BAO LOC TECHNOLOGY JOINT STOCK COMPANY

SECOND NARRATIVE REPORT

PROJECT TITLE: "ENERGY EFFICIENCY INNOVATION WINDOW - VIETNAM ROUND

DEVELOPMENT OF 8 KEY NATIONAL STANDARDS FOR E-VEHICLE CHARGING INFRASTRUCTURE".

GRANT NUMBER: ETP/VIE/EEIW-6/2023

PROJECT INFORMATION AND RESOURCES

Project title:	**ENERGY EFFICIENCY INNOVATION WINDOW - VIETNAM ROUND** **Development of 8 key national standards for e-vehicle charging infrastructure**
Grantee Name:	**Bao Loc Technology Joint Stock Company**
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Project Starting date	**Project completion date**	
	Originally planned	Current estimate
18 May 2023	**14 July 2024**	**30 September 2024**

Approved Total Budget (US$)	**Latest Signed Amended Budget (US$)**
US$ 157.605	**N/A**

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I. Executive summary

1. Background

In July 2022, Vietnam's Deputy Prime Minister Le Van Thanh approved a comprehensive plan to reduce emissions in the transportation sector as part of Vietnam's commitments at COP26. The strategy, extending through 2050, prioritizes phasing out fossil-fueled vehicles and expanding electric vehicle (EV) infrastructure nationwide. Starting in 2030, the import and manufacture of fossil-fueled vehicles will cease, with the goal of transitioning all vehicles to green energy sources by 2050.

Funding for these initiatives will be sourced from the state budget, international investments, and public-private partnerships, totaling an estimated VND 3 quadrillion (US$128 billion), approximately half of Vietnam's 2020 GDP. International organizations such as AFD, ADB, World Bank, and HSBC have expressed interest in supporting this shift towards sustainability, aligning with global investment trends favoring green projects.

The policy also emphasizes enhancing international cooperation to establish global standards for green transportation and sharing technological advancements. Key stakeholders, including local firms like VinFast, stand to benefit as they expand production capacities and plan new facilities in markets like the US to access affluent consumers. This transition supports manufacturers, battery producers, and renewable energy firms involved in Vietnam's energy transformation.

However, the absence of national standards for EV infrastructure may hinder progress, dissuading potential buyers, posing grid challenges, and increasing safety risks. Despite plans to install 300 charging stations by 2023, VinFast faces legal and technical hurdles that could postpone these developments, underscoring the necessity for clear regulatory frameworks to bolster Vietnam's ambitious environmental goals.

Objectives: The overall objective of developing national standards for key EV charging infrastructure aims to establish a legal and technical framework ensuring the safety and quality of EV charging infrastructure. This framework supports the local supply chain development, regulates the quality of both local and imported products, and fosters a fair

market environment for EV producers and charging infrastructure manufacturers. This objective will be pursued through our three Specific Objectives (SO) outlined below:

+ **Specific objective 1**: Review international standards, customize and create new national standards, or adopt the standards to the Vietnam context based on government procedures.

+ **Specific objective 2**: Communicate the national standards to the vehicle manufacturers (local and international), provide training, and disseminate the standards and standard quality control processes to the policy executors.

+ **Specific objective 3**: Support the relevant government agencies of Vietnam (customs, market management inspectors, quality control authorities) to manage the industry and the sector based on the established national standards and provide the BLT. Cert and SMEDEC 2's services (verification, training, consulting, testing, technology transfer, trade promotion) to potential clients relevant to e-vehicle and charging stations production and operation.

Expected Results:

Result 1: Approval and publication of 08 national standards for charging stations (TCVN):

- National standards for charging stations will be drafted and reviewed by relevant authorities.
- After the review and discussion process, the standards will be officially approved and published for implementation.

Result 2: Dissemination of national standards to the industry and stakeholders:

- The national standards will be widely disseminated to manufacturers, importers, relevant ministries, and other stakeholders through workshops, training sessions, and official information channels.
- Facilitate the application of these standards in practice.

Result 3: The issuance of standards for charging stations contributes to the standardization and unification of the construction and operation of electric vehicle charging stations. At the same time, it increases the reliability and safety of the operation of charging

infrastructure, contributing to the strong development of the local electric vehicle industry and supporting infrastructure.

Result 4: The issuance of these standards will facilitate the transition from fossil fuel vehicles to electric vehicles, thereby contributing to the reduction of environmental pollution.

2. Project Implementation

Over the past eight months, from October 2023 to May 2024, BLT. Cert has been engaged in a project to draft and set national standards for electric vehicle (EV) charging station infrastructure across Vietnam. The team has worked to establish a framework that aligns with both local and international regulatory requirements, aiming to promote sustainable and efficient EV adoption nationwide.

Achievements

2.1. Drafting National Standards and Technical Specifications

Since October 2023, the BLT.Cert team, comprising professionals from automotive engineering, electrical standards, and sustainable transportation sectors, has made significant progress in drafting eight national standards for electric vehicle (EV) charging stations in Vietnam. This initiative aims to enhance the safety, efficiency, and interoperability of EV infrastructure, crucial for the adoption and success of electric vehicles in the region.

The drafting process involved a comprehensive analysis of existing international standards and adaptations to fit the local technological landscape and regulatory requirements. These standards cover various critical aspects of EV charging systems, including electrical safety measures, connector types, communication protocols between charging stations and vehicles, and the overall reliability of charging equipment. This ensures that all components of the EV charging infrastructure are compatible not only within Vietnam but also with global systems, facilitating international manufacturers' entry into the local market.

Additionally, the standards address environmental considerations, promoting the sustainability of electric vehicles. This includes guidelines on minimizing electromagnetic emissions and efficiently using energy, essential for reducing the environmental impact of these systems. The technical specifications also outline robust testing and maintenance procedures to ensure the long-term reliability and safety of the charging stations.

The BLT.Cert team has worked diligently to ensure that these standards are comprehensive, scientifically sound, and practical for implementation by businesses and regulatory bodies. The drafting process involved multiple rounds of consultations with industry stakeholders to gather input and ensure that the standards meet the practical needs of manufacturers, service providers, and end-users. By establishing a clear and effective framework for EV charging infrastructure, this project aims to facilitate a smooth transition for Vietnam towards a more sustainable transportation ecosystem, aligning with global technological advancements and environmental goals.

The list of standards includes:

+ (1) ISO 15118-1:2019 Road vehicles - Vehicle to grid communication interface - Part 1: General information and use-case definition;
+ (2) ISO 15118-2:2014 Road vehicles — Vehicle-to-Grid Communication Interface - Part 2: Network and application protocol requirements;
+ (3) ISO 15118-3:2015 Road vehicles - Vehicle to grid communication interface - Part 3: Physical and data link layer requirements;
+ (4) ISO 15118-4:2018 Road vehicles - Vehicle to grid communication interface - Part 4: Network and application protocol conformance test;
+ (5) ISO 15118-5:2018 Road vehicles - Vehicle to grid communication interface - Part 5: Physical layer and data link layer conformance test;
+ (6) ISO 15118-8:2020 Road vehicles - Vehicle to grid communication interface - Part 8: Physical layer and data link layer requirements for wireless communication;
+ (7) ISO 15118-9:2020 Road vehicles - Vehicle to grid communication interface - Part 9: Physical and data link layer conformance test for wireless communication;

+ (8) ISO 15118-20:2022 Road vehicles — Vehicle to grid communication interface — Part 20: 2nd generation network layer and application layer requirements.

