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BGZ

REPORT

TOWARDS GREEN TRANSITION IN VIETNAMESE VOCATIONAL TRAINING CURRICULA

Ha Noi, December 2024

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The report was intended to 1) understand the design of vocational training curricula and all relevant standards implemented in Vietnam, with a specific case study of the electrical sector; 2) propose solutions to integrate green/climate change/sustainability content into vocational training programs; 3) gain insights into the current practices of international cooperation in vocational education, with a particular focus on green vocational initiatives.

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LIST OF ACRONYMS

MOLISA	**The Ministry of Labor, War Invalids and Social Affairs**
DOLAB	**Department of Overseas Labour**
ILO	**International Labour Organization**
VCMI	**The College of Mechanics and Irrigation**
HATECH	**Hanoi Vocational College of Technology**
BCI	**Bac Ninh College of Industry**
HHT	**Hanoi Vocational College of High Technology**
TVET	**Technical vocational education and training**
MOU	**Memoranda of Understanding**
TITP	**The Technical Intern Training Program**
EPS	**The Employment Permit System**
COLAB	**The Center of Overseas Labour**

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EXECUTIVE SUMMARY

The main purpose of this report is to provide an overview of the current vocational training curricula in Vietnam and its green transition based on an understanding of existing TVET policies/ regulations and recent cooperation initiatives between the Vietnamese government and foreign governments/ international non-governmental organizations.

Chapter II addresses the Vietnamese regulations for the design and development of vocational training programs across elementary, intermediate, and college levels. It highlights several training programs currently implemented in selected vocational institutions in the field of industrial electricity. One major observation is that these programs tend to focus more on technical subjects and less on environmental concerns, green skills, and soft skills. Although technical training programs have started to include subjects related to energy conservation and efficiency, green skills have not yet been systematically integrated as compulsory outcomes for students upon completing their courses.

Chapter III explores how green skills and environment- and climate change-related contents have been or could be integrated into the existing curricula. Various strategies proposed to incorporate sustainability into training programs include introducing courses on green vocational skills, embedding green content into existing subjects (particularly general education courses), or, at a more modest level, organizing extracurricular activities with a green theme.

Chapter IV examines dynamics in the collaboration between the Vietnamese government, foreign governments, and international organizations in supporting workforce skills development for the green transition. Vietnam's cooperation in vocational training and the deployment of workers abroad is expanding. These collaborative training programs may take different forms, depending on the needs and capabilities of the parties involved. Such cooperation can substantially enhance the green skills of Vietnamese workers if they gain exposure to green technologies and receive systematic training allowing them to apply these skills when working abroad. Moreover, for training collaborations at vocational schools, fully transferred programs from countries like Germany ensure that green standards are applied at vocational institutions in Vietnam through mutual agreements.

I. General Background

To meet the demand for specialized skills in key industries, Vietnam is placing greater emphasis on vocational education with a series of new policies and legal regulations issued during the period of 2020-2024. The National Strategy on Vocational Education Development for the 2021-2030 period, with a vision through 2024, aims to achieve a target of 30% of the workforce having completed training with diplomas or certificates by 2025 and 35%-40% by 2030. To reach these goals, one of the main solutions proposed is innovating and developing vocational training programs incorporating new technologies and future skills, as well as implementing training models that support sustainable development. The Decision No.882/QD-TTg, dated July 22nd, 2022, issued the National Action Plan to Promote Green Growth for the 2021-2030 period also requires educational programs and activities at all educational levels to be integrated with green growth.

To concretize these solutions, on February 19th 2024, the Ministry of Labor, Invalids, and Social Affairs (MOLISA) issued Circular No.01/2024/TT-BLDTBXH, which outlines the process for developing, evaluating, and issuing vocational training programs, as well as the preparation, selection, approval, and use of textbooks for the intermediate and college levels. This new Circular replaces Circular No.03/2017/TT-BLDTBXH, which is expected to address shortcomings in the previous regulations regarding the development of vocational training programs at intermediate and college levels. Additionally, vocational training at the elementary level is currently governed by Circular No.42/2015/TT-BLDTBXH dated October 20, 2015, which was amended by Circular No.34/2018/TT-BLDTBXH dated December 26, 2018. These legal documents are now under review, with a new draft circular developed to regulate vocational training at the elementary level.

Along with that, the network of vocational training institutions is also under restructuring. According to the Planning the Network of Vocational Education Institutions for the Period 2021-2030, with the vision to 2045,[1] by 2025 the number of public intermediate vocational schools will be reduced by 40%, and by 2030, this figure will reach 50%. Additionally, the number of colleges will decrease.

At the macro level, one of the most comprehensive public administration reforms is taking place within the Vietnamese government.[2] Accordingly, 14 ministries and ministerial-level agencies will be restructured, rearranged, and merged, including several functions, such as vocational

[1] Decision No.37/QD-TTg on Approving the Planning for Vocational Education and Training Facility Network of 2021-2030 period and vision to 2045.

[2] VnExpress, *Plan to streamline Vietnam governments' organizational apparatus finalized*, available at <https://e.vnexpress.net/news/news/politics/plan-to-streamline-vietnam-government-s-organizational-apparatus-finalized-4824472.html>

education, of the Ministry of Labor, Invalids, and Social Affairs, to be transferred to the Ministry of Education and Training. This process will also influence the transfer 3 vocational colleges[3] (Vocational College No. 1 - Ministry of National Defense, Vocational College No. 4 - Ministry of National Defense, Vocational College No. 20 (located in Nam Dinh)- Ministry of National Defense under the Ministry of National Defense) to the Ministry of Labor and War Invalids and Social Management by December 2024 as per the Joint Resolution of the thematic Government meeting in August 2024. This process may involve substantial changes in the management system and vocational administrative procedures, which might require up to 3-4 years to complete.

II. Vocational Training Curriculum

2.1. Overview of Vocational Training Program

According to the Law on Vocational Education 2014, vocational education is an educational level within the national educational system, which aims at training workers at the elementary, intermediate, and college levels, as well as offering other vocational training programs.[4] Based on this definition, vocational education is divided into three levels: elementary-level training, intermediate-level training, and college-level training. Corresponding to the different training levels, the requirements for developing training programs also differ. Hence, there is currently no precise data on the number of vocational training programs being implemented. However, according to the MOLISA's regulations on vocational training programs, there are approximately 660 professions for college-level training and 897 professions for intermediate-level training[5] with a total of 1886 vocational training institutions.[6]

Regarding the design and development of training programs, as per the Law on Vocational Education 2014, the head of the central government agency responsible for vocational education will specify the minimum knowledge volume and the required competencies that learners achieve upon graduation for each vocational education level and for each training occupation.[7] For the time being, there are around 16 Circulars issued by the MOLISA listing these required competencies for more than 100 fields. These requirements serve as the foundation for vocational training institutions to design and develop training programs.[8] Hence, it is possible for related industry standards or other relevant standards to be incorporated into vocational

[3] Cong dan & Khuyen hoc Newspaper, *Proposal to Transfer Three Vocational Colleges from the MOLISA*, available at <https://congdankhuyenhoc.vn/de-xuat-dieu-chuyen-3-truong-cao-dang-nghe-thuoc-bo-quoc-phong-ve-bo-lao-dong-thuong-binh-va-xa-hoi-17924082714004791.htm>

[4] Article 3 (1) Law on Vocational education 2014

[5] Circular no.26/2020/TT-BLDTBXH

[6] MOLISA, <https://www.molisa.gov.vn/baiviet/239531>

[7] Article 34 (4), Law on Vocational education 2014

[8] Article 34 (2),Law on Vocational education 2014

education programs. At the national level, the Vietnamese Qualifications Framework was issued in 2016 to classify and standardize the capacity, minimum academic load, and qualifications suitable for specific levels of vocational education and undergraduate education in Vietnam. Besides, national occupational skill standards are also developed by relevant state agencies in accordance with the Law on Employment 2013 and Circular 56/2015/TT-BLDTBXH.[9] At the regional level, the ASEAN Qualifications Reference Framework can be used to develop a vocational training curriculum.

There are some drawbacks that could be observed from current vocational training programs:

First, Vietnam has not set a mechanism to anticipate and monitor the demand for green jobs and the required skills for environmentally sustainable development, such as the National Observatory for Jobs and Occupations of the Green Economy in France. In general, the identification of the demand for green jobs and the related skills will be performed on an ad hoc basis. For example, the General Statistics Office will identify and list green jobs/green sectors; accordingly, the MOLISA will design and decide to make pilots in a group of sectors or a group of vocational training institutions. This creates challenges for educators to design and develop a vocational training program that prepares students to meet the needs of the current job market.

Second, there exists no mechanism in Vietnam to ensure the systematic incorporation of green skills into vocational training curricula. One one hand, the national plan for green growth requires integrating green growth into educational programs and activities at all educational levels. On the other hand, the required competencies for students to achieve upon finishing the vocational training program as set out by the MOLISA do not include any knowledge, skills, or attitudes related to climate change/environment/sustainable development.

Third, soft skills continue to receive insufficient attention. Except for the compulsory general modules required by MOLISA, vocational training institutions have the autonomy to design curriculum by selecting subjects and modules. However, only one out of four curricula for industrial electricity occupations we reviewed includes soft skill modules.

Fourth, culture-based stereotypes exist and can pose serious challenges to recruitment of quality students. In Vietnam,[10] university degree is still favored over vocational training due to the

[9] Circular 56/2015/TT-BLDTBXH dated December 24, 2015 guiding on the development, appraisal and publication of national occupational skill standard

[10] Tran Thi Phuong Hoa (2020), French Colonial History, Michigan State University Press (Volume 19), available at <https://muse.jhu.edu/pub/26/article/778553/pdf#:~:text=The%20modern%20Vietnamese%20vocational%20training,the%20French%20model%2C%20while%20the>

embedded history of the Confucian social hierarchy originating from China.[11] As a result, only those who cannot pass entrance exams or cannot afford to attend universities will consider applying for vocational training. Moreover, universities in Vietnam are currently striving to increase their enrollment numbers by adopting multiple admission methods and lowering entry requirements. The expanded access to universities, coupled with the belief that a university degree guarantees better job opportunities, leads many students to overlook vocational schools. This decision is often made without thoroughly considering other critical factors such as personal aptitude, labor market demands, career development trends, and more. Besides, gender stereotypes and consequent inequality exist, preventing technical vocational education and training programs from maximizing the potential of girls and female workers.[12] In Vietnam, three types of bias against girls' participation in TVET include: (1) refusal to recognize gender inequality as a real problem; (2) assumption that girls cannot study technical subjects as well as boys; and (3) misperception that girls are not as interested in technical subjects as boys.[13] Based on our small-sized sample of interviews, however, female teachers can be equally qualified and demonstrate even greater leadership and interpersonal skills compared to male teachers. Yet, the number of female students has not picked up.

2.2. Minimum Knowledge Volume and Required Competency for students to Achieve upon Finishing a Vocational Training Course

Current vocational training programs must, at least, meet the requirements regarding *(1) The minimum knowledge volume* and *(2) the required competencies* for students to achieve, as specified in the circulars issued by the MOLISA.

