you know about the appropriate designs or technologies to minimise the impacts of technologies you use?

- **Cultural contexts**
  
  Do you understand your cultural context, so that you can adapt relevant solutions to local contexts or places?
Skills for green jobs can be broken down into three categories of skills sets:

- **General sustainability literacy**
- **Occupation-specific STEM (Science, Technology, Engineering and Maths) skills**
- **Management and leadership skills aimed at green transition**

New green occupations and jobs in a green economy often require better qualifications and skills to meet:

- **New technology applications**
- **More sophisticated requirements in terms of organisation, cooperation, consultancy**

In the transformation to a green economy:

- **The need to upgrade skills in existing occupations**
- **The need to create new occupations**
The International Labour Organisation (ILO) provides a list of core skills necessary for green jobs:

- Adaptability and transferability skills to learn and apply the new technologies and processes required to green jobs.
- Strategic and leadership skills to help policy-makers and business develop cleaner production, cleaner transportation and so forth.
- Environmental awareness and willingness to learn about sustainable development.
- Coordination, management and business skills to attain economic, social and ecological objectives.
- Systems and risk analysis skills to assess, interpret and understand both the need for change and the measures required.
- Entrepreneurial skills to seize the opportunities of low-carbon technologies.
- Innovation skills to identify opportunities and create new strategies to respond to green challenges.
- Communication and negotiation skills to discuss conflicting interests in complex contexts.
- Marketing skills to promote greener products and services.
- Consulting skills to advise consumers about green solutions and to spread the use of green technologies.
- Networking, IT and language skills to perform in global markets.

Source: ILO: Skills for Green jobs – A global view (2011)
Green skills checklist (United Kingdom)

- A substantial checklist of green skills needed for the transition to a greener economy was developed within the framework of a report for the UK Government. The list includes 10 broad groups of skills (Tier 1):

  1. Design skills
  2. Waste skills
  3. Energy skills
  4. Water skills
  5. Building skills
  6. Transport skills
  7. Material skills
  8. Financial skills
  9. Management skills
  10. Policy and planning skills

- Broad groups of skills in Tier 1 are further specified in Tier 2 and Tier 3

  **Example:**

<table>
<thead>
<tr>
<th>Tier 1</th>
<th>Tier 2</th>
<th>Tier 3</th>
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<tbody>
<tr>
<td>7. Material</td>
<td>Sourcing</td>
<td>Sources of low-energy materials, sources of low-mileage materials,</td>
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<tr>
<td>skills</td>
<td></td>
<td>recyclates (secondary materials), energy-efficient raw material</td>
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<td></td>
<td></td>
<td>extraction, industrial symbiosis, transport mileage</td>
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<td></td>
<td>Procurement and selection</td>
<td>Use and properties of low-energy materials and of recyclates, industrial</td>
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<td></td>
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<td>symbiosis, low-carbon and resource-efficient procurement, cost</td>
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<td></td>
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<td>impact of climate change on material procurement</td>
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<td></td>
<td>Material use and impact quantification</td>
<td>Material usage calculations, life-cycle assessment and costing</td>
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<td></td>
<td>Management systems</td>
<td>Material use planning, material flow process design and implementation</td>
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<td></td>
<td>Impact and use minimization</td>
<td>Life-cycle assessment and costing, energy-efficient process design</td>
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Source: ILO: Skills for Green jobs – A global view (2011)
GREENING TVET

Characteristics of green TVET

<table>
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<th>Green TVET:</th>
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<tbody>
<tr>
<td>• Is a role model for eco-friendliness in the community</td>
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<td>• Is a trusted strategic partner for sustainable development issues in the region</td>
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<td>• Actively integrates internal and external partners in the greening process</td>
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<td>• Reduces environmental impacts on their campus</td>
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<tr>
<td>• Integrates green issues into their programmes systematically</td>
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<tr>
<td>• Improves the living conditions of the local communities</td>
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**GREENING TVET**

**Characteristics of a green TVET**

Greening TVET

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**IS NOT ABOUT**

- A one-time makeover of the institution or programme
- A destination
- An add-on accomplishment or one-time success story

**IS ABOUT**

- Part of the institution’s culture and DNA. Can be observed and measured over time
- An ongoing and evolving process that responds to the changing needs and opportunities of the institution, the world of work and the world
- An on-going item built into the core framework of education and training
GREENING TVET
The whole-institution approach

Based on TVET performance that meets the skills requirements of the labor market, green TVET institutes follow a holistic framework that is built upon the following:

- Greening the campus
- Greening the curriculum
- Greening the methodology
- Greening the community
- Greening institutional culture

Embedment in the school management

Skills development

Greening is an integral part of the TVET management system
Objectives

- Consistently reduces the campus environmental impacts
- Improves the quality of staff and students working conditions
- Creates a healthy and safe environment for all social groups, religious beliefs and genders
- Makes the campus accessible for people with disabilities

Fields of actions

**Air and climate**
- Green house gas emission reduction
- Air pollution reduction

**Energy consumption**
- Efficient use of energy
- Renewable energy use

**Waste**
- Waste minimization
- Recycling

**Soil and eco-system**
- Green areas preservation
- Biodiversity

**Transportation**
- Accessibility to public transport
- Shared transportation
- Bicycle use

**Food service**
- Local food products
- Healthy food products

**Hazards management**
- Handling of hazardous substances

**Building**
- Design and construction
- Operation and maintenance
- Campus density

**Water consumption**
- Reduction of water consumption
- Reduction of water pollution
Integrate green skills requirements into existing courses