2.2. Testing Prototypes and/or Products

In an effort to advance national standards for electric vehicle (EV) charging infrastructure, BLT. Cert invited representatives from STAMEQ's key technical units—Metrology Department, Vietnam Metrology Institute (VMI), and Quality Assurance and Testing Center 1 (Quatest 1)—to consult on the prototype testing plan. Concurrently, BLT. Cert collaborated closely with VinFast LLC to conduct comprehensive prototype testing at their facilities. This critical phase of the project focused on testing, measuring, and calibrating the EV charging stations to ensure they meet the rigorous demands of the draft standards under development.

Two meetings were organized before and after the on-site survey at the VinFast LLC factory in Hai Phong to establish objectives, review progress, and evaluate the inspection, calibration, and testing of the prototype charging stations. The meetings and on-site survey took place in April and May 2024, involving experts from the Metrology Department, Vietnam Metrology Institute, and Quality Assurance and Testing Center 1 (Quatest 1).

To achieve these objectives, the proposed standards must address the identified gaps and issues outlined in the following table:

No	Identified gaps	Addressed issue
1	Specifications and testing methods	1. Vocabulary 2. Unit parameters 3. Test and testing methods
2	Planning and Performance assessments	1. System environment 2. System sizing and selection 3. Functional system performance 4. Performance assessments 5. Design, Operation, and Maintenance
3	Environmental issues	1. Guidance on environmental issues

		2. Standard on environmental issues 3. Greenhouse gas (GHG) emissions assessment
4	Safety considerations	1. Safety considerations 2. Safety requirements 4. Safety test methods and procedures 5. Fire protection

The selection of reference standards for research and comparison follows this priority hierarchy:

- **IEC (International Electrotechnical Commission):** This is the highest priority, ensuring conformity with existing Vietnamese standards related to EV charging stations.
- **International Standards (e.g., ISO):** Adopted following the precedence of adapting ISO standards within Vietnam.
- **IEEE (Institute of Electrical and Electronics Engineers) Standards:** Adopted following the precedence of adapting IEEE standards within Vietnam.
- **International Regional Standards (e.g., Eurocode):** Considered following IEC, ISO, and IEEE standards.
- **National Standards (e.g., from the UK, Germany, China, and Australia):** Used when regional or international standards do not suffice.
- **Internationally Recognized Institutional or Association Standard Systems (e.g., NFPA):** Considered when higher-priority frameworks are not applicable.

Based on research objectives and principles, the implementation steps are as follows:

- **Testing Phase:** Designed to assess the functional performance of charging stations through controlled experiments evaluating electrical safety, connectivity, user interface, and operational efficiency. Real-world simulations allowed observation of prototypes under various conditions, ensuring efficiency and robustness.

- **Measurement:** Focused on precise quantifications, such as voltage, current, and power output, using advanced instruments to ensure compliance with draft standards. These measurements provided a quantitative basis for evaluating the stations' compliance and highlighted areas for improvement.
- **Calibration:** Ensured the accuracy of testing equipment to guarantee reliable and replicable data. Regular calibration checks maintained measurement precision, critical for establishing standard compliance.

Discussions with VinFast representatives were crucial, providing insights into practical aspects of charging station design and operation. These interactions helped tailor testing protocols to align with both draft standards and practical realities, ensuring standards were theoretically sound and practically viable.

The collaborative efforts in testing, measuring, and calibrating prototypes at VinFast's facilities validated the functionality and reliability of the EV charging stations. This phase provided the necessary empirical data to refine the draft standards, ensuring they meet technical specifications and user requirements. By adhering to meticulously developed protocols, this project is paving the way for a standardized, efficient, and reliable EV charging infrastructure in Vietnam.

2.3. Site Surveys: BLT. Cert conducted multiple site surveys at a local factory in Hai Phong as part of the project to develop national standards for EV charging stations. These surveys provided firsthand insights into the practical implementation of proposed standards in real-world settings. By visiting production facilities, the team could observe and assess existing infrastructures, workflows, and the integration capabilities of new charging technologies.

The surveys identified potential challenges in localizing production processes to meet new standards, such as spatial configurations, electrical supply logistics, and compatibility with current manufacturing technologies. They also uncovered opportunities for optimizing production processes and enhancing efficiency through standardized procedures. These findings are instrumental in shaping the final standards, ensuring they are technically sound and pragmatically applicable.

2.4. Organizing Workshops: In May 2024, BLT. Cert organized a workshop titled "Technical Support for the Development of 08 National Standards for Electric Vehicle Charging Station Infrastructure in Vietnam." This workshop served as a platform for discussion and feedback on the ongoing development of these standards. Held in a hybrid format, it brought together around 50 participants, including government officials, industry experts, and academic scholars.

The workshop's objectives were to provide an update on the standards' progress, introduce the technical specifics, and solicit feedback to ensure the standards meet practical, regulatory, and technical requirements. The interaction facilitated a deeper understanding of the challenges and opportunities within the EV charging infrastructure sector, fostering a collaborative approach to resolving issues. The workshop advanced the project's goals and strengthened collaboration among stakeholders, ensuring the final standards will be robust and applicable across various contexts in Vietnam's burgeoning EV market. This event underscored the importance of collective effort and expert engagement in setting the foundation for Vietnam's sustainable transportation future.

The summary table below will present in more detail the results and activities achieved by the project during this reporting period.

ACTIVITY	SPECIFIC ACTIVITY	DELIVERABLE	DUE DATE	IMPLEMENTING BODY
Result 1: 09 key standards for e-vehicle charging infrastructure (out of 63 standards) are in place.	3.2. Drafting the national standards and technical specification	1 draft report on charging station standards	September 2023 to December 2023	BLT.Cert
	3.3. Site surveys to local factories or countries where the products are produced	1 survey report	January 2024	BLT.Cert
	3.4. Testing prototypes and/ or products available in the market if necessary	1 Test report	April 2024 to May 2024	BLT.Cert
	3.5. Internal technical consultations and finalization of the draft	1 draft report on charging station standards	January 2024 to May 2024	BLT.Cert
	4. Consultation workshops with experts, manufacturers, and relevant stakeholders, finalization of the draft standards	1 report on 1 workshop and comments on the draft report from relevant stakeholders.	May 2024	BLT.Cert
	5. Appraisal: The draft standards shall be appraised by the National Appraisal Committee.	N/a	N/a	N/a
	- Publication of the standards with technical guidelines	N/a	N/a	N/a

Result 2: Dissemination of the standards to the industry (manufacturers, importers, ministries)	- Conduct 3 workshops with around 150 participants.	N/a	N/a	N/a
	- Provide training sections and contact information for further questions on the new 8 standards..	N/a	N/a	N/a
Result 3: Safety and quality of charging infrastructure are ensured through regular inspection of relevant authorities.	- Daily exchange of information with the relevant authorities in issues related to e-vehicle charging infrastructure.	N/a	N/a	N/a
	- Providing BLT. Cert and SMEDEC 2's services, including verification, training, consulting, testing, technology transfer, and trade promotion, to potential clients (both public and private).	N/a	N/a	N/a

3. Challenges and Solutions

Confidentiality and Publication of Test Results

Following our initial report on standard testing for the 08 charging station standards, we engaged in discussions with representatives from VinFast LLC to test the stations based on certain parameters outlined in the draft of the 08 standards. After over a month of implementation (April - May 2024), we completed tests on several parameters. VinFast's agreement and cooperation were crucial for evaluating the feasibility of these standards in practice. However, due to VinFast's regulations and confidentiality principles, the test results cannot be published outside their scope. We respect and adhere to VinFast's regulations and appreciate their support. We have completed a comprehensive report detailing the requirements, regulations, and procedures for verifying charging stations based on our collaborative research with VinFast.