Regarding the minimum knowledge volume[14] and course duration, table 1 shows the comparison between three vocational training levels:

[11] Junjun Huang (2021), *A comparative research about the related factors influenced on the attractiveness of vocational education and training between China and Germany*, available at <https://ub01.uni-tuebingen.de/xmlui/bitstream/handle/10900/117213/Junjun_Huang_A%20comparative%20research%20about%20the%20related%20factors%20influenced%20on%20the%20attractiveness%20of%20vocational%20education%20and%20training%20between%20China%20and%20Germany.pdf?sequence=1&isAllowed=y>

[12] Christine Lagarde, Jonathan D.Ostry (2018), *Economic Gains from Gender Inclusion: Even Greater than you thought*, available at <https://www.imf.org/en/Blogs/Articles/2018/11/28/blog-economic-gains-from-gender-inclusion-even-greater-than-you-thought>

[13] GIZ, Gender in TVET, available at <https://www.tvet-vietnam.org/wp-content/uploads/2024/11/202411_Gender-in-TVET_infographic_key-findings_VN.pdf>

[14] Minimum amount of knowledge could be defined as the minimum number of credits or modules that learners must have.

No.	Level of vocational education	Objectives	Course duration	Minimum study units	Ratio of theory study and practice
1	College level	Equip students with abilities to perform intermediate-level tasks and some complicated and special tasks; acquire abilities to create and apply modern technology to their jobs; instruct and observe other members in their groups in performing the tasks.[15]	02 - 03 years[16]	60 credits	- Theory: 30% - 50% - Practice: 50% - 70%
2	Intermediate level	Equip students with abilities to perform elementary-level tasks and some complicated and special tasks; apply technology to their jobs, work independently or work in groups[17]	01 - 02 years[18]	- 35 credits for high school graduates - 50 credits for middle school graduates	- Theory: 25% - 45% - Practice: 55% - 75%
3	Elementary level[19]				

[15] Article 4 (2) Law on Vocational Education 2014

[16] Article 33 (3) Law on Vocational Education 2014

[17] Article 4 (2) Law on Vocational Education 2014

[18] Article 33 (2) Law on Vocational Education 2014

[19] Article 4, Circular No.42/2015/TT-BLDTBXH

	Elementary level I	Equip students with abilities to perform simple tasks of a particular job[20]	03 months - under 01 year (at least 300 real learning hours)[21]	05 credits and 03 modules	- Theory: No more than 25% - Practice: No less than 75%
	Elementary level II			15 credits - 09 modules	
	Elementary level III			25 credits - 15 modules	

Table 1: Comparison of the minimum knowledge volume between vocational training levels

The learning duration includes actual study time and time allocated for final exams, assessments at the end of subjects or modules, and review and graduation exams for year-based training courses. Actual study time refers to time spent attending lectures, conducting experiments, participating in discussions, practicing, interning, or learning through an integrated method that combines theory and practice at practical sites.

Time for general activities includes the opening and closing ceremonies, mid-term and end-of-year reviews, summer vacations, public holidays, and contingency planning.

One theoretical hour equals 45 minutes, while one practical/internship hour equals 60 minutes. One credit is defined as a minimum of 15 hours of theoretical study, 30 hours of practical/laboratory/discussion, or 45 hours of internship/project work/major assignments/thesis preparation. Time allocated for guided self-study or self-preparation is not converted into credits.

Each module could have a volume of 2 to 6 credits. Some specified modules can have a credit count of less than 2 or more than 6.

Regarding the minimum required competencies, Required competencies include (1) Knowledge, (2) Skills, và (3) Autonomy and responsibility.

- *Intermediate and college-level*

[20] Article 4 (2) Law on Vocational Education 2014

[21] Article 33 (1) Law on Vocational Education 2014

These requirements for vocational education in each industry are stipulated and issued by MOLISA. For example, in fields related to electrical, electronic, and telecommunications engineering, the learning outcomes required for students are specified in Circular No. 48/2018/TT-BLĐTBXH dated December 28, 2018. For training programs in industries that have no specific regulations on minimum knowledge volume and required competencies, the minimum requirements set out in Circular No.12/2017/TT-BLĐTBXH dated April 20, 2017 and Circular No.04/2023/TT-BLĐTBXH dated June 15, 2023 which amended and supplements several provisions of Circular No.12/2017/TT-BLĐTBXH, shall apply. See Annex 1 for the list of Circulars regulating the minimum amount of knowledge and competency requirements for learners of vocational training programs at elementary, intermediate, and college levels.

- *Elementary level*

Circular 42/2015/TT-BLDTBXH provides the required competencies for elementary-level graduates, and Circular No. 34/2018/TT-BLĐTBXH, Circular No. 43/2015/TT-BLĐTBXH. These required competencies are applied to all elementary-level training programs of all professions. Specifically, as follows:

- Knowledge:
    - Understand and possess fundamental knowledge of the requirements and standards for each task within the profession; be able to apply certain knowledge in performing tasks and pursue further learning at higher levels.
    - Have an understanding and knowledge of occupational safety and hygiene standards related to the job, the workplace, and the working environment.
- Skills:
    - Be capable of performing simple tasks or repetitive work within a profession, along with other necessary skills compatible with the occupation.
- Autonomy and Responsibility
    - Have the ability to receive, document, and convey information as required; understand the requirements, standards, and outcomes for tasks in surrounding roles or related jobs; take responsibility for the results and products of one's work.

In addition, each occupation has its national occupational skill standard that is developed and issued by relevant state agencies. The MOLISA issued Circular No.56/2015/TT-BLĐTBXH guiding the development, appraisal, and publication of national occupational skill standards, which set out a framework with five levels for occupational skills as below[22]:

[22] Article 5, Circular 56/2015/TT-BLDTBXH dated December 24, 2015

Level	Requirements
Level 1	- Perform simple and repetitive works in an unchanged working context - Have a narrow range of basic knowledge about the profession and activities of the job in some areas and the ability to apply knowledge and skill to perform work as directed - Have the ability to receive, record, and transmit information as required; ability to carry out teamwork with other people and take partial responsibility for the results of work
Level 2	- Perform regular tasks and some complex tasks in a number of specific situations; - Have a broad range of basic knowledge about the profession and activities of the job in many areas; ability to apply knowledge and skill to solve common professional, and technical matters and some complex issues with the guidance of instructors -Have the ability to think, judge, and explain information; autonomy in teamwork with other people and the ability to work independently in some contexts; take main responsibility for the results of work
Level 3	- Perform a large number of complicated works, works that have many methods in some different contexts; - Have professional and basic knowledge about the principles, theory, and extensive knowledge of the activities of the job in many contexts; utilize the knowledge to provide solutions for a number of complex professional, and technical matters and some requirements of the manager; - Have the ability to determine, analyze, and evaluate broad-range information; have autonomy, work independently and guide other people to perform tasks; take responsibility for the quality of work as prescribed by the standard and partial responsibility of the results of work performed by a teammate.
Level 4	- Perform most complicated works, works that have many methods in different contexts; - Have professional knowledge about the principles, theory, and extensive knowledge of the activities of the job in many contexts; utilize the knowledge to provide solutions for a number of complex professional, and technical matters and some requirements of the manager; - Determine, analyze, and evaluate broad-range information and use the results to provide ideas and recommendations for management and research purposes; work independently with substantial autonomy; have the ability to manage and operate others in the execution of tasks, take

	responsibility for the quality of work as prescribed by the standard and partial responsibility of the results of work performed by a teammate.
Level 5	- Perform complicated works, works that have many methods in every context; - Have professional knowledge about the principles, theory, and extensive knowledge of the activities of the job in many contexts; have the ability to analyze, consider, diagnose, design to solve solutions, and handle a broad range of complex technical issues or requirements of the manager; - Know how to analyze, evaluate, and generalize information to provide ideas and recommendations for management and research purposes; work independently with substantial autonomy; have the ability to manage and operate others in the execution of tasks, take responsibility for the quality of work as prescribed by the standard and responsibility of results of work performed by a teammate in accordance with technical specifications and standards.

Table 2:Five levels for occupational skills in accordance with national occupational skill standard

2.3. Intermediate and College-level Training Curricula

a) The structure of the curriculum

According to Circular No.01/2024/TT-BLDTBXH,[23] the structure of the curricula applying to every profession is required to have the following components:

1. Name of training industry of the profession
2. Sector code
3. Training Level
4. Target learner
5. Training time
6. Numbers of learning time (hours, credits)
7. Description of the training program (profession)
8. Training objectives
9. Summary Table of Competencies for the Programs' Industry/Occupation.
10. List and duration of subjects and modules (compulsory, elective)
11. Detailed content of subjects and modules
12. Instructions for use of the training program.

b) List of subjects/modules:

[23] Article 4, Circular No.01/2024/TT-BLDTBXH

Subjects and modules for intermediate and college level can be grouped into 02 groups: *1) General subjects* and *2) Vocational training subjects and modules.*

- *General subjects*: General subjects are designed to provide foundational knowledge and develop skills that build essential competencies for learners. These subjects include *mandatory subjects* prescribed by the MOLISA that apply to all intermediate and college training programs and *general subjects* independently designed by training institutions to align with specific professions. The content, curriculum, and reference materials for mandatory general subjects are developed and issued by the MOLISA.[24] The current list of mandatory general subjects includes[25]:

No	Subject	Studying hours		Credits	
		Intermediate level	College level	Intermediate level	College level
1	English	90	120	3	4
2	Informatics	45	75	2	3
3	Politics	30	75	2	5
4	Law	15	30	1	2
5	National Defense and Security Education	45	75	2	3
6	Physical Education	30	60	1	2
	Total	**255**	**435**	**11**	**19**

Table 3: List of mandatory general subjects/modules

- *Vocational training subjects and modules*: Vocational specialized subjects can be grouped into (1) Basic technical subjects and modules, (2) Specialized subjects and modules, and (3) Advanced specialized/elective modules.

[24] For example: The course content for the Law subject is provided in the Circular No 13/2018/TT-BLDTBXH on 26th September, 2018 regarding Promulgating the Curriculum of Law courses belonging to the general subjects in the intermediate and college level of vocational training progra

[25] Annex 5, Circular No: 01/2024/TT-BLDTBXH on 19/02/2024

The decision to design and develop specialized subjects lies with vocational training institutions. However, when comparing vocational training programs across different institutions within the same profession of training, it is generally observed that the specialized subjects are quite similar, particularly among public training institutions. These similarities can be partly attributed to the provisions of the Law on Vocational Training 2006 (now superseded), which mandated that the training curriculum framework be developed and issued by the MOLISA. As a result, for a long period, institutions offering the same vocational training programs were required to adopt the same curriculum framework. Only after the Law on Vocational Education 2014 came into force, institutions have more autonomy to design training curricula to meet their training priorities. For example, with the occupation of industrial electricity, we have reviewed three vocational training curriculums provided by three different institutions, namely Hanoi Vocational College of Technology (HATECH), Bac Ninh College of Industry (BCI), and Vietnam-Korea College in Binh Duong. Our comparison shows that HATECH allocates more hours to theory learning than BCI and Vietnam-Korea College. Given that HATECH is under Hanoi University of Science and Technology, HATECH is expected to be more theory-focused than the other two institutions. Meanwhile, Vietnam-Korea College requires students to be able to use English in research guidelines, read technical maps, or be able to work in groups. Hence, they provide an additional 75 credits for advanced English (along with 120 credits for basic English as required by the MOLISA) and 30 credits for the Soft skills module.

Below are some comparative examples of vocational training programs for the occupation of industrial electricity from four training institutions (see Annex 2 for detailed curriculum).