- Add green skills requirements that are cross-occupational

Add green skills requirements for specific occupations

- New modules on green technologies/green processes can be added to existing courses
- Adapt relevant contents to ensure that learners acquire skills and knowledge to perform jobs in a more sustainable manner

Develop training programmes for new green occupations
Integrate green skills requirements into existing courses:

- Add green skills requirements that are cross-occupational

Example: Cross-occupational learning outcomes for Green TVET
(Catalogue of learning outcomes for “Green TVET” – Vietnamese-German “Programme Reform of TVET in Viet Nam”)

At the end of the training the student is able to:

1. Explain the relevance of the Vietnam Green Growth Strategy and the Green Growth Action Plan for his/her college and partner company and his/her occupation using examples
2. Apply relevant environmental protection regulations at the workplace
3. Give examples of organisational, technical and behavioural measures for environmental protection/efficient use of energy and resources in the college and the partner company
4. Describe possible environmental risks at his/her workplace and how he/she can minimize these risks by correct occupational behaviour
5. Use energy effectively and efficiently
6. Use natural resources and materials effectively and efficiently
7. Apply the "3 Rs" of the so-called waste hierarchy (reduce, reuse, recycle)
8. Store and handle hazardous substances as well as hazardous waste in an environmentally friendly manner
Add green skills requirements for specific occupations

- New modules on green technologies/green processes can be added to existing courses

**Example:** Modules on environmental protection and sustainable tourism are integrated into Vietnam Tourism Occupational Standards (VTOS) – Travel operator and travel agent, issued by the National Administration of Tourism in 2016
At the end of the training the student is able to:

1. Evaluate the ecological impacts of different joining and separation techniques
2. Avoid unnecessary energy consumption by correct planning, processing and maintaining of manufacturing processes
3. Avoid scrap and high rate of material consumption by correct planning, processing and maintaining of manufacturing processes
4. Handle auxiliary and operating materials (e.g. cooling lubricants, solvents, oils, fuels and anticorrosive) in an environmentally friendly manner (especially avoidance of emissions to air, soil or water)
5. Separate and dispose unusable components as well as scrap metals and plastics according to the requirements of the waste management system of the college and the partner company

Add green skills requirements for specific occupations
- Adapt relevant contents to ensure that learners acquire skills and knowledge to perform jobs in a more sustainable manner

Example: Requirements for green knowledge and skills to be integrated into the learning outcomes for Construction Mechanics Technicians
(Catalogue of learning outcomes for “Green TVET” – Vietnamese-German “Programme Reform of TVET in Viet Nam”)
If a specialisation in an already existing occupation as well as additional training modules/qualifications are not seen as meeting the specific skills requirements in green economic sectors specific green occupations can be developed.

Examples of green occupations:

- Water supply engineering technician
- Sewage engineering technician
- Recycling and waste management technician
- Pipe, sewer and industrial service technician
- Organic farmer
- Solar energy technician
- Wind energy mechatronic
Greening the methodology is the use of practice-based and trainee-oriented methods to find out practical ways to make products, processes and services greener.

Green methodology encourages project-based activities, cross-subject or cross-disciplinary learning and learning by doing.

Example of green learning activities where such methods can be used:

- TVET teachers and trainees survey the energy efficiency of buildings in the campus to recommend solutions to improve the efficiency.
- TVET teachers and trainees research and design learning materials using recycled materials.
- Trainees calculate and compare the costs of energy consumption/reduction options in the class/building.
GREENING TVET

Greening the community

Refers to TVET contribution to the greening of work environments/businesses and the community through:

- Promoting practices to reduce environmental impacts of business operations
- Joint development of sustainability programmes to address local issues

Example: In Ninh Thuan Vocational College, a volunteer club called “For a green-clean-beautiful Ninh Thuan province” was established. Every month, the club organises clean-up activities on the beach, in the main square and public spaces. Such activities raise public awareness and responsibilities to protect the environment.
The institute’s vision for sustainable development is reflected in the whole-institutional approach, whereby greening is embedded in all aspects of school operation:

- Teaching methodology and content
- School management and ethics
- Human capacity development
- Campus and facility management
- Quality management
- Cooperation with the business sector and partnership

Environmental awareness is reflected in the daily behaviors and habits of everyone in the school, from the school management board to teachers and trainees.

Environmental friendliness and sustainable development are values to promote the school branding, benefiting both trainees when looking for jobs and schools to have effective and long lasting partnerships with enterprises.

**Example:** Vocational College of Mechanics and Irrigation (VCMI) in Dong Nai province, under the Ministry of Agriculture and Rural Development is trying to build a green institutional culture via small daily actions: say no to plastic bottles, keep classes and workshops clean... Every Friday, all teachers and managers clean the campus.

VCMI is integrating green aspects in its existing occupations and also developing two new green occupations based on German standards.
Greening is an essential & integral part of TVET management and leadership

TVET managers:
- Initiate, promote and support the greening process
- Provide human resources, financial and physical support for the greening process
- Lead the process through personal examples and active collaboration

Green activities are an essential part of the institute’s:
- Vision and mission
- Strategic plan and operation procedure
- Quality management system
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