According to the assessment by project experts and VinFast staff, the standards and test criteria represent new technologies globally and specifically in Vietnam. The newly developed standards for charging stations contribute to the global and national development of electric vehicles and charging systems. In Vietnam, this development aligns with the government's commitment to achieving net-zero emissions by 2050, supporting sustainable development.

Based on the research results and practical testing capabilities of the draft standards, we recommend that the General Department of Standards, Metrology and Quality (STAMEQ), Ministry of Science and Technology (MOST), adopt the international ISO standards as national standards. Consequently, the testing criteria should be approved and fully tested at international laboratories. This recommendation aligns with international practices in various countries, particularly within the ASEAN region, where standardization activities are well-developed. Countries like Indonesia, Malaysia, Thailand, Vietnam, the Philippines, and Singapore are active members of leading international standardization organizations and have high acceptance rates of international standards as national standards, facilitating trade and overcoming technical barriers.

Adjustment of Standards

During our project review in April 2024, we encountered a challenge in developing national standards for electric vehicle charging stations in Vietnam. One of the planned standards, ISO/DIS 15118-21:2024, was still in the inquiry phase among ISO members. According to the ISO-IEC Directive part 1-1, this inquiry draft requires a 12-week voting period by National Bodies and must receive a two-thirds majority of positive votes with no more than one-quarter negative votes for approval. Given this stringent process, there is a substantial risk that the standard may undergo significant modifications before finalization.

Developing the corresponding TCVN (Vietnamese National Standard) based on this ISO draft poses several risks. The potential evolution of the international standard could render any concurrently developed national standards outdated or irrelevant upon completion. This misalignment could lead to technically inadequate standards that fail to meet the practical needs of charging infrastructure, becoming obsolete when the updated ISO standard is published.

To mitigate these risks, a strategic decision was made in consultation with the Directorate for Standards, Metrology, and Quality. It was unanimously agreed to remove ISO/DIS 15118-21:2024 from our project scope, ensuring we avoid aligning our national standards with an international reference still subject to change. Deferring the development of this standard until its official publication safeguards the relevance and applicability of our national standards. This decision reflects our commitment to quality and strategic foresight in national standards development, contributing positively to the sustainable advancement of Vietnam’s transportation sector.

4. Gender Equality

In developing eight essential national standards for electric vehicle charging infrastructure in Vietnam, BLT.Cert has demonstrated a strong commitment to gender equality, a cornerstone of its organizational values. The project team comprises 40 professionals, including 12 women, reflecting BLT.Cert's dedication to fostering a diverse and inclusive work environment. Despite challenges in finding experienced female

professionals in this technical field, BLT.Cert has persisted in its efforts to advance gender diversity.

From the onset of this project, BLT.Cert has actively sought to recruit qualified female experts, recognizing that diverse teams bring valuable perspectives crucial for innovative and effective solutions. This proactive approach to gender inclusion ensures that the standards development process benefits from a broader range of insights, leading to more comprehensive and adaptable infrastructure solutions. BLT.Cert's commitment to gender parity extends beyond mere numbers; it integrates diverse perspectives into the project, enhancing decision-making and enriching outcomes.

By prioritizing gender equality, BLT.Cert not only improves the project but also contributes to building a more equitable society. This commitment sets a notable precedent in the electric vehicle industry, demonstrating to other organizations the value of embracing diversity. BLT.Cert's efforts to promote gender diversity are about creating an environment where all employees, regardless of gender, have equal opportunities to contribute and excel. Through this dedication to gender diversity and equality, the project and BLT.Cert aim to inspire systemic changes within the industry, fostering an inclusive culture that supports and celebrates the contributions of women in technology and innovation.

5. Lesson learned

Based on the activities during the period from October 2023 to May 2024, the BLT Cert. team has gained valuable insights from the ongoing execution of this project. These insights or "lessons learned" are crucial as they not only shape current strategies but also guide future projects in similar domains. This reflection covers four key areas: Effective Partnership Development, Flexibility in Project Implementation, Establishment of a Media Network, and the realities of EV infrastructure development in Vietnam.

Effective Partnership Development: One of the first lessons learned is the importance of cultivating strong partnerships. For this project, collaborating closely with local entities like VinFast has been pivotal. Such partnerships are beneficial for gaining in-depth knowledge and insights into local market needs and technical standards, which

are essential when developing national standards. Building a robust network of supportive partners ensures a stream of shared expertise and resources, facilitating smoother project execution and adaptation to local contexts.

Flexibility in Project Implementation: The project has underscored the need for flexibility in handling complex standard development processes. Initially, BLT Cert. planned to establish a comprehensive set of standards aligned with international benchmarks. However, the dynamic nature of technology and regulations, especially in an emerging market like Vietnam, taught the team to adapt swiftly to changing circumstances. For example, when confronted with delays in the formal issuance of international standards BLT Cert. depends on, such as ISO/DIS 15118-21:2024, the team learned to modify its approach and timeline accordingly. This adaptability ensures that the project remains on track and relevant despite external fluctuations.

Challenges of EV Infrastructure Development in Vietnam: A major challenge has been the nascent stage of EV infrastructure in Vietnam. The lack of established large manufacturers and comprehensive testing facilities for EV charging stations has posed significant hurdles. There is a dire need for enhanced infrastructure capable of testing, verifying, and calibrating as per the developed standards. BLT Cert.'s project has had to navigate these gaps by leveraging international collaborations and advocating for infrastructural development within the country.

From these lessons, it is evident that developing standards for EV charging stations in a market like Vietnam requires a well-rounded approach that involves robust partnership networks, adaptability in project management, effective communication strategies, and proactive infrastructural advocacy. Each of these elements plays a critical role in not only advancing the project but also in paving the way for a more sustainable automotive future in Vietnam. These experiences provide a blueprint for handling similar projects in emerging markets, emphasizing that while challenges are inevitable, they also offer opportunities for innovation and strategic problem-solving.

II. Progress against Result Based Management Framework

Impact Level:

- The development of 8 standards for communication between the charging stations and the electricity grid will allow the charging station to be installed and the station owners can get licenses from the government authorities to install their charging stations.
- Directly impact the green transport development in Vietnam and indirectly contribute to the reduction of 52.4 million tons and 106.2 million tons of greenhouse gas in 2030 and 2050 respectively.

Long-Term Outcome:

- The national standards for e-vehicle charging stations establish the foundation for the long-term development of the green transport sector, reduce emissions, and accelerate energy transition.

Intermediate Strategic Outcomes	**Project Indicator**	**Baseline**	**Target**	**Actual/ Accomplishment**	**Data Source and Means of Verification**
Strategic Outcome 1. Strengthened Enabling Policy Environment					
Select Outcomes applicable to your project and indicate your project-specific output.	Indicate the project-specific indicator for the selected outcome	Indicate the baseline for your specific output	Set target (quantitative preferably)	Provide the actual as part of the progress report	Specify means to verify the target
Short-Term Outcome 1.1 Standards for e-vehicle charging infrastructure are developed.	Standards for e-vehicle charging infrastructure are in place	There are no national standards for creating, manufacturing, or installing e-	8 key national standards for communication and connection		Adoption and publication of the national standards by the Ministry of Science and Technology

		vehicle charging infrastructure.	between the charging stations and electricity network are developed out of the 63 standards.		
Short-Term Outcome 1.2 National standards of e-vehicle charging infrastructure are disseminated to the industry (manufacturers, importers, ministries) and relevant stakeholders.	The number of people that attended the workshop on applying the standards.	Standards for e-vehicle charging infrastructure have not been established and disseminated in Vietnam.	50 participants in the workshop in person.		Reports on a post-workshop (Documentary Review)
Short-Term Outcome 1.3 Safety and quality of charging infrastructure are ensured	The number of certified and verified charging stations	Safety and quality of charging infrastructure have not been	100 charging stations will be set up in Vietnam by		-Annual sector reports; - Publications of manufacturers and automobile associations

		established and assured.	the end of 2024.		(Documentary review).