Occupation: Industrial Electricity

Occupation code: 6520227

Education level: College

Eligibility: High school graduate or equivalent

Institution 1: Hanoi Vocational College of Technology[26] (Vocational training curriculum implemented for the 2021 enrollment)

Hanoi Vocational College of Technology (HACTECH) was established on April 23, 2009, belonging to the Hanoi University of Science and Technology - the leading university of science and technology in Vietnam). HATECH also connected with international partners to provide training programs that meet international standards, for instance, FIVE projects, which is a cooperation

[26] *Hanoi Vocational College of Technology, available at:* https://www.hactech.edu.vn/tin-tuc/chuong-trinh-dao-tao/quyet-dinh-ban-hanh-chuong-trinh-dao-tao-va-ke-hoach-hoc-tap-he-cao-dang-dap-ung-chuan-dau-ra-cua-bo-lao-dong-thuong-binh-xa-hoi-nghe-ap-dung-tu-khoa-13-tuyen-sinh-nam-2021-1626941079.html#title-container

between HATECH and the National Academy for Training and Human Resources Development Landsakademie (LAK), Baden - Wurttermberg, Germany, to provide technical engineer training for high school graduates, college graduates, undergraduates or students of HATECH. This program is entirely based on Germany's training curriculum, adhering to German standards, with instruction and assessment conducted by German instructors. The Vietnamese lecturers currently teaching this program have also undergone training provided by the German partner. However, this program is designed to offer vocational certificates from Germany to Vietnamese students, allowing them to work in any country that recognizes these training certifications. The goal is not to send Vietnamese students to Germany for employment.
Below is the list of subjects and modules for industrial electricity occupation provided by HATECH (see annex 2 for detailed subjects and modules)

No	Subjects	Total learning hours	Learning hours	
			Theory	Practice
I	General subjects	480	349	131
II	Vocational training course and modules	2310	900	1410
II.1	Basic technical subjects and modules	885	465	420
II.2	Specialized subjects and modules	1425	435	990
	Total	**2790**	**1249**	**1541**

Table 4: List of subjects and modules for industrial electricity occupation provided by HATECH

Institution 2: Bac Ninh College of Industry (BCI) (Vocational training curriculum implemented for 2019 enrollment)[27]

Bac Ninh College of Industry (BCI) is one of the leading vocational training institutions in Bac Ninh province - a hub of manufacturing in the north of Vietnam with 16 concentrated industrial parks approved by the Prime Minister.

[27] BacNinh College of Industry, available at <https://bci.edu.vn/chuong-trinh-dao-tao-trinh-do-cao-dang-nganh-dien-cong-nghiep.html >

Below is the list of subjects and modules for industrial electricity occupation provided by BCI (see annex 2 for detailed subjects and modules)

No	Subjects	Total learning hours	Learning hours		
			Theory	Practice	Test
I	General subjects	435	157	255	23
II	Vocational training course and modules	2765	804	1830	131
II.1	Basic technical subjects and modules	390	174	179	37
II.2	Specialized subjects and modules	2375	630	1651	94
	Total	**3200**	**961**	**2085**	**154**

Table 5: list of subjects and modules for industrial electricity occupation provided by BCI

Institution 3: Vietnam- Korea College (Vocational training curriculum issued in 2021)[28]

Vietnam-Korea College in Binh Duong was established in Decision No. 648/QD-LDTBXH dated May 08, 2017, a public institution under the control of the People's Committee of Binh Duong Province - the most significant industrial zone in the south of Vietnam. The Vietnam-Korean College was established with the vision of being an advanced institution in vocational training that marks the cooperation between the government of Vietnam and Korea.

Below is the list of subjects and modules for industrial electricity occupation provided by the Vietnam-Korea College (see annex 2 for detailed subjects and modules)

No	Subjects	Total learning hours	Learning hours		
			Theory	Practice	Test
I	General subjects	435	157	255	23

[28] Vietnam-Korea Binh Duong College, available at <https://viethanbd.edu.vn/Media/6/files/H%E1%BB%93%20s%C6%A1%20n%C4%83ng%20l%E1%BB%B1c/Ch%C6%B0%C6%A1ng%20tr%C3%ACnh%20%C4%91%C3%A0o%20t%E1%BA%A1o%20ngh%E1%BB%81%20%C4%90i%E1%BB%87n%20c%C3%B4ng%20nghi%E1%BB%87p%20-%20Cao%20%C4%91%E1%BA%B3ng.pdf>

II	Vocational training course and modules	2150	658	1411	81
II.1	Basic technical subjects and modules	615	285	295	35
II.2	Specialized subjects and modules	1535	373	1116	46
	Total	**2585**	**815**	**1666**	**104**

Table 6:List of subjects and modules for industrial electricity occupation provided by the Vietnam-Korea College

Institution 4: Hanoi Vocational College of High Technology (HHT)[29]

Hanoi Vocational College of High Technology is a vocational institution established by the Hanoi People's Committee and is one of the leading vocational training institutions in Hanoi. It is also one of the selected institutions to implement a pilot international training program in Automotive Technology, transferred from the Federal Republic of Germany. Currently, HHT is developing with a focus on strong ties to businesses, not only providing services to develop and produce technical products for enterprises but also training students and directly supplying labor to businesses. This development orientation has allowed HHT to receive significant support from both domestic and international businesses. For instance, the tuition fees for students in some fields, such as Electrical Engineering, are supported 70% by the government and 30% by businesses. Additionally, students have the opportunity to directly participate in the design and production processes for businesses. Recently, the Hanoi People's Committee decided to invest 50 billion VND in purchasing and equipping modern devices from the Festo Group for training purposes at the college, which contributes to modernize HHT's training facilities and catch up with current market needs.

HHT's industrial electrical engineering program includes the following modules: (1) Mandatory general subjects as per MOLISA regulations; (2) Basic subjects; (3) Specialized subjects in the field; and (4) Graduation internship.[30]

Graduates of the Industrial Electrical Engineering program at HHT will be awarded various certificates, including: (1) Occupational safety and industrial hygiene (5S); (2) Basic electrical profession; (3) Installation of domestic electrical systems; (4) Installation of industrial electrical

[29] Hanoi Vocational College of High Technology, available at: <https://hht.edu.vn/ >

[30] Hanoi Vocational College of High Technology, available at: <https://hht.edu.vn/nganh-hoc/gioi-thieu-nghe-dien-cong-nghiep/>

systems; (5) Installation and control of smart electrical systems; (6) PLC programming; and (7) Automation.

Regarding green content, HHT offers a module on Occupational Safety and Industrial Hygiene, which provides knowledge about the 5S system - a workplace organization method originating in Japan aimed at improving efficiency, productivity, and safety through systematic processes, in addition to the green components as learned from the GIZ's model. The name 5S derives from five Japanese words:

- Seiri - Sort: Remove unnecessary items from the workplace
- Seiton - Set in Order: Organize tools and equipment in a logical manner for easy access
- Seiso - Shine: Keep the workspace clean and tidy to maintain safety and efficiency
- Seiketsu - Standardize: Establish standards for maintaining organization and cleanliness.
- Shitsuke - Sustain: Instill discipline to consistently follow and maintain the 5S practices.

It was mentioned during our interview with HHT that 5S is incorporated as an element of green mainstreaming because demanding partners, including those from Germany, usually favor Japanese laborers whose vocational training embeds 5S.

2.4. Elementary-level Training Curricula

a) Structure of curriculum
- Occupation name
- Eligibility
- Description of the training program and objectivity
- List of subjects and modules, number of credits
- Volume of knowledge, occupational competency, other competencies, autonomy, and responsibilities.
- Course duration including total time for the course, time allocated for self-study, time for theory-learning, time for practice, internship, time for mid-term test, and final test.
- Process of training, qualification for graduation
- Assessing method and ranking
- Instructions for the utilization of training programs.

Examples of curriculum for the elementary level are as follows:

Institution 1: Bac Ninh College of Industry[31]
- Occupation: Industrial Electrics

[31] BacNinh College of Insdustry (BCI), <https://bci.edu.vn/chuong-trinh-dao-tao-trinh-do-so-cap-nganh-dien-cong-nghiep.html>

- Training level: Elementary level 1
- Eligibility: From 15 years old
- Number of modules: 05
- Number of credits: 14
- Training duration: 03 months

No	Subjects	Total credits	Total learning hours	Learning hours		
				Theory	Practice	Test
	Electrics-Electronics measurement	3	45	15	24	6
	Electrical tools	2	45	15	24	6
	Household electrical appliances	3	75	15	52	8
	Electric equipment 1	3	75	15	51	9
	Electric equipment 2	3	75	15	52	8
	Total	**14**	**315**	**75**	**205**	**35**

Table 7:List of subjects and modules for industrial electricity occupation at the elementary level provided by BCI

III. Greening Technical and Vocational Training Program.

According to the International Labour Organization, green jobs are decent jobs that contribute to preserving or restoring the environment, be they in traditional sectors such as manufacturing and construction, or in new, emerging green sectors such as renewable energy and energy efficiency."[32] This definition is also referred to in Vietnam's National Green Growth Strategy for the 2021-2030 strategy.[33] Accordingly, all jobs can be green or become green jobs regardless of final productions as long as they contribute to the improvement of effective use of energy and reduction of carbon emissions. With the low-carbon transition of economies, there will be the emergence of new skilled occupations and the greening of existing jobs.

[32] International Labour Organization, <https://www.ilo.org/resource/article/what-green-job#:~:text=Green%20jobs%20are%20decent%20jobs,renewable%20energy%20and%20energy%20efficiency.>

[33] Annex, Decision No.1658/QD-TTg dated October 1, 2021 on Approval for National Green Growth strategy for the 2021-2030 period, with the vision by 2050

With this approach, it is crucial to incorporate the knowledge of environmental protection and sustainability or green skilss[34] into vocational training education. This could be done by comprehensively applying five dimensions: green campus, green curriculum, green community, green research, and green culture.[35] It could be observed that some vocational training institutions have started with a "green campus" by growing more trees, creating more green space, requiring learners to be more water-saving, or introducing recycling methods, etc. Generally, vocational education in Vietnam has been greening at different levels. However, the center of greening vocational training education should be placed on the "green curriculum" to provide and prepare learners with skill training, raising environmental awareness and climate literacy. After reviewing current regulations and several vocational training programs (for the industrial electricity sector), it is more likely that green skills and environmental issues have not been paid enough attention, even though green vocational training education has been publicly discussed in several workshops held by vocational training institutions. No required competencies related to green skills or sustainable development are mentioned in related regulations or reviewed vocational training curriculums. This does not necessarily mean that classrooms do not discuss green skills or environmental issues. However, it might not be enough since it would depend entirely on whether teachers bring up these topics in class and students tend to perceive green skills as optional rather than mandatory.

For the time being, the greening vocational training curricula in Vietnam are more likely to focus on occupations that relate directly to environmental issues, such as garbage and recycling collectors, eco-tourism, agricultural and food products processing, etc, rather than promoting all occupations to be green. The greening process of curricula is also observed in technical sectors at certain level. Green content is specifically integrated into the curriculum of the technical sector, with a primary focus on guiding students to use energy efficiently and sustainably. For the green transition of vocational training curriculums, it is necessary to 1) Investigate labor market needs and demands, 2) Consider the environmental sustainability aspects of jobs, and 3) Match those needs with the existing curricula to identify the gaps and decide how best to fill them. Morever, as reflected in our in-depth interviews, while institutions are interested in developing green contents, they still (i) wait for compulsory policy frameworks, (ii) rely on direct support from foreign actors such as GIZ, UNDP, and (iii) only find incentives when it is clear that greening vocational training will be considered a comparative advantage in the evaluation of partnerships by important stakeholders like foreign investors, companies, governments.