III. Plan for the next reporting period

ACTIVITY	SPECIFIC ACTIVITY	DURATION OF ACTIVITIES																
		01-06-23	01-07-23	01-08-23	01-09-23	01-10-23	01-11-23	01-12-23	01-01-24	01-02-24	01-03-24	01-04-24	01-05-24	01-06-24	01-07-24	01-08-24	01-09-24
Result 1: 09 key standards for e-vehicle charging infrastructure (out of 63 standards) are in place	1.Submission of proposal for the development of the national standards																
	2. Approval of the standard development project and its development schedule																
	3. Technical development of the draft standards																
	3.1. Data collection and analysis																
	3.2. Drafting the national standards and technical specification																
	3.3. Testing prototypes and/ or products available in the market if necessary																
	3.4. Site surveys to local factories or countries where the products are produced																
	3.5. Internal technical consultations and finalization of the draft																
	4. Consultation workshops with experts, manufacturers, and relevant stakeholders, finalization of the draft standards																
	5. Appraisal: The draft standards shall be appraised by the National Appraisal Committee.																
Result 2: Dissemination of the standards to the industry (manufacturers, importers, ministries)	- Publication of the standards with technical guidelines																
	- Conduct 3 workshops with around 150 participants.																
	- Provide training sections and contact information for further questions on the new 8 standards..																
Result 3: Safety and quality of charging infrastructure are ensured through regular inspection of relevant authorities.	- Daily exchange of information with the relevant authorities in issues related to e-vehicle charging infrastructure.																
	- Providing BLT. Cert and SMEDEC 2's services, including verification, training, consulting, testing, technology transfer, and trade promotion, to potential clients (both public and private).																

: Completed activities : N/a

Annex 1: In-depth Report

1. Background

Electric vehicle charging stations are an essential component of the infrastructure supporting electric vehicles (EVs). Ensuring that these charging stations operate efficiently and safely is a crucial factor in promoting the use of electric vehicles. This report will analyze the process of certifying charging stations according to legal regulations in Vietnam, including aspects of testing, measurement, and calibration.

1.1. The development of electric vehicles in Vietnam

VinFast is currently the only electric car manufacturer in Vietnam. In addition to producing electric cars, VinFast has also launched electric motorcycles and electric bicycles to the market. With these new products, VinFast has become one of the first companies in the world to have a "green" ecosystem that includes electric cars, electric motorcycles, electric buses, and electric bicycles, contributing to the promotion of a sustainable and environmentally friendly living environment.

According to VinFast's report, alongside vehicle development, VinFast has planned 2,121 charging station locations across all 63 provinces, with more than 2,000 stations and nearly 40,000 charging ports that comply with international and European standards.

The charging stations vary, including standard 11 kW AC car chargers, 30 kW and 60 kW DC fast chargers, 250 kW DC super fast car chargers, and 1.2 kW AC motorcycle chargers.

VinFast charging stations are located in apartments, gas stations, rest stops, parking lots, schools, etc.

VinFast has also collaborated with other parties to install and operate electric vehicle charging stations, such as partnering with Petrolimex. It is expected that in the years 2022-2023, more than 500 VinFast electric vehicle charging stations will be installed and serve customers at Petrolimex fuel stations nationwide.

As of October 14, 2022, VinFast has completed the installation of a total number of charging stations (charging stations for electric cars, electric motorcycles, and electric bicycles) as follows:

- In the North: 493 charging stations across 26 provinces.
- In the Central region: 318 charging stations across 19 provinces.
- In the South: 256 charging stations across 20 provinces.

Currently, VinFast Trading and Service Co., Ltd. has a policy that customers must pay for the electric charging service based on the amount of electricity consumed by the electric meter installed at public locations such as parking lots (Source: https://VinFastauto.com/vn_vi/he-thong-tram-sac-va -thiet-bi-sac).

In addition to Vinfast, the Central Vietnam Electricity Corporation has also tested and operated electric vehicle charging stations at several locations including the headquarters of the Central Vietnam Electricity Corporation, and PVOIL gas stations in the city of Da Nang… **The product was developed by the Central Power Electronics Manufacturing Center (under EVN)**. The center has completed and delivered 6 charging stations to customers, expected to be installed in Hanoi. According to research, this is the first fast charging station for electric vehicles in the market branded by a Vietnamese manufacturer that does not make cars. The charging station can charge up to 80% battery within 30 - 40 minutes depending on the battery capacity of the vehicle.

The station has the capability to stop charging upon request from the vehicle or via an operation on the screen. It meets the regulations for DC charging stations for electric vehicles according to Asian and European standards such as IEC 61851-23/24, IEEE 2030.1.1, etc.

The EVN-produced station is compatible with the electrical payment system in Vietnam and can be expanded to integrate many standards for the same charging station (CCS, Tesla, GB/T) (optional). At the same time, the power can be upgraded to 120 kW.

According to the introduction, the 6 EVN charging stations delivered to customers this time have an output of 60 kW per station, DC fast charging type, equipped with two charging ports, CHAdeMO charging standard, with normal charging modes, full battery charging, and time-based charging depending on the customer's choice. The user interface

is equipped with a 17.78 cm (7 inches) display screen, color, and touchscreen, supporting Vietnamese and English.

With this strategy, other electric car companies wanting to expand their market in Vietnam must consider building a charging station system like VinFast. And EVN - an independent company that does not produce electric vehicles, investing in developing a charging station system will also be a solution for car companies wanting to sell electric vehicles in Vietnam.

Some brands such as Porsche, Audi, and Mercedes-Benz have also established charging station systems for customers, however, the number is still limited, mostly only installed at showrooms or factories of the brands. Brands like Audi and Mercedes-Benz both have plans to expand the charging station system, especially in large cities. A representative of Audi Vietnam mentioned that it is expected to expand about 15 more charging points in Ho Chi Minh City.

In addition, several world-leading enterprises in the field of electric vehicle charging station systems have also expanded their business market of electric vehicle charging stations in Vietnam such as Siemens, Charge+, and ABB.

1.2. Global Development of Electric Vehicles

Currently, there are about 16.5 million electric vehicles worldwide, with an increase of 6.6 million in 2021 alone, and approximately 2 million sold in just March 2022. Nearly 10% of global vehicle sales are electric vehicles. In 2021, there were about 1.8 million public charging points worldwide, a third of which were fast chargers. In 2021 alone, 500,000 charging units were installed. It is estimated that by 2040, 290 million charging points will be needed to transition to electric vehicles according to commitments. (Source: International Energy Agency - IEA).

- Europe: In 2021, there were about 290,000 charging points, to reach 1 million by 2025 and 3 million by 2030.

- China: In 2021, there were about 1.1 million charging points. The electrification goal for 2022 includes enough charging stations for 20 million EVs, evenly distributed in both rural areas and transport corridors (currently 70% are concentrated in Guangdong and Shanghai), and 60-80% of service points on highways have fast chargers... Plans to build 1000 battery swap stations and produce 100,000 battery-swappable vehicles. Many policies promote incentives for charging station development at both national and local levels.

- Japan: Aims to have 150,000 charging points by 2030, requiring an infrastructure investment of $342 million, of which $114 million is for new charging and hydrogen refueling stations.

- South Korea: Targets to increase from 8,000 to 30,000 charging points by 2022 with an investment of $21 million increased to $65 million for slow charging stations and from $3.9 million to $32 million for fast charging.

- Thailand: Currently has 1,500 public charging stations. Aims for 12,000 fast charging stations and 1,450 battery swap stations for electric motorcycles by 2030.

- USA: Currently has 100,000 public charging stations. Aims to have 500,000 fast-charging stations by 2030 with a $5 billion investment for this goal. The U.S. government has drafted proposals to standardize the electric vehicle charging station system supported by government financing, to synchronize public charging technology nationwide. Charging stations are to be placed no more than 50 miles apart and next to a traditional gas station. Each "standard" charging station should also have at least 4 regular charging ports allowing four vehicles to charge simultaneously and 4 fast charging ports. Moving towards using a unified application for all types of charging stations.

1.3. Legal Regulations Related to Charging Station Inspection in Vietnam

Inspection is a legal requirement for measuring devices that are mandated to undergo inspection before operation and periodically during their operational life, as specified in Circular 23:2013/TT-BKHCN.

The inspection process involves using certified reference materials/standards linked to the measuring equipment, which are re-measured within the equipment's measuring range. The remeasurement results must fall within the permissible error margin. If so, the equipment is sealed and certified. If the remeasurement does not meet requirements, the inspecting organization advises the user to repair/calibrate the equipment for reinspection. Inspection organizations are evaluated and authorized by the Directorate for Standards, Metrology, and Quality.

Relevant laws and legal documents:

+ The Law on Standards and Technical Regulations (2006): Governs the issuance and application of standards and technical regulations.
+ The Law on Measurement (2011): Regulates measurement, including the inspection of measuring devices.
+ Circular No. 07/2021/TT-BKHCN: Guidelines for inspection, calibration, and testing of measuring devices.
+ Technical standards:
+ QCVN 11:2020/BKHCN: National technical regulation on electric vehicle charging stations.

+ TCVN 12345:2020: Vietnamese standard for technical requirements for fast charging stations.

Currently, many electric power measurement devices (including those for electric cars, motorcycles, and bicycles) have dedicated functions to supply power (from the seller) to electric vehicles (the buyer) and measure the amount of power consumed for charging. However, these devices are not yet regulated.

Charging (also known as power supply) for electric vehicles is conducted via Electric Vehicle Energy Metering Equipment, which are devices or assemblies that provide dedicated functions for power supply and accurately determine the amount of power charged to the vehicle.

Electric power measurement devices include display screens, charging plugs, charging cables, and stands. These are components of a station providing power to electric vehicles, and each station can offer multiple components with varying power capacities and charging capabilities.

Globally, Electric Vehicle Energy Metering Equipment comes in capacities of 11 kW, 30 kW, 60 kW, and 250 kW, and includes both Direct Current (DC) and Alternating Current (AC) types.

AC Electric Vehicle Energy Metering Equipment for electric vehicle charging typically has a charging power of 11 kW, with an energy measurement error of 0.5% and 1%.

DC Electric Vehicle Energy Metering Equipment for electric vehicle charging provides fast charging with power capacities of 30 kW or 60 kW, with an energy measurement error of 0.5% and 1%; The type with up to 250 kW is ultra-fast charging, also with an energy measurement error of 0.5% and 1%.

Thus, Electric Vehicle Energy Metering Equipment is a measuring device used to provide services in the sale and payment of electricity consumed during vehicle charging. According to international practices, Electric Vehicle Supply Equipment must be controlled for measurement. Therefore, the International Organization of Legal Metrology (OIML) has issued OIML G22, providing technical measurement requirements and guidelines for the control of these measuring devices. In Vietnam, these devices have been implemented to provide services for the payment of electricity consumed, requiring management to ensure fairness between the buyer and seller.

With the technical details described, Electric Vehicle Energy Metering Equipment meets the requirements stipulated in Section 2, Article 16 of the Law on Measurement. Hence, this device is categorized as a group 2 measuring device, requiring state management of measurement. Therefore, charging stations need to undergo initial inspection before use, periodic inspection during use, and inspection after repairs.

Corresponding to these regulations, there are technical standards and related standards to provide bases for comparison when applying measurement and calibration methods. The 08 charging station standards currently being developed are reference standards for conducting testing, measurement, and inspection activities before use, during use, and after repairs.

1.4. Inspection Process for Charging Stations

- Testing: Testing a charging station involves checking basic functionalities such as voltage, current, and safety features. These tests ensure that the charging station meets the technical and safety requirements before it is put into operation.
- Measurement: The measurement process involves using specialized measuring devices to verify the technical parameters of the charging station, such as voltage, current, and power. These measuring devices must be calibrated and periodically inspected to ensure accuracy.
- Calibration: Calibration is the process of adjusting and rechecking measuring devices to ensure their accurate operation. The devices used in the inspection process of charging stations need to be regularly calibrated according to national and international standards.

1.5. Management Policies for Charging Station Inspections

1.5.1 Some management policies for Electric Vehicle Energy Metering Equipment globally

In October 2022, at the 57th Meeting of the International Committee of Legal Metrology (CIML) – International Organization of Legal Metrology (OIML), a new guideline was announced, OIML G 22 "Technical requirements for measurement, testing procedures, and measurement control for Electric Vehicle Supply Equipment (EVSE)," and it was recommended that member countries, including Vietnam, develop technical measurement documents in line with OIML G 22 to control measurement for this type of equipment when needed.

In August 2021, the National Measurement Institute (NMI) of Australia also published a policy document/consultation paper on measurement policies for Electric Vehicle Charging Stations. NMI is currently reassessing the entire Australian measurement regulatory framework to include measurement control regulations for Electric Vehicle Supply Equipment, including requirements for model approval and inspection of these measuring instruments. (Source: Australian Government's official website, https://consult.industry.gov.au/trade-measurement-policy-for-electric-vehicle).

Given the rapid development of electric vehicles, regions worldwide are currently reviewing and developing management documents and technical requirements for Electric Vehicle Supply Equipment.

1.5.2. For Vietnam

Article 16, Clause 2 of the Measurement Law specifies that measuring devices used for quantifying goods and services in transactions and payments that fall under the Category 2 measuring devices list must be controlled as per the technical measurement requirements set by the competent state management agencies.

According to point b, Clause 1, Article 55 of the Measurement Law, the responsibilities of the ministry, and ministerial-level agencies include "Proposing the types of Category 2 measuring devices, pre-packaged goods in Category 2, and the technical measurement requirements for Category 2 measurements for the issuance by the Ministry of Science and Technology."

On December 26, 2022, the Ministry of Industry and Trade issued Official Document No. 8353/BCTKHCN proposing the addition of Electric Vehicle Energy Metering Equipment to the Category 2 measuring devices list.

❖ **Inspection Agencies:**

- The Directorate for Standards, Metrology, and Quality is the government body responsible for standards, metrology, and product quality in Vietnam. This agency issues norms and guidelines related to the inspection of charging stations.
- Licensed inspection centers by the Directorate for Standards, Metrology, and Quality conduct testing, measurement, and calibration of charging stations. These centers must meet stringent technical and management requirements.

1.6. Methods and Equipment Used in Inspections

❖ **Measurement Equipment:**

The measurement equipment used in the inspection of charging stations includes devices to measure voltage, current, power, and electrical safety testing devices. These devices need to be calibrated and periodically tested.

❖ **Testing Technology:**

Testing technology includes systems that simulate the real operational conditions of charging stations to test their functionality and safety. These systems help ensure that the charging stations operate efficiently and safely under all circumstances.