[34] Green skills refer to the abilities, values and attitutdes people need to build and support a sustainable and resource efficient society and manifest themselves in the technical skills and knowledge needed by a workforce

[35] BMZ, GIZ, MOLISA (2018), "Greening TVET", 15, <https://www.tvet-vietnam.org/wp-content/uploads/2021/03/Greening-TVET-brochure.pdf>

Within the scope of this report, some recommendations on knowledge and skills regarding environmental sustainability for vocational training lessons and how to incorporate them into current curricula will be provided.

3.1. Required Skills for Green Jobs

To the best of our knowledge, there is no universal definition of "green skills". Regulations regarding vocational training in Vietnam take a comprehensive approach while defining required competencies for students to achieve as "knowledge, skill, attitude, occupational responsibility and ability to apply knowledge in problem-solving". Hence, this report suggests defining green skills as "knowledge, abilities, values, and attitudes needed to live in, develop and support a sustainable and resource-efficient society" when developing projects with Vietnamese vocational training partners.[36]

Thus far, "green skills", regardless of definition, have not been studied to be incorporated into Vietnamese vocational education at all levels. Besides, for the time being, there also is no effective mechanism for green labor market forecasts in Vietnam. However, international organizations, along with private corporations, have been mentioning "green skills". Some private corporations in Vietnam even provide internal learning courses regarding green skills to reskill and upskill their workforce. For example, the True Happiness Group provides internal training courses for employees about waste classification at source, greenhouse gas inventory, or plastic and plastic waste pollution. Among international organizations, the ILO[37] has classified skills as technical skills and core/soft skills and mapped the main core skills required for green jobs across the labor force as follows:

- Environmental awareness and protection; willingness and capability to learn about sustainable development
- Adaptability and transferability skills to enable workers to learn and apply the new technologies and processes required to green their jobs
- Teamwork skills reflect the need for organizations to work collectively on tackling their environmental footprint;
- Resilience to see through the changes required
- Communication and negotiation skills to promote required changes for colleagues and customers

[36] United Nations Industrial Development Orginzation, available at: <https://www.unido.org/stories/what-are-green-skills>

[37] ILO (2019), *Skills for greener future*, available at <https://www.ilo.org/sites/default/files/wcmsp5/groups/public/%40ed_emp/%40ifp_skills/documents/publication/wcms_709121.pdf>

- Entrepreneurial skills to seize the opportunities of low-carbon technologies and environmental mitigation and adaptation
- Occupational safety and health (OSH)

Green skills can also be classified as green technical skills and green transversal skills.[38] Technical skills are required skills to "*adapt, implement standards, processes, services, products, and technologies to protect ecosystems and biodiversity and to reduce energy, materials, and water consumption*"[39]. Green transversal skills can be conceived as job and life skills. These are generic green skills that are based on a sustainability mindset and can be applied across sectors, such as problem-solving, system thinking, and critical thinking. In addition to green transitioning, digitalization should also be simultaneously taken into consideration when it comes to soft skills. In the context of digitalization, working in the digital environment or smart factories where humans share their work with robots and are the final decision makers, analyzing, evaluating, and interpreting information and the environmental impacts of their decisions might be the top priority skills.

Green jobs are diverse. Particular roles require specific technical and soft skills. For example, vocational training programs for the energy sector and manufacturing sectors are as follows:

Energy sectors			
Vocational training level	**Key environmental issues**	**Technical skills**	**Soft skills**
College level	- Accounting for three-quarters of total global greenhouse gas (GHG).[40] - Land use changes (windmills, solar panels) - Pollution of air (harmful substances enter the atmosphere through chimneys, slag transported to ash dump), soil	- Technical knowledge for the application of energy-efficiency measures - Technical knowledge of the application of renewable energy technologies. -Upgraded skills for emergent markets;	- Environmental awareness and protection - Analytical skills, - Critical thinking - Teamwork -Self-regulate skills, -Innovation - Communication

[38] ADB Briefs, available at <https://www.adb.org/sites/default/files/publication/916561/adb-brief-262-workforce-low-carbon-economy.pdf>

[39] ADB Briefs, available at <https://www.adb.org/sites/default/files/publication/916561/adb-brief-262-workforce-low-carbon-economy.pdf>

[40] The International Energy Agency (IEA)

	(geothermal power plants and biomass plants,) and water during the construction and operation phases of energy projects.		-Negotiation abilities -Budgeting -Scheduling -Adaptability and transferability skills
Intermediate level		- Technical knowledge for the application of energy-efficiency measures - Technical knowledge of the application of renewable energy technologies. -Upgraded skills for emergent markets;	-Environmental awareness and protection -Analytical skills, -Teamwork Self-regulate skills, -Communication -Scheduling -Adaptability and transferability skills
Elementary level		- Being able to apply energy-efficiency measures - Being able to use applications of green technologies.	-Environmental awareness and protection -Self-regulate skills, -Teamwork -Communication -Adaptability and transferability skills

Table 8: Green skills for the energy sector

Manufacturing sector			
Vocational training level	**Key environmental issues**	**Technical skills**	**Soft skills**
College level	Extraction of raw materials and resources Production of goods with low value and short life cycles.	Raw material collection Production: Energy-efficient electrical systems (renewable energy integration, consuming	Environmental awareness and protection Analytical skills, Teamwork

	Inefficient energy consumption (electricity, water consumption) and wastage contribute significantly to carbon emissions	less electricity), low-carbon technologies application. Sustainable crafts/business and product development	Innovation Communication Negotiation abilities Budgeting Scheduling Adaptability and transferability skills
Intermediate level		Raw material collection Production: Energy-efficient electrical systems (renewable energy integration, consuming less electricity), low-carbon technologies applications. Sustainable crafts/business and product development	Environmental awareness and protection Analytical skills, Teamwork Communication Scheduling Adaptability and transferability skills
Elementary level		Raw material collection Production: Energy-efficient electrical systems (renewable energy integration, consuming less electricity), low-carbon technologies application. Sustainable crafts/business and product development	Environmental awareness and protection Teamwork Communication Adaptability and transferability skills

Table 9: Green skills for the *manufacturing sector*

3.2. Ways to Incorporate Green Skills into Current Curriculum

It is suggested that climate change should be taught as a mindset across sectors. It is necessary to incorporate environmental issues and green skills into the current curriculum of the vocational training centers. The aims are to raise learners' awareness of climate change, promote actions in their daily lives, and work with environmental protection in mind. Lessons can be designed with specific objectives that by the end of all sessions, learners will: 1) Grasp the science behind climate change, including its causes, impacts, and solutions; 2) Identify how green skills can

mitigate climate changes; 3) Develop climate-resilient strategies within their vocational disciplines.

Ways of incorporation	Description	Advantages	Disadvantages
Short-term course	Short-term courses enhancing green skills could be designed as certificate training courses, such as Corporate social responsibility courses, which provide	- More specialized and allow students to spend more time studying and exploring the topics - Teachers have more space to be creative in lesson design. - Certification can be a big add-on for students' job application	It can be time-consuming to develop a whole new certificated course. The number of enrollments will depend mainly on the tuition fee.
Developing a new subject/module (diffusion model)	A new module can provide a comprehensive view of sustainable development and climate change. This module can be designed to allow students to view sustainable development and climate change from different perspectives, such as: Chapter 1: Introduction to sustainable development. This chapter provides a definition and presents real-world challenges as well as the impacts of climate change. Chapter 2: Law on environmental protection. This chapter allows students to explore	- Students have more time to study and explore related topics. - A stand-alone module as a general module can be applied widely for all vocational training programs and is feasible for students at the intermediate and college levels.	It can be time and money-consuming to develop a new subject.[41] This new module will take up at least 2 credits, which might lead to reduced credits in other modules or more tuition fees that students must pay equivalent to the additional credits.

[41] For further reference, please consult with implementation guidelines of the digital literacy module at: https://www.tvet-vietnam.org/wp-content/uploads/2023/11/230920-Chương-trình-MD-NLS-Full-EN.pdf

	national regulations and international agreements. Chapter 3: Corporate Social Responsibility This chapter explains the need for corporations to be held responsible for social and environmental problems. Chapter 4: Tackling climate changes This chapter equips students with solutions, especially for individuals to take up, such as efficient energy consumption.		
Incorporating sustainable development into current subjects and modules (infusion model) Suggestion: 3 scenarios of incorporating green elements into (1) general knowledge subjects (such as Law; English; …); (2) genernal technical subjects (such as Occupational Safety and Industrial Hygiene; Environment Protection, Efficient Use of	This requires teachers to develop content on environmental issues, climate change, and sustainable development in their teaching and find the connection of this content to current modules. It can be a general subject such as law or English, or a specialized subject to be incorporated with environmental issues content or both.	- Incorporating sustainable development/climate change content into general subject/module: Currently, in the curriculum of vocational training at the college and intermediate level, compulsory general modules have already been applied, among which green skills and content of sustainable development can be incorporated in the Law module. One way the Vietnamese government has done to raise awareness of	- It might be the fastest way to incorporate climate change content into current curricula, especially if incorporated directly into the Law module however, since the Law module is designed and required by MOLISA. Incorporating climate change into the Law module also require a process of policy advocating. - Incorporate in techincal modules: The incorporation will entirely depend on vocational training insitutions, particularly the

Energy and Resources); (3) vocation-specific technical subjects		corruption is by integrating the content of the Law on Anti-corruption into Law subjects of all educational levels. Once climate change content is incorporated into the Law module, every vocational training program in Vietnam will implement it (except for the elementary level). - Technical modules: Incorporating green elements into technical modules can pose less procedural challenges since the vocational institutions have the autonomy to adjust current modules.	teaching departments.
Extracurricular activities or weekly school assembly	Environmental education can be incorporated into the current curriculum of vocational training programs by designing extracurriculars. Students can take part in field trips/outside learning activities regarding environmental protection. These activities can provide them with hands-on experience and active participation.	This can be the easy way since extracurricular activities can be developed and conducted by students' clubs, the Students Union, Ho Chi Minh Communist Youth Union. It can also be designed as a part of certain modules (general modules or specialized modules).	Extracurricular activities can be an ineffective way of learning if it is not designed carefully and interestingly. Students might not take extracurriculars seriously. Hence, Students' attendance in these extracurriculars should be counted as extra points for their

		Since extracurricular activities are informal curricula, there is more space for teachers to be creative in teaching methods. Incorporating climate change into extracurricular activities or weekly school assemble is feasible for students at all levels, especially students at the elementary level which has only three months to a year for course duration.	overall study performance.

Table 10: Comparison of ways of incorporating green skills into curricula

Currently, in the technical vocational education sector, the greening process is specifically integrated into the curriculum, with a primary focus on guiding students to use energy efficiently and sustainably. The College of Mechanics and Irrigation (VCMI), with the support of the "Reform of TVET in Vietnam" Program and the General Directorate of Vocational Education and Training, has revised the module "Environment Protection, Efficient Use of Energy and Resources"[42] for widespread adoption across the system. This module, designed with 36 hours of training, equips vocational students with essential green skills across multiple industries, fostering sustainable lifestyles and approaches to work.[43] This module has been introduced and implemented in the curriculum of several colleges. For instance, at Hanoi Vocational College of High Technology, the content of the "Environmental Protection, Efficient Use of Energy and Resouces" module is incorporated into the Occupational Safety and Industrial Hygiene module. Similarly, HATECH is currently revising the Energy Conservation module to focus on renewable energy use education.