1.7. Current Challenges and Solutions for Vietnam

- **Challenges in Inspection:**

  Infrastructure Shortcomings: The infrastructure for testing and calibration in Vietnam is still limited.

  Lack of Specialized Personnel: There is a need for more specialized training programs for charging station inspectors.

- **Proposed Solutions**

  Infrastructure Investment: Build more inspection centers and equip them with modern devices.

  Personnel Training: Enhance training programs and improve the professional level of inspectors.

2. Implementation Progress

From February to April 2024, the collaborative efforts of BLT. Cert and the SMEDEC 2 project team commenced as they engaged in discussions with several charging station providers to assess the current state of the market's charging stations. In April and May 2024, field visits to the charging stations and manufacturing facilities of Vinfast Corporation in Hai Phong were conducted to initiate a cooperative process and receive support from Vinfast in the feasibility study for the inspection processes related to the draft of the project's 8 standards **(The inspection process of charging stations in Vietnam includes three main activities: testing, measurement, and calibration).** The focus of this phase's report is on evaluating the results of the inspections and assessing the compatibility and feasibility of the standards.

Notably, this phase witnessed the execution of several test criteria at the VinFast Manufacturing and Trading (VinFast LLC) facility in Hai Phong. Detailed information about our work is provided below:

Previously, to execute tests on the drafted standards, BLT. Cert and SMEDEC 2 have collaborated with experts in relevant fields to establish requirements and identify necessary criteria for effective testing. The contents encompass:

- **Standard number 1: ISO 11518-1:2019 standard "Road vehicles - Vehicle to grid communication interface - Part 1: General information and use-case definition"**

  This standard provides a common framework and guidance on requirements and regulations for the electronic interface between electric vehicles and charging systems. Moreover, it also explains the concepts, terminology, and basic definitions used in the standard and the electric vehicle industry.

  As reported in part 1 of the testing phase, testing this standard is unnecessary.

- **Standard number 2: ISO 15118-2:2014 standard "Road vehicles — Vehicle to grid communication interface - Part 2: Network and application protocol requirements"**

  The testing will be carried out based on 5 criteria, including:

  - Testing network and application protocol compatibility:

+ Identify and test the compatibility of network and application protocols according to ISO 15118-2:2014 standard.

+ Ensure that network and application protocols operate efficiently and are compatible with each other in different usage scenarios.

- Testing safety and security:

+ Perform tests to ensure that the electronic interface between electric vehicles and charging stations meets safety and security requirements according to ISO 15118-2:2014 standard.

+ Ensure that security measures such as encryption and authentication are implemented correctly and operate effectively.

- Testing reliability and performance:

+ Conduct tests to evaluate the reliability and performance of the electronic interface under various conditions, including data transmission speed, latency, and stability.

+ Ensure that the interface operates stably and reliably in all situations.

- Testing compatibility and connectivity:

+ Verify the correctness of the connection and communication process between different devices, including electric vehicles and charging stations.

+ Ensure that the interface can connect and interact with various devices and systems flexibly.

- Testing physical and data link layer compatibility:

+ Identify and test the compatibility of the physical and data link layers according to ISO 15118-2:2014 standard.

+ Ensure that the physical and data link layers meet the requirements for transmission and communication between electric vehicles and charging stations.

❖ **Standard number 3: ISO 15118-3:2015 standard "Road vehicles - Vehicle to grid communication interface - Part 3: Physical and data link layer requirements"**

The testing will be carried out based on 4 criteria, including:

- Physical Layer Compatibility Testing:

+ Identify and test the compatibility of the physical layer with specific transmission media used in the electronic interface between electric vehicles and charging stations.

+ Test signal transmission capability and adjust transmission power to ensure stable and reliable connections.

- Data Link Layer Compatibility Testing:

+ Identify and test the compatibility of the data link layer protocol with different devices and systems.

+ Ensure synchronization and reliability of data transmission to ensure continuous and stable communication.

- Performance Testing of Physical and Data Link Layers:

+ Conduct tests to evaluate the performance of the physical and data link layers under various conditions, including data transmission speed, latency, and stability.

+ Ensure that the interface operates stably and reliably in all situations.

- Compatibility and Connectivity Testing:

+ Verify the correctness of the connection and communication process between different devices, including electric vehicles and charging stations.

+ Ensure that the interface can connect and interact with various devices and systems flexibly.

❖ **Standard number 4: ISO 15118-4:2018 standard "Road vehicles - Vehicle to grid communication interface - Part 4: Network and application protocol conformance test"**

The testing will be carried out based on 4 criteria, including:

- Testing Communication Protocol:

+ Verify compatibility between electric vehicles and charging stations through the communication protocol defined in the standard.

+ Ensure that communication signals are transmitted and received correctly according to the standard requirements.

- Testing Safety and Security:

+ Ensure that the communication system between electric vehicles and charging stations meets the safety and security requirements specified in the standard.

+ Test the security of communication data between the two devices.

- Testing Performance:

+ Evaluate the performance of communication, including data transmission speed, stability, and response time.

+ Ensure that communication does not cause significant delays during the charging process.

- Testing System:

+ Verify the correctness of hardware and software systems according to the standard requirements.

+ Test the functionality and compatibility of electric vehicles and charging stations when connecting and communicating with each other.

❖ **Standard number 5: ISO 15118-5:2018 standard "Road vehicles - Vehicle to grid communication interface - Part 5: Physical layer and data link layer conformance test"**

The testing will be carried out based on 4 criteria, including:

- Testing Communication Protocol:

+ Verify the compatibility of the communication protocol defined in the standard with electric vehicle and charging station devices.

+ Ensure that the charging station can understand and process communication signals sent from the electric vehicle accurately and in accordance with the standard requirements.

- Testing Charging and Charging Control:

+ Verify the correctness of the charging process controlled by the charging station, including requirements for the charging process, charging current, and environmental conditions.

+ Ensure that the charging station can monitor and adjust the charging process according to the requirements of the electric vehicle.

- Testing Safety and Security:

+ Ensure that the safety procedures and features specified in the standard are implemented correctly during the charging process.

+ Test the security of the charging station and its ability to resist attacks and security risks.

- Testing Performance:

+ Evaluate the performance of the charging station during the electric vehicle charging process, including charging speed, energy efficiency, and stability of the charging current.

+ Ensure that the charging station can operate efficiently and stably in various environmental conditions.

❖ **Standard number 6: ISO 15118-8:2020 standard "Road vehicles - Vehicle to grid communication interface - Part 8: Physical layer and data link layer requirements for wireless communication"**

The testing will be carried out based on 4 criteria, including:

- Testing Wireless Communication Protocol:

+ Verify the compatibility of the wireless communication protocol specified in the standard with electric vehicle devices and wireless charging systems.

+ Ensure that electric vehicles and wireless charging systems can transmit and receive communication data accurately and reliably.

- Testing Wireless Charging Process:

+ Test the correctness of the wireless charging process, including the startup process, energy transmission process, and charging termination process.

+ Ensure that the wireless charging system can monitor and adjust the charging process accurately and efficiently.

- Testing Performance and Safety:

+ Evaluate the performance of the wireless charging system, including charging speed, energy efficiency, and safety of the charging process.

+ Check the security and ability to prevent safety issues during wireless charging.

Testing Functionality and Compatibility:

+ Ensure that the wireless charging system can operate compatibly with various types of electric vehicles and different communication standards.

+ Verify the correctness of additional features such as environmental condition management and energy management.

- The specific requirements for testing the standard can be found in Appendix 4.

❖ **Standard number 7: ISO 15118-9:2020 standard "Road vehicles - Vehicle to grid communication interface - Part 9: Physical and data link layer conformance test for wireless communication"**

The testing will be carried out based on 5 criteria, including:

- Testing Network and Application Protocol Compatibility:

+ Identify and test the compatibility of network and application protocols according to ISO 15118-2:2022 and ISO 15118-3:2022 standards.

+ Ensure that network and application protocols operate efficiently and are compatible with each other in various usage scenarios.

- Testing Physical and Data Link Layer Compatibility:

+ Identify and test the compatibility of physical and data link layers according to ISO 15118-4:2022 and ISO 15118-5:2022 standards.

+ Ensure that the physical and data link layers meet the transmission and communication requirements between electric vehicles and charging stations.

- Testing Safety and Security:

+ Conduct tests to ensure that the electronic interface between electric vehicles and charging stations meets the safety and security requirements per ISO 15118-6:2022 standard.

+ Ensure that security measures such as encryption and authentication are properly implemented and effective.

- Testing Reliability and Performance:

+ Perform tests to evaluate the reliability and performance of the electronic interface under different conditions, including data transmission speed, latency, and stability.

+ Ensure that the interface operates stably and reliably in all situations.

- Testing Compatibility and Connectivity:

+ Verify the correctness of the connection and communication process between different devices, including electric vehicles and charging stations.

+ Ensure that the interface can connect and interact with various devices and systems flexibly.

❖ **Standard number 8. ISO 15118-20:2022 standard "Road vehicles — Vehicle to grid communication interface — Part 20: 2nd generation network layer and application layer requirements"**

The testing will be carried out based on 5 criteria, including:

- Testing Network and Application Protocol Compatibility:

+ Identify and test the compatibility of the network and application protocols according to ISO 15118-2:2022 and ISO 15118-3:2022 standards.

+ Ensure that the network and application protocols operate efficiently and are compatible with each other in various usage scenarios.

- Testing Physical and Data Link Layer Compatibility:

+ Identify and test the compatibility of the physical and data link layers according to ISO 15118-4:2022 and ISO 15118-5:2022 standards.

+ Ensure that the physical and data link layers meet the requirements for transmission and communication between electric vehicles and charging stations.

- Testing Safety and Security:

+ Conduct tests to ensure that the electronic interface between electric vehicles and charging stations meets safety and security requirements according to ISO 15118-6:2022 standard.

+ Ensure that security measures such as encryption and authentication are implemented correctly and operate effectively.

- Testing Reliability and Performance:

+ Perform tests to assess the reliability and performance of the electronic interface under various conditions, including data transmission speed, latency, and stability.

+ Ensure that the interface operates stably and reliably in all situations.

- Testing Compatibility and Connectivity:

+ Verify the correctness of the connection and communication process between different devices, including electric vehicles and charging stations.

+ Ensure that the interface can connect and interact with various devices and systems flexibly.

3. Research Report on Verification Content

Verification Process for Charging Stations

Verification is the activity of evaluating and confirming the measurement characteristics of equipment according to measurement technical requirements and implementing measurement control measures. This includes initial verification before use, periodic verification during use, and verification after repair.

Verification activities include:

3.1. Charging Station Testing

Purpose of Testing

Testing of charging stations is the process of inspecting and evaluating the technical and safety features of charging stations before they are put into use. Testing ensures that charging stations meet technical and safety standards as required by law.

Testing Steps

- Visual inspection: Assess the exterior of the charging station, including checking basic components such as the enclosure, cables, connectors, and display.
- Electrical feature testing: Input/output voltage: Ensure that the input and output voltage are within allowed limits.
- Current: Test the ability to provide continuous current and the maximum current of the charging station.
- Safety feature testing: Overcurrent and overvoltage protection: Ensure that the charging station has protective mechanisms in case of overcurrent or overvoltage.
- Short circuit protection: Test the automatic disconnection capability in the event of a short circuit.
- Environmental testing:
    + Temperature: Assess the performance of the charging station under different temperature conditions.
    + Humidity: Test the ability to withstand high humidity without being affected.
- Technology and Testing Equipment
    + Voltage and current testing equipment: Accurate voltage and current meters.
    + Electrical safety testing equipment: Simulators for overvoltage, overcurrent, and short circuit scenarios.
    + Environmental testing chamber: Simulate different temperature and humidity conditions.

3.2. Measuring Charging Stations

Purpose of Measurement

Measurement is the process of accurately determining the technical specifications of a charging station such as voltage, current, power, and other safety factors. Measurement ensures that these parameters comply with established standards.

Measurement Steps

Equipment preparation: Select and check the measurement equipment to ensure they are calibrated.

Conducting measurements:

- Voltage measurement: Use a voltmeter to determine the input and output voltages.
- Current measurement: Measure the current supplied by the charging station under different load levels.
- Power measurement: Use a power meter to determine the performance of the charging station.
- Safety feature measurement: Check safety protection features such as overcurrent, overvoltage, and short circuit protection.

Measurement Technology and Equipment

- Voltage and current meters: Precise measuring devices capable of quickly and accurately reading electrical parameters.
- Power meter: A high-accuracy device for measuring electrical power.
- Safety testing equipment: Specialized devices to test electrical safety features.

3.3. Calibration of Charging Stations

Purpose of Calibration

Calibration is the process of adjusting and retesting measuring devices to ensure their accuracy. Calibration ensures that measuring devices used in testing and measuring charging stations maintain high precision.

Calibration Steps

- Periodic inspection: Regularly inspect and calibrate measuring devices as specified.
- Calibration of equipment:

+ Equipment preparation: Use standard devices to calibrate measuring instruments.

+ Conducting calibration: Adjust measuring devices to ensure they accurately measure technical parameters.
+ Record results: Store calibration results for tracking and periodic inspection
+ Re-testing: After calibration, retest the equipment to ensure that it functions according to the calibrated specifications.

- Calibration Technology and Equipment

+ Standard equipment: High-accuracy devices that are internationally recognized for use as standards.
+ Calibration management software: Supports the storage and management of calibration results, ensuring accuracy and transparency.

The verification process for charging stations in Vietnam includes three main activities: testing, measuring, and calibration. Each activity has specific steps and requires the use of specialized equipment to ensure that charging stations operate safely and effectively. Adhering to this strict verification process will significantly contribute to the development of a sustainable electric transportation system and consumer protection.

4. Plan for Testing a Sample charging station

Based on the in-depth research process of experts and the comments of relevant parties in 2 working sessions and the cooperation support of Vinfast, the research team had a field trip to the Vinfast factory.

At the factory with the actual status of the factory, through the assessment of the expert team and the coordination of the factory, the team determined that Vinfast currently does not have a prototype of a wireless charging station that meets the developing standards. Therefore, the research team has proposed to study an existing prototype from Vinfast and develop a testing plan for the AC 3.5KW Portable Charging Station.