[42] Module "Environment Protection, Efficient Use of Energy and Resouces", available at https://www.tvet-vietnam.org/wp-content/uploads/2023/04/221130-Green-Module-VN.pdf

[43] Vietnamese - German Technical College of Ha Tinh, available at <https://vdht.edu.vn/ky-niem-20-nam-thanh-lap-truong/xanh-hoa-dao-tao-nghe-trong-gdnn-tai-viet-nam.html>

It is also possible that dual-degree and/or Internationally Collaborative Training Programs can also be an effective strategy to incorporate green vocational skills into current vocational training curricula in Vietnam. Such cooperation can substantially enhance the green skills of Vietnamese workers if they gain exposure to green technologies and receive systematic training that allows them to apply these skills when working abroad. Moreover, for training collaborations at vocational schools, fully transferred programs from countries like Germany ensure that green standards are applied at vocational institutions in Vietnam through mutual agreements. If the foreign curricula already provide modules that have green content, they can be implemented directly in Vietnam through dual-certification training programs without being subject to the mandatory regulations outlined in Circular No.01/2024/TT-BLDTBXH.[44] Foreign training programs can also be fully transferred to and implemented by vocational training institutions in Vietnam upon the decisions of the heads of Vietnamese institutions.[45] However, if the Vietnamese institution lacks the field of study required by the foreign partner, the introduction of new disciplines must follow the approval process as stipulated. These new fields must be listed in the Level-IV Vocational Training Directory.[46] If foreign curricula do not provide modules that have green content, as mentioned above, some Vietnamese vocational training institutions have already established modules related to green skills, which can be adjusted flexibly at a certain level to meet both parties' needs. A new module can also be added to the current set of modules without procedural challenges. The next chapter will explore more about international cooperation in labor development in Vietnam.

[44] Article 2 (2), Circular 01/2024/TT-BLDTBXH

[45] Article 6 (3), Circular 01/2024/TT-BLDTBXH

[46] List of Fields and Professions for Level IV Training at Intermediate and College Levels issued under Circular No.26/2020/TT-BLDTBXH dated December 30, 2024.

Sample lesson

1. Target audience: Intermediate-level students in Industrial Electrical Engineering

2. Learning outcomes:

- Knowledge: Evaluated through written tests, multiple-choice questions, or a combination of both
    - Describe and explain the concept of climate change
    - Present and analyze the causes of climate change
    - Describe the global and local impacts of climate changes
    - Describe the contribution of the industrial electrical engineering sector to climate change
    - Present and analyze solutions to mitigate climate change
    - Outline the sustainable development goals
- Skills: Evaluated through group assignments:
    - Be able to apply sustainable practices in the sector of industrial electrical engineering
    - Be able to work alone
- Autonomy and Responsibility: Evaluated using observational method
    - Adherence to classroom rules
    - Adequate attendance at class
    - Demonstrating a positive learning attitude, responsibility, and active participation in completing group assignments.

3. Learning materials:

- Computer and projector for presentation
- Papers and markers for group discussions/activities
- Videos that visualize complex concepts

Content	Learning objectives	Suggested learning activities
Topic 1: Introduction to climate change		
● **Climate change:** - **What is climate change?** + Definition + Distinguish between climate and weather	- Understanding and explaining the relationship between global temperature and atmospheric CO2. - Understanding the essential principles of Earth's climate system	- Presentation - Watching YouTuBe videos: https://www.youtube.com/watch?v=2njn71TqkjA - Gamification: Integrating climate simulations and games to teach complex concepts. Such as classroom games like "Carbon Footprint Bingo". - Interdisciplinary learning: Incorporating climate education across subjects: + Creating climate awareness posters + Calculating carbon emissions. - Role-playing and simulations:
- **What are the causes of climate change?** **+** Explain the relationship between global temperature and atmospheric CO2 (greenhouse effect and its amplification by human activities: Fossil fuel combustion, deforestation, and industrial emissions) **+** Provide students with scientific evidence: **(**CO2 Emissions, CO2 Concentrations, Air Temperature, Water Temperature, Ocean Levels, Ocean pH, Glacier Mass Loss, Arctic Sea Ice Melt, Ice Sheet Melt, Hydrate	- Understand and explain the impact of human activities on the environment and climate change; - Understand and explain how the industrial electricity sector can affect the environment and contribute to climate change."	

Content	Learning objectives	Suggested learning activities
Topic 1: Introduction to climate change		
Melting, Growing Seasons, Weather changes, Habitat changes) + Industrial Electrical Engineering and Climate Change: Industrial electrical systems are significant energy users. - **What are the effects/impacts of climate changes (Global impact and local impacts)** + Predictions (scenarios) **+** To Environment: Global warming, rising sea levels, extreme weather events, effects on biodiversity and ecosystems) + To society ● **Climate Change and Sustainable Development Goals** - What are the SDGs?	- Understand the impacts of climate change globally and locally - Understanding how and why people experience climate change impacts differently and how social and cultural contexts shape their capacity to respond - Understand and present SDGs	Role-playing exercises help students understand climate policies and the challenges of reaching agreements. **- Invited guest:** One policy maker will be invited to the class and have a quick talk sharing and discussing climate change and what the Vietnamese government is trying to do to tackle climate change.

Content	Learning objectives	Suggested learning activities
Topic 1: Introduction to climate change		
- Explain goals in detail with examples: Strengthen resilience and adaptive capacity to climate-related hazards and natural disasters in all countries ● **Tackling climate changes** - International cooperations - Corporate social responsibilities - Individual actions: + Energy efficiency: building designs with renewable energy + Sustainable Agriculture: Climate-smart crop practices + Waste Management: Recycling and circular economy practices. - From relevant vocational fields: - + Explain concept of "Green jobs" + Industrial Electrical Engineering: Green technologies: Renewable Energy, Smart grids and energy management systems, the adaptation of LED lighting systems, transition to energy-efficient motors and drives.	- Present solutions that reduce the impacts of human activities on natural systems - Present solutions to complex real-world problems based on prioritized criteria and trade-offs that account for a range of constraints, including cost, safety, reliability, as well as possible social, cultural and environmental impacts. - Understanding what should be done to build community resilience in extreme weather. (How can society respond to	

Content	Learning objectives	Suggested learning activities
Topic 1: Introduction to climate change		
+ Agriculture: Sustainable farming practices + Construction: Green building materials and designs + Engineering/Mechanics: Renewable energy technologies. (Encouraging students to explore green certifications or courses.	climate change in a way that is effective and equitable) - Understanding how individuals/relevant sectors can be active in making climate solutions a reality-	
Outdoor learning (or extracurricular)		Field trips to ecosystems impacted by climate change or visiting factories that have applied green technologies/renewable energy facilities within the regions, give students firsthand experience. Students are required to write

Content	Learning objectives	Suggested learning activities
Topic 1: Introduction to climate change		
		a report after the field trip.
Group activities		*Discussion topic*: 1) What are the impacts that climate change has on Vietnam (e.g. Vietnam's Mekong Delta)? 2) How marginalized communities are disproportionately affected by climate change and the importance of equitable solutions. 3) How can your chosen career field contribute to combating climate change? 4) What can individuals do to mitigate climate change?

Content	Learning objectives	Suggested learning activities
Topic 1: Introduction to climate change		
		What are you willing to do, and what are you not willing to do? 5) Students are divided into groups. Each group is required to design green solutions for their vocational fields. For example, A prototype for energy-efficient housing or sustainable irrigation systems. Presenting their ideas to the class and getting feedback.

Table 11: Sample lesson on climate change content

IV. Cooperation in Vocational Training

International cooperation in vocational training has been strongly promoted in Vietnam. This collaboration takes various forms, including partnerships between vocational training institutions in developed countries and those in Vietnam or through memoranda of understanding (MOUs) signed between the Vietnam government and developed nations. Such initiatives aim to export skilled Vietnamese workers abroad, enhance their expertise, and encourage their return to contribute to national development.

Japan and South Korea are Vietnam's strongest partners in workforce development. These nations have designed programs with several competitive advantages over other labor export and internship initiatives, such as Minimal language requirements, free language training, financial support for training programs, transparent and competitive wage structures, and streamlined visa application procedures.

In vocational education, cooperation models vary significantly depending on the training programs and the parties' specific needs. However, for vocational training collaborations, the choice of the model is primarily determined by the host country's stringent residency regulations.

Additionally, collaborative training programs are expected to enhance the skills of Vietnamese workers, including developing green vocational skills. This can be achieved by applying advanced foreign training programs that integrate green skills directly within Vietnam or by exposing Vietnamese workers and students to green technologies and sustainable practices during their training abroad.

It is also worth noting that the Vietnamese government is undergoing administrative reforms, starting with consolidating and merging ministries to streamline governance. These changes may influence future decision-making processes and administrative procedures related to international cooperation programs.

4.1. International Cooperation between Countries

a) Labor development program between Vietnam and Japan/South Korea

Country-to-country cooperation is believed to leverage the skills of Vietnamese labor as Vietnamese workers are trained while working in developed countries. Some countries that have strong cooperation with Vietnam in providing labor training programs are Japan, South Korea, Canada, Germany, Australia, and Taiwan. Among those, Japan had over 50% of Vietnam's labor export market share in 2018. In the 28th ASEAN Labour Ministers Meeting, Vietnam and Japan agreed to negotiate and sign a ministerial-level Memorandum of Understanding under Japan's

new Employment Law and continue to cooperate in other areas.[47] The most famous working program in Japan is known as the Technical Intern Training Program (TITP), in which host companies from Japan can place job orders with the supervising organization in Japan. The supervising organization will inform the Vietnamese sending organization about the job offers. The sending organization filters candidates to match the job description and supports the signing contract process between selected candidates and host companies. The figure below shows the involvement and connection of stakeholders in the process.

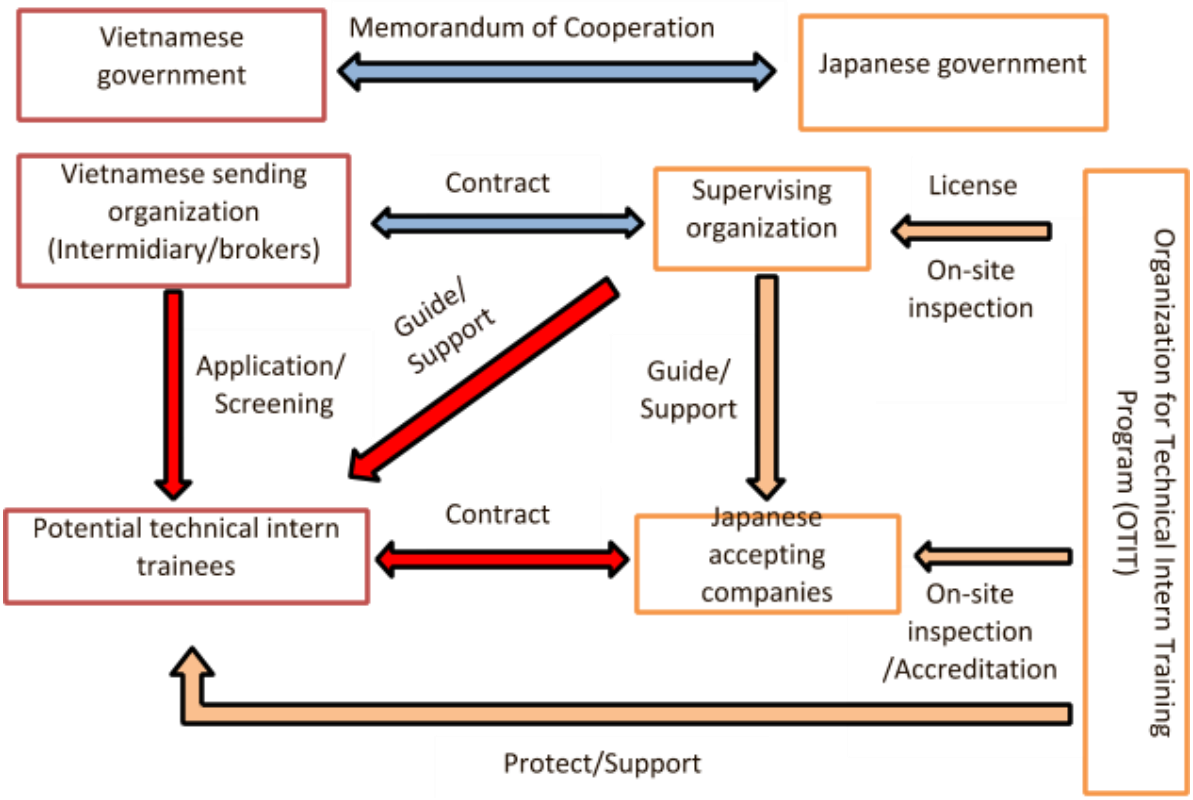

Figure 1: Roles of each stakeholder in the TITP and the relationships between them (Source: Tran, 2020)[48]

Another famous government-to-government program is The Employment Permit System (EPS), which was established to facilitate the recruitment of Vietnamese workers to South Korea under legal and transparent conditions. The table below compares the two working export programs:

[47] The Labour, War Valids and Social Affair, https://www.molisa.gov.vn/baiviet/242316

[48] Bao Quyen Tran (2020), Vietnamese Technical Trainees In Japan Voice Concerns Amidst COVID-19, available at: <https://apjjf.org/2020/18/tran?fbclid=IwZXh0bgNhZW0CMTAAAR2PBlG7baLWXLNu1pp_N-XnnGRySm5c-ErlU5xAyhSYqWk0hps0kOjT-6c_aem_SEhLWcEWq0KQ7dHj1HVIDA>

	Vietnam – South Kora (EPS Program)[49]	Vietnam- Japan (TITP)[50]
Status of Vietnamese	Vietnamese working in Korea is considered a migrant worker.	Vietnamese working in Japan under the Technical intern training program are considered interns (not workers). The purpose of this program is to let foreigners learn Japanese skills while working and utilize them for the development of interns' home countries.
Main industries	Manufacturing Agriculture Construction Fisheries	Vietnamese trainees are mainly hired in 03 industries: Construction (23.3%), Food-related manufacturing (20.6%), and Machinery and metal (18.6%). Other industries are agriculture (7.7%), textiles (6.2%), fisheries (0.5%), and others (2.1%).[51]
Contract duration	The initial contract lasts three years, with the possibility of an extension of up to an additional 22 months if required by the employer.	01 - 05 years As of 2021, 85 types of jobs are available for three-year work and 77 types for five-year work.[52]
Re-entry	Workers may also have opportunities for re-entry under the Employment Permit System.	Technical intern trainees are generally not allowed to return to Japan under the same Technical Intern Training Program once they have completed their training and returned to their home countries. However, there are exceptions if the trainee progresses through different skill levels within the program or is qualified under other specific immigration

[49] Employment Permit System, https://www.eps.go.kr/eo/JobAplct.eo?langCD=ph&menuID=10018&pgID=P_000000036

[50] Japan International Trainee and Skilled Worker Cooperation Organization, available at: <https://www.jitco.or.jp/en/regulation/index.html>

[51] Ministry of Justice, 2020 report, cited in Bao Quyen Tran (2020), Vietnamese Technical Trainees In Japan Voice Concerns Amidst COVID-19, available at: https://apjjf.org/2020/18/tran?fbclid=IwZXh0bgNhZW0CMTAAAR2PBlG7baLWXLNu1pp_N-XnnGRySm5c-ErlU5xAyhSYqWk0hps0kOjT-6c_aem_SEhLWcEWq0KQ7dHj1HVIDA,

[52] https://portal.jp-mirai.org/en/work/s/tech-intern/comprehend-tech-intern

		categories designed for skilled workers.[53] They may be eligible to reapply under advanced levels of the TITP or through the Specified Skilled Worker (SSW) visa, provided they meet the necessary qualifications.
Eligibility	Between 18 years old – 39-year-olds Students or graduates of vocational training programs from the intermediate level. Quân nhân xuất ngũ: từ elemtary level. No criminal record Have never been deported from South Korea If previously resided in South Korea legally or illegally under an E9 ỏ E10 Visa: Residing time is less than five years. Not prohibited from exiting Vietnam No relatives living illegally in Korea. Being qualified for health conditions.	Between 20 years old to 35 years old. Highschool graduates or equivalent level or higher Height: 1.60 meters for males and 1.50 meters for females. Weight: Proportional to height. No tattoos, no physical disabilities, deformities, or scars No vision issues such as myopia, amblyopia, or color blindness. Must meet health standards for overseas work as outlined in Circular No. 14/2013/TT-BYT dated May 6, 2013, issued by the Ministry of Health on health examination guidelines. No criminal record Must not have previously participated in any Japanese technical intern training program. Must have permanent residency and currently live in a locality that is allocated quotas for candidate selection by the MOLISA.
Enrollment process	1. Application 2. Interview and professional test (theoretical and practical test) These interviews and tests are organized and evaluated by the Korean Human Resouce Development Agency (HDR Korea) The cost of vocational training and skill testing ranges from 9 to 10 million VND per person. 3. Korean language course	1. Application 2. Testing The Center of Overseas Labour will collaborate with the Vietnam Office of IM Japan to organize recruitment exams for applicants who meet the required criteria. The exam includes: - Mathematics test

[53] Japan International Training Cooperation Organization (JITCO), Technical Intern Training Guidebook for Technical Intern Trainees, available at <https://www.jitco.or.jp/download/data/guidebook_english.pdf>

	Candidates who pass the interview and professional test will attend a language course. The Korean language course fee is approximately 3.2 million VND per person. 4. Language Examination Upon completing the language course, candidates will take the EPS-TOPIK Korean proficiency test on computers, requiring a minimum passing score of 80 out of 200. Candidates may attempt the test twice, with the highest score recognized as their official result. The cost for tests is equivalent to 28 USD in VND. 4. Application for recuirement Candidates who pass the Korean proficiency test can submit applications for recruitment by South Korean employers. Upon signing contracts and relocating to South Korea, successful candidates must pay a deployment fee equivalent to 630 USD in VND and deposit 100 million VND with the Social Policy Bank as mandated under the EPS program. 5. Signing employment contract - Candidates who Korean employers recruit will sign labor contracts with Korean employers and EPS Program contract with the Canter of Overseas Labour 6. Deposit 7. Working in Korea 8. Terminate the contract and return to Vietnam.	- Physical fitness test (3,000-meter run, 35 push-ups, and 25 sit-ups) - Interview Bonus points will be given to candidates who are qualified simultaneously under two conditions: (1) Get at least 30 points for the Mathematics test and (2) who are children of war invalids, martyrs, or recognized contributors of the nations, candidates from poor districts and ethnic minorities. 3. Japanese language and another educational course in Vietnam (often three to six months) 4. Signing employment contracts 5. Orientation and training after arrival The union in Japan provides trainees with lectures on the Japanese language and life in Japan for more than a month. 6. Training period (One to maximum 05 years) 7. Returning home after completing training
Deposit	100 million VND. This deposit (including interest) will be returned if workers complete their contracts and return to their home country on time. Violation, such as overstaying or working illegally, will result in the forfeiture of the deposit.	No requirement
Monthly salary	2,060,740 KRW, equivalent to approximately 38 million VND (1,500 US dollars).	125,000 Yen – 150,000 Yen (approximately 1,300 – 1,500 US dollars)

	(Earnings are subject to fluctuations based on the exchange rate)	An amount of 600.000 Yen per person will be paid upon returning to Vietnam as an incentive.
Total costs	Costs are borne by workers upon selection: - Visa fee, airline ticket, and application and training fee (630 US dollars) - Health checkups	*Costs are borne by workers upon selection:* - Passport, visa fees, and health checkups - Tuition for the initial 3-month preparatory course - Accommodation and meals during the training period in Vietnam - Review courses in the month preceding departure *Costs covered by IM Japan:* - Airfare - Tuition for the 4-month official training course - Vocational training fees Support for priority groups: Workers from poor households or ethnic minorities in underprivileged districts, as the Prime Minister stipulated in Decision No.71/2009/QD-TTg, are eligible for cost coverage per the decision. Workers from poor districts who are not in these categories receive 50% tuition support.

Table 12: Comparison of labor development program between EPS program and Technical intern training program.

The two programs raise common concerns, such as illegal stays or overstays of workers, language and cultural integration, restrictive mobility of workers, and limited protections against exploitation. Migrant workers and trainees are highly restricted and strongly discouraged from changing their employers for the duration of their employment contract. Besides, migrant workers and trainees are subjected to abusive working conditions, including verbal abuse and physical abuse from their employers. Migrant workers' passports and other identity documents are confiscated by the employers in order to keep migrant workers/trainees working for the employers. There are several cases reported regarding the mistreatment of employers under these programs.[54]

[54]Bao Quyen Tran (2020), Vietnamese Technical Trainees In Japan Voice Concerns Amidst COVID-19, available at <https://apjjf.org/2020/18/tran?fbclid=IwZXh0bgNhZW0CMTAAAR2PBlG7baLWXLNu1pp_N-XnnGRySm5c-ErlU5xAyhSYqWk0hps0kOjT-6c_aem_SEhLWcEWq0KQ7dHj1HVIDA>

Besides, Vietnamese sending organizations (intermediaries/brokers/agencies) also face criticism regarding the overcharged fees or even illegal fees Vietnamese students/workers bear that put them into enormous debt. The Vietnamese government issued and implemented the Law on Vietnamese Guest Workers 2020 and other relevant regulations to tackle this issue.[55] Simultaneously, the Department of Overseas Labour (DOLB) has provided a list of Vietnamese enterprises eligible to provide Vietnamese guest workers service as well as published all information regarding these companies whose licenses are suspended, revoked, or under inspection on their website.[56] Besides, the Center of Overseas Labour (COLAB) is established as a public service unit under the MOLISA. It is tasked with recruiting, training, and dispatching Vietnamese workers to South Korea under the EPS program and facilitates the deployment of technical interns and workers in the construction and shipbuilding sectors to Japan through an agreement with IM Japan. It also coordinates the training and placement of Vietnamese workers in the nursing and elderly care sectors in the Federal Republic of Germany.[57] Last but not least, to better support students working overseas, certain vocational training institutions establish a center/department that cooperates with Vietnamese agencies, or in some cases, this center/department partnerships directly with foreign training institutions/foreign employers to send students studying and training abroad.

b) Cooperation involving vocational training institutions

Overall, the parallel training programs conducted in direct collaboration with vocational training institutions currently encompass a wide variety of models, some of which include:

	Training in Vietnam	Vietnamese Certification	Training Abroad	Foreign Certification	Internship/ Work abroad
Model 1	x			X	
Model 2	X	X		X	
Model 3	X	X			X
Model 4	X		X	X	X

Table 13: Different models of cooperation involving vocational training institution

[55] Decree No.12/2022/ND-CP, Decree No.112/2021/ND-CP, Decree 152/2020/ND-CP, Circular No.02/2024/TT-BLDTBXH; Circular No.21/2021/TT-BLDTBXH,

[56] Department of Overseas Labour, available at <https://dolab.molisa.gov.vn/BU/Index.aspx?LIST_ID=1371&type=hdmbmtmn&MENU_ID=246&DOC_ID=1561>

[57] Center for Oversea Labour, available at: https://colab.gov.vn/detail/293/Gioi-thieu-chung.aspx

Typically, the choice of model is primarily determined by the needs and capabilities of foreign partners. Current dual-degree training programs in collaboration with Germany generally follow either Model 1 or Model 2. In these models, students are entirely trained under Germany's vocational education curriculum, with German instructors providing guidance and evaluation, culminating in a German-issued diploma. These programs are primarily designed to develop a skilled workforce for German enterprises operating in Vietnam, adhering to certifications and standards recognized by the Federal Republic of Germany. Consequently, within the framework of the collaboration, there are no binding provisions guaranteeing labor exchange opportunities for students to work in Germany.

The Hanoi Vocational College of Technology (HATECH) under the Hanoi University of Science and Technology, in partnership with the Landesakademie (LAK) for Vocational Training and Human Resource Development in Baden-Württemberg (Germany), implementing the Technical Engineer Diploma program in Electrical Engineering.[58] This program awards a diploma recognized by the Federal Republic of Germany. Students undergo two years of training under the HATECH's curriculum and two additional years under Germany's international practical engineering program in electrical engineering, receiving dual certifications. The two years under Germany's international practical engineering program can also be provided independently for applicants who are not HATECH students but want to earn a technical engineering diploma. Graduates are qualified to work in any country or company recognizing Germany's vocational engineering standards. Notably, nearly 10 graduates have met the B1-level German language requirements and independently secured employment in German.

To provide vocational training for Vietnamese workers preparing for employment abroad, Model 3 and Model 4 have been implemented at various vocational training institutions. These Models are often applied in collaborative programs with Japanese or South Korean partners. Students can complete their training in Vietnam, receive a diploma, and then apply for work programs in South Korea or internship in Japan (Model 3). Some programs issue diplomas exclusively from the foreign partner (Model 4), with students staying abroad for internships or work to simplify the associated administrative procedures. For example, when both parties issue diplomas (dual certification), the training programs in both Vietnam and the foreign country must meet regulatory standards and be accredited by the respective national authorities. In Vietnam, implementing dual-degree programs requires authorization from the Department of Formal Education (under the General Directorate of Vocational Education and Training). To enhance flexibility, some programs involve 1-2 years of training in Vietnam, followed by exchange programs where students continue studying in the partner country and earn a diploma from a

[58] Hanoi Vocational College of Technology, available at <https://www.hactech.edu.vn/tin-tuc/du-an-five#title-container>

foreign institution (Model 4). A prerequisite for such programs is that the foreign institution must recognize the Vietnamese institutions' curriculum, and students might have to defer their training course in Vietnam to formalize their training abroad

The choice of model depends heavily on the needs and preferences of both parties but is often influenced by the requirements of foreign partners. Sending students abroad for training, practice, or employment (Model 3 and Model 4) frequently encounters procedural challenges in the host country, such as immigration policies and the need for specific visas tailored for students. Furthermore, the admission of Vietnamese workers to live and work in a host country necessitates the development of comprehensive social welfare policies and the establishment of management systems that support their integration. This is particularly important in partner countries with significant cultural and social differences. As a result, many current cooperation programs implement dual-certification training, ensuring that students meet the professional standards of both countries. However, the decision to work abroad is entirely up to the students, with no binding commitments. That being said, if the primary goal of the program is to provide vocational training specifically for Vietnamese workers to work abroad, Model 4 offers a more streamlined and simplified process compared to dual-certification programs.

One important thing should be noted: regulatory procedures for this dual program are expected to change shortly. The Vietnamese Government is restructuring administrative systems, with the MOLISA being merged with the Ministry of Home Affairs to form the Ministry of Home Affairs and Labor. The General Directorate of Vocational Education and Training, currently under the MOLISA, is expected to transition to the Ministry of Education and Training. Consequently, changes to the organizational and administrative procedures related to vocational education are anticipated in 2025.

Key considerations for Building bilateral vocational training programs between countries:

- **Streamlined Procedure**: For programs involving the exchange and deployment of students, interns, or workers abroad for training and employment, the process for student/intern/worker exchanges must be simplified and expedited. This requires the establishment of a simple but effective legal system supporting the residence, working, and social welfare of Vietnamese students/workers in the host countries.
- **Language Training**: Programs targeting labor markets in Japan and South Korea have notable advantages due to less stringent language requirements. For example, Japanese language requirements for internships in Japan are primarily determined by the needs of

host companies. Many programs currently offer free language training,[59] and most students face minimal difficulties meeting these requirements. For more challenging languages like German, a minimum B1 proficiency level is required. Achieving this level typically takes eight months to a year of dedicated study. For instance, dual training programs recognized by the Federal Republic of Germany, such as those implemented at HATECH, provide two semesters of Japanese language courses with 90 hours of theoretical instruction. However, even students achieving B1 certification often struggle with German-language interviews, posing a significant barrier to accessing the German labor market. Moreover, because of the nature of the required labor force in Germany, where automation and robotics are widely applied, highly skilled technical engineers would need even B2 level for sufficient work and integration.[60] This demands careful consideration from the German side about their strategic needs for labor imports from Vietnam and subsequent adjustments in recruitment strategies to ensure candidates meet both language and technical requirements.

- **Enhanced Incentives and Support:** Japanese and South Korean collaborative programs offer significant financial and recruitment support. Some programs fully cover tuition fees for students. According to Decree No.81/2021/ND-CP and Circular No.05/2023/TT-BLDTBXH, certain fields, including electrical engineering, electronics, telecommunications, chemical engineering, metallurgy, and environmental technology, are categorized as heavy, hazardous, or dangerous occupations at the intermediate and college levels. Students enrolling in these programs receive a 70% tuition fee subsidy. To take advantage of this policy, some training institutions proactively secure international or corporate sponsorships to cover the remaining 30% of tuition fees. This approach enhances their competitiveness in student recruitment.

- **For direct collaboration with vocational training institutions in Vietnam:** If the goal is to select outstanding students and send them abroad to work in high-quality programs, it is essential to collaborate with reputable and well-established institutions specializing in the relevant training fields. Presently, vocational training institutions in Vietnam primarily admit students based on academic transcripts rather than entrance exams, making it challenging to manage and ensure the quality of incoming students. Therefore, collaborative programs emphasizing student quality should prioritize working with top-

[59] Recruitment Notice for Technical intern training program in Japan, recruited by Hoang Long CMS, Japanese employment receiver: Hi-Line Japan, available at <https://hht.edu.vn/thong-bao-vi/chuong-trinh-thuc-tap-sinh-tai-nhat-ban-tai-tro-100-chi-phi/>

[60] Dan Tri newspaper, available at <https://dansinh.dantri.com.vn/nhan-luc/duc-khat-hon-5-trieu-lao-dong-rong-cua-sang-duc-lam-viec-thu-nhap-cao-20241028230628055.htm>

tier institutions or requiring separate entrance exams specifically for the exchange program.

4.2 Non-government Cooperation Initiatives to Support Greening Vocational Training

To effectively advance the green transition in vocational education, the collective efforts of various stakeholders are essential, including the Vietnamese government, vocational training institutions, international organizations, and business corporations. Vietnam has already benefited from significant financial and technical support for green jobs and green education from international NGOs and organizations. Key initiatives include:

- *BMZ and GIZ - TVET Reform Program (2020-2024)*

In collaboration with the MOLISA, the German Federal Ministry of Economic Cooperation and Development (BMZ) and Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) support the Reform of Technical and Vocational Education and Training (TVET) in Vietnam.[61] The program has worked with vocational training institutions in Vietnam to establish and implement vocational training programs that are dual models, such as Electronics and Building Energy Technology and Mechanical Technology, Heating, and Air Conditioning.[62] Students spend 30% of their time learning theoretical knowledge at the college, while the remaining 70% is devoted to practical training at enterprises. Graduates of these two programs will receive dual certifications: a vocational diploma based on Vietnamese standards and another based on German standards.[63] Within the scope of the Reform of TVET program, one Centre Excellence for Green TVET in Dong Nai Province (The College of Machinery and Irrigation) has been established.

- *International Labour Organization (ILO)*

The ILO has collaborated with Vietnam to integrate green skills into Technical and Vocational Education and Training (TVET). This program is funded and supported by the German Federal Ministry of Economic Cooperation and Development (BMZ) and implemented by Deutsche Gesellschaft fur Internationale Zusammenarbeit (GIZ) GmbH.[64] This program has introduced modules on renewable energy, energy efficiency, and sustainable practices in vocational training institutions.

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[61] Trained in Viet Nam, available at ><https://www.tvet-vietnam.org/

[62] These two vocational training programs are provided by the College of Machinery and Irrigation.

[63] These two vocational training programs are provided by the College of Machinery and Irrigation.

[64] Trained in Viet Nam, availble at <>https://www.tvet-vietnam.org/wp-content/uploads/2021/03/Greening-TVET-brochure.pdf

- *The World Bank and the Asian Development Bank (ADB)*

The World Bank has provided financial support for Vietnam's climate-resilient infrastructure projects, indirectly contributing to green jobs in sectors like renewable energy, sustainable transport, and eco-friendly construction. The WB published a policy note aimed at advancing the understanding of green jobs in Vietnam.[65]
Asian Development Bank (ADB) has assisted with green jobs and green skills studying under ADB Project TA-7879 REG: Education and Skills for Inclusive Growth and Green Jobs in Asia.[66] ADB also has an assistance program for Vietnam for 2024 -2026, focusing on the country's transition to a climate-resilient and sustainable economy.[67]

It is crucial to explore and strengthen partnerships with both local and international organizations to align educational and training programs with the green skills necessary for learners. Collaborative efforts should focus on integrating green modules into curricula, promoting renewable energy technologies, and creating pathways for students to access green job opportunities.

[65] World bank, Green jobs: Upskilling and Reskilling Vietnam Workforce for Greener Economy, available at <https://documents1.worldbank.org/curated/en/099091823063517461/pdf/P1781121e19c8506719ff81042e6be4e00b.pdf>
[66] Le Van Chuong (GDVT/MOLISA), available at <https://events.development.asia/system/files/materials/2014/12/201412-policies-and-practice-can-promote-green-jobs-vietnam.pdf>
[67] Asian Development Bank, available at: https://www.adb.org/sites/default/files/publication/27813/vie-2023.pdf, accessed December 7, 2024

Annex 1: List of Circulars regulating the minimum amount of knowledge and competency requirements for learners of vocational training programs at elementary, intermediate, and college levels.

No	Documents	Industry/Profession
1	Circular No.12/2017/TT-BLDTBXH regulates minimum knowledge volume and required competencies that learners of the vocational training programs at intermediate and college levels must achieve after graduation	Apply to vocational training programs in fields that do not have specialized requirements.
2	Circular No.41/2018/TT-BLDTBXH regulates minimum knowledge volume and required competencies that learners of the vocational training programs at intermediate and college levels must achieve after graduation in the field of press, information, business, and management	Press, information, business, and management
3	Circular No.40/2018/TT-BLDTBXH regulates minimum knowledge volume and required competencies that learners of the vocational training programs at intermediate and college levels must achieve after graduation in the field of art, fine arts, and language	Art, fine arts, and language
4	Circular No.44/2018/TT-BLDTBXH regulates minimum knowledge volume and required competencies that learners of the vocational training programs at the intermediate and college levels must achieve after graduation in the field of computer and information technology	Computer and information technology
5	Circular No.45/2018/TT-BLDTBXH regulates minimum knowledge volume and required competencies that learners of vocational training programs at the intermediate and college levels must achieve after graduation in the fields of architectural engineering technology, construction	Architectural engineering technology, construction engineering, mechanical engineering, electrical engineering, electronics, communications, and chemical engineering.

	engineering, mechanical engineering, electrical engineering, electronics, communications, and chemical engineering.	
6	Circular No.46/2018/TT-BLDTBXH regulates minimum knowledge volume and required competencies that learners of the vocational training program at the intermediate and college level must achieve after graduation in the field of Materials, metallurgy, manufacturing, and other engineering technologies.	Materials, metallurgy, manufacturing and other engineering technologies
7	Circular No.47/2018/TT-BLDTBXH regulates minimum knowledge volume and required competencies that learners of the vocational training programs at intermediate and college levels must achieve after graduation in the field of Mechanical engineering	Mechanical engineering
8	Circular No.48/2018/TT-BLDTBXH regulates minimum knowledge volume and required competencies that learners of the vocational training program at the intermediate and college level must achieve after graduation in the field of Electrical, electronics, and telecommunications engineering.	Electrical, electronics, and telecommunications engineering.
9	Circular No.50/2018/TT-BLDTBXH regulates minimum knowledge volume and required competencies that learners of the vocational training programs at intermediate and college levels must achieve after graduation in the field of Mining engineering and other engineering disciplines	Mining engineering and other engineering disciplines
19	Circular No.52/2018/TT-BLDTBXH regulates minimum knowledge volume and required competencies that learners of the vocational training programs at the intermediate and college	Agriculture, forestry, fisheries, and veterinary science

	levels must achieve after graduation in the fields of Agriculture, forestry, fisheries, and veterinary science	
20	Circular No.54/2018/TT-BLDTBXH regulates minimum knowledge volume and required competencies that learners of the vocational training programs at the intermediate and college level must achieve after graduation in the field of Health and social services	Health and social services
21	Circular No.55/2018/TT-BLDTBXH regulates minimum knowledge volume and required competencies that learners of the vocational training program at the intermediate and college level must achieve after graduation in the fields of tourism, hospitality, sport, and personal service.	Tourism, hospitality, sport, and personal service.
22	Circular No.20/2019/TT-BLDTBXH regulates minimum knowledge volume and required competencies that learners of the vocational training programs at intermediate and college levels must achieve after graduation in the fields of business, management, and law	Business, management, and law
23	Circular No.21/2019/TT-BLDTBXH regulates minimum knowledge volume and required competencies that learners of vocational training programs at intermediate and college levels must achieve after graduation in the fields of computer, information technology, and technical technology.	Computer, information technology, and technical technology.
24	Circular No.22/2019/TT-BLDTBXH regulates minimum knowledge volume and required competencies that learners of the vocational training program at the intermediate and college levels must achieve after graduation in the field of technique	Technique

25	Circular No.23/2019/TT-BLDTBXH regulates minimum knowledge volume and required competencies that learners of the vocational training programs at intermediate and college levels must achieve after graduation in the field of Production, processing, and agriculture	Production, processing, and agriculture
26	Circular No.25/2020/TT-BLDTBXH regulates minimum knowledge volume and required competencies that learners of vocational training programs at intermediate and college levels must achieve after graduation in 90 fields.	

Annex 2: Detailed list of subjects and modules of vocational training program for Industrial Electricity

Institution 1: Hanoi Vocational College of Technology[68] (Vocational training curriculum implemented for the 2021 enrollment)

Subject code	Subjects	Total learning hours	Learning hours	
			Theory	Practice
I	General subjects	480	349	131
	Politics	75	75	0
	Law	30	30	0
	Mathematics	45	45	0
	Informatics	75	15	60
	English 1	60	60	0
	National Defense Education	75	60	15
	Sports	60	4	56

[68] Hanoi Vocational College of Technology, available at <https://www.hactech.edu.vn/tin-tuc/chuong-trinh-dao-tao/quyet-dinh-ban-hanh-chuong-trinh-dao-tao-va-ke-hoach-hoc-tap-he-cao-dang-dap-ung-chuan-dau-ra-cua-bo-lao-dong-thuong-binh-xa-hoi-nghe-ap-dung-tu-khoa-13-tuyen-sinh-nam-2021-1626941079.html#title-container>

	English 2	60	60	0
II	**Vocational training courses and modules**	**2310**	**900**	**1410**
II.1	**Basic technical subjects and modules**	**885**	**465**	**420**
	Introduction to Electric	15	15	0
	Electric Circuit Theory	90	60	30
	Technical Drawing	45	15	30
	Electronics Techniques	60	30	30
	Electrical Drawing	60	30	30
	Mechanical Engineering	45	15	30
	Electric Material and Safety	45	30	15
	Measurement and Sensor	90	45	45
	Hydraulic and Pneumatic Techniques	60	30	30
	Technical English	45	45	0
	Refrigerating and Air-conditioning	60	30	30
	Electrical Machines	120	60	60
	Electrical Apparatus	60	30	30
	Power Electronics	60	30	30
	Cognitive Internship	30	0	30
II.2	**Specialized subjects and modules**	**1425**	**435**	**990**
	Electric Installation	60	30	30
	Impulsion and Digital Techniques	60	30	30
	Electrical Supply	60	45	15
	Programmable Logical Controller	90	30	60

	Electrical Drive	60	30	30
	Professional Practices	90	0	90
	Home Electrical Equipment	60	30	30
	SCADA and Industrial Communication	60	30	30
	Production Organization	30	30	0
	Electric Equipment	90	45	45
	Microcontroller	75	30	45
	Intelligent Control	60	30	30
	Final Practice	210	0	210
	Graduate Project	375	60	315
	Elective subjects (choose 1)	45	15	30
	Power using efficiency	45	15	30
	Industrial maintenance	45	15	30
	Total	**2790**	**1249**	**1541**

Institution 2: Bac Ninh College of Industry (BCI) (Vocational training curriculum implemented for 2019 enrollment)[69]

Module code	Subjects and modules	Credits	Learning time (Hours)			
			Total			
				Theory	Practice/ Intern/ Laboratory/ Discussion	Test
I	**General subjects**	**29**	**435**	**157**	**255**	**23**
MH 01	Politics	5	75	41	29	5
MH 02	Law	2	30	18	10	2
MH 03	Physical Education	4	60	5	51	4
MH 04	National Defense and Security Education	5	75	36	35	4
MH 05	Informatics	5	75	15	58	2
MH 06	English	8	120	42	72	6
II	Vocational training course and modules	**101**	**2765**	**804**	**1830**	**131**
II.1	*Basic technical subjects and modules*	**21**	**390**	**174**	**179**	**37**
MH 07	Labor safety	2	30	17	11	2
MH 08	Electric circuit	4	60	40	16	4

[69] Bac Ninh College of Industry, <https://bci.edu.vn/chuong-trinh-dao-tao-trinh-do-cao-dang-nganh-dien-cong-nghiep.html >

MH 09	Technical drawing	2	30	19	9	2
MH 10	Electrical materials	2	30	20	8	2
MĐ 11	Electric tools	2	45	15	24	6
MH 12	Electrical Drawing	2	30	18	10	2
MĐ 13	Basic Electronics	3	75	15	53	7
MĐ 14	Using hand tools	2	45	15	24	6
MĐ 15	Electrical and Electronic Measurement	2	45	15	24	6
II.2	*Specialized subjects and modules*	**80**	**2375**	**630**	**1651**	**94**
MH 16	Electric Machine 1	3	45	27	15	3
MĐ 17	Electric Machine 2	5	120	30	81	9
MH 18	Power supply	3	45	23	19	3
MĐ 19	Electric drive	2	45	15	24	6
MĐ 20	Home electrical equipment	3	75	15	53	7
MĐ 21	Sensor technology	3	75	15	53	7
MĐ 22	Electro-pneumatic control	4	90	30	52	8
MĐ 23	Electrical Equipment 1	6	150	30	110	10
MH 24	Electrical Equipment 2	3	45	30	12	3

MĐ 25	Electrical installation engineering	5	120	30	81	9
MĐ 26	Power Electronics	3	75	15	53	7
MĐ 27	Basic PLC	4	90	30	52	8
MĐ 28	Advanced PLC	3	75	15	53	7
MĐ 29	Small programmable controller	3	75	15	53	7
MĐ 30	Maintenance of electrical equipment systems for machine tools at enterprises	6	150	30	120	
MĐ 31	Internship	19	875	220	655	
MĐ 32	Graduation project	5	225	60	165	
	Total	**130**	**3200**	**961**	**2085**	**154**

Institution 3: Vietnam- Korea Binh Duong College (Vocational training curriculum issued in 2021)[70]

Module code	Subjects and modules	Credits	Learning time (Hours)			
			Total			
				Theory	Practice/ Intern/ Laboratory/ Discussion	Test
I	**General subjects**	**20**	**435**	**157**	**255**	**23**
MH 01	Politics	4	75	41	29	5
MH 02	Law	2	30	18	10	2
MH 03	Physical Education	2	60	5	51	4
MH 04	National defense and security	4	75	36	35	4
MH 05	Informatics	3	75	15	58	2
MH 06	English	5	120	42	72	6
II	Vocational training course and modules	92	**2150**	658	1411	81
II.1	*Basic technical subjects and modules*	33	615	285	295	**35**
MH 07	Advanced English	4	75	30	40	5

[70] Vietnam – Korea College, available at <https://viethanbd.edu.vn/Media/6/files/H%E1%BB%93%20s%C6%A1%20n%C4%83ng%20l%E1%BB%B1c/Ch%C6%B0%C6%A1ng%20tr%C3%ACnh%20%C4%91%C3%A0o%20t%E1%BA%A1o%20ngh%E1%BB%81%20%C4%90i%E1%BB%87n%20c%C3%B4ng%20nghi%E1%BB%87p%20-%20Cao%20%C4%91%E1%BA%B3ng.pdf >

MH 08	Labor safety – Electrical safety	2	30	25	3	2
MH 09	Electric circuit	4	75	45	27	3
MH 10	Electrical drawing (CAD)	2	30	15	13	2
MĐ 11	Electric tools	3	45	30	12	3
MH 12	Basic electrics	4	90	40	56	4
MĐ 13	Basic manual arc welding	1	30	5	23	2
MĐ 14	Electrical measurement	2	45	15	25	5
MĐ 15	Power Electronics	4	75	30	41	4
MĐ 16	Sensors Technique	3	60	15	43	2
MĐ 17	Manufacturing organization	2	30	20	8	2
MĐ 18	Soft skills	2	30	25	4	1
II.2	*Specialized subjects and modules*	**80**	**2375**	**630**	**1651**	**94**
MĐ 19	Electrical Installation engineering	4	90	30	57	3
MĐ 20	Electro-pneumatic control	4	90	30	55	5
MĐ 21	Electric machine 1	8	180	45	127	8
MĐ 22	Electric machine 2	2	45	15	25	5
MĐ 23	Power supply	4	60	45	12	3

MH 24	Electrical equipment 1	7	165	45	114	6
MĐ 25	Electrical equipment 2	3	45	30	13	2
MĐ 26	Basic PLC	4	90	30	56	4
MĐ 27	Advanced PLC	3	75	15	56	4
MĐ 28	Small Programming - Smart home control	6	120	45	71	4
MĐ 29	Intern/project	5	215	14	200	1
MĐ 30	Intern for graduation	9	360	29	330	1
	Total	**112**	**2585**	**815**	**1666**	**104**