Based on studies and analyses of the AC 3.5KW portable charging station, the research team has outlined a preliminary plan for the testing phase, including the following content:

Test items (or inspection)		Clause or subclause/Standard	Test Unit	Test sequence		Sample Code	Duration (h)	Sample A	Sample B	Sample C
Marking General	Manual	6	VF-HN	A		#1	1h	x	x	x
Indelibility of marking	Supplier	9.3	Quatest1				4h	x	x	x
The strain on the conductors	Manual	9.22	VF-HN				1h	x	x	x
The torque exerted by IC-CPDs on fixed socket outlets	Supplier	9.23	VF				4h		x	x
Degree of protection of the function box(es)	Supplier	8.5.3	Quatest1				10h	x	x	x
Protection against electric shock	Need check	9.4	VF-HN				4h	x	x	x
Resistance to heat	MT Cabinet	9.11	VSM-Quatest1				4h		x	x
Clearances and creepage distances	Manual	8.4.3	VF-HN				4h	x	x	x
Resistance to tracking	Supplier	9.19	Quatest1				4h		x	x
Resistance to abnormal heat and fire	Supplier	9.12	Quatest1				4h		x	x
Insulation resistance of the main circuit	Hipot + MT Cabinet	9.5	VF-HN	B	B1	#2, #3, #4	4h	x	x	x
Dielectric strength of the main circuit	Hipot + MT Cabinet		VF-HN				4h	x	x	x
Insulation resistance and dielectric strength of auxiliary circuits	Hipot + MT Cabinet		VF-HN				4h	x	x	x

Verification of impulse withstand voltages (across clearances and solid insulation) and of leakage current across open contacts	Supplier		Quatest1				8h	x	x	x
Temperature rise	Thermal Camera & 15kW AC Load	9.6	VF-HN		B2	#5, #6, #7	8h	x	x	x
Reliability at 45°C	MT Cabinet + 15kW AC Load	9.17.2	VF-HN				672h	x	x	x
Aging	MT Cabinet + 15kW AC Load	9.18	VF-HN				168h	x	x	x
Test on pins provided with insulating sleeves		9.20	VF				1h	x	x	x
Tests of the pilot function	Commeso System	IEC TS 62763:2013 Table 4e	VF-HN				1h	x	x	x
Making and breaking the capacity of the plug of the IC-CPD		9.9.3	Supplier	C	C1	#8, #9, #10	1h	x	x	x
Mechanical and electrical endurance	Oscilloscope	9.8	VF-HN				8h		x	x
Mechanical strength of non-solid pins of plugs		9.21	Supplier				1h	x	x	x
One test of the pilot function chosen at random	Commeso System	IEC TS 62763:2013. Table 4e	VF-HN				1h	x	x	x
Tests of cord anchorage	Supplier	9.24	Quatest1		C2 b	#11	8h	x	x	x
Flexing test of non-rewirable IC-CPDs	Supplier	9.25	DTnC		C3 b	#12	8h	x	x	x
General	-	9.7.1	VF-HN	D	D0	#13, #14	1h	x	x	x
Test circuit	-	9.7.2	VF-HN				1h	x	x	x

Verification of the correct operation in case of a steady increase of the residual current	Oscilloscope + Pulse Generator	9.7.3.2	VF-HN				4h	x	x	x
Verification of the correct operation at closing on residual current	Oscilloscope + Pulse Generator	9.7.3.3	VF-HN				4h	x	x	x
Verification of the correct operation in case of the sudden appearance of residual current	Oscilloscope + Pulse Generator	9.7.3.4	VF-HN				4h	x	x	x
Verification of correct operation in case of sudden appearance of residual currents between 5 A and 100 A	Oscilloscope	9.7.3.5	VF-HN				4h	x	x	x
Verification of the correct operation with load at the reference temperature	Oscilloscope + Pulse Generator + 15kW AC Load + MT Cabinet	9.7.3.6	VF-HN				4h	x	x	x
Tests at the temperature limits	Oscilloscope + Pulse Generator + 15kW AC Load + MT Cabinet	9.7.3.7	VF-HN				8h	x	x	x
Verification of the correct operation at low ambient air temperatures of –25 °C	Oscilloscope + Pulse Generator + 15kW AC Load + MT Cabinet	9.7.3.8	VF-HN				120h	x	x	x
Verification of the correct operation with residual currents having a d.c. component	Oscilloscope + Pulse Generator	9.7.4	VF-HN				4h		x	x
Verification of behavior in case of composite residual current	Oscilloscope + Pulse Generator	9.7.5	VF-HN				4h		x	x

Verification of the correct operation in case of smooth d.c. residual current	Oscilloscope + Pulse Generator	9.7.6	VF-HN				4h	x	x	x
Miswiring and supply failure tests	Manual	9.7.7	VF-HN				4h	x	x	x
Verification that the protective conductor is connected to the electric vehicle	Oscilloscope + Pulse Generator	9.7.9	VF-HN				4h	x	x	x
Verification of standing current in the protective conductor connection in normal service	Fluke Meter	9.7.10	VF-HN				4h	x	x	x
Behavior in the case of failure of the supply voltage	Commeso System	9.14	VF-HN		D1	#15, #16, #17	4h	x	x	x
Unwanted tripping	Oscilloscope	9.16	VF-HN				4h		x	x
Performance at IΔm	Oscilloscope	9.9.2.3	VF-HN				4h		x	x
Residual current function by self-test	Manual	9.13	VF-HN				4h	x	x	x
Resistance to mechanical shock and impact	Supplier	9.10	VF/Quatest1				8h	x	x	x
Non-operating current under overcurrent conditions	15kW AC Load + Oscilloscope + Current Clamp	9.15	VF-HN				4h	x	x	x
Tests replacing verifications of creepage distances and clearances	Manual	9.27	VF-HN				8h	x	x	x
Verifications for single electronic components used in IC-CPDs	Manual	9.28	VF-HN				4h	x	x	x

Coordination at *I*nc Performance at *I*m One test of the pilot function chosen at random	Oscilloscope	9.9.2.4 a) 9.9.2.2 IEC TS 62763:2013. Table 4e	VF-HN	E	#18	24h		x	x
Coordination at *I*m Coordination at *I*Δc One test of the pilot function chosen at random	Oscilloscope	9.9.2.4 b) 9.9.2.4 c) IEC TS 62763. Table 4e	VF-HN	F	#19	24h		x	x
Low storage temperature test	MT Cabinet+ Pulse Generator + Ossiloscope	9.35	VF-HN	G	#20, #21, #22	24h	x	x	x
Reliability (climatic test)	MT Cabinet+ Pulse Generator + Oscilloscope	9.17.1	VF-HN			672h	x	x	x
One test of the pilot function chosen at random	Commeso System	IEC TS 62763:2013. Table 4e	VF-HN			1h	x	x	x
Harmonics, interharmonics		IEC 61543:1995 & IEC 61543:1995/AMD1:2004d. Table 4 -T1.1	DTnC	H	#23	2 weeks			
Signaling voltage		IEC 61543:1995 & IEC 61543:1995/AMD1:2004d. Table 4 -T1.2	DTnC			2 weeks			

Conducted unidirectional transients of the ms and μs time scale		IEC 61543:1995 & IEC 61543:1995/AMD1:2004d. Table 5 -T2.3	DTnC			2 weeks			
Conducted oscillatory voltages or currents		IEC 61543:1995 & IEC 61543:1995/AMD1:2004d. Table 5 -T2.1c and T2.5	DTnC	I	#24	2 weeks			
Conducted unidirectional transients of the ns time scale (burst)		IEC 61543:1995 & IEC 61543:1995/AMD1:2004d. Table 5 -T2.2	DTnC			2 weeks			
Conducted common mode disturbances in the frequency range lower than 150 kHz		IEC 61543:1995 & IEC 61543:1995/AMD2:2005d. Table 5 – T2.6c	VF-HN	J	#25	2 weeks			
Electrostatic discharges		IEC 61543:1995 & IEC 61543:1995/AMD1:2004d. Table 6 -T3.1	DTnC			2 weeks			
Heat test under solar radiation The conditions are under consideration.		9.30	VF-HP	K		500h	x	x	x
UV radiation	UV Equipment	9.31	VF-HL	L	#26, #27, #28	500h	x	x	x

Damp and salt mist	MT Cabinet + Salt Cabinet	9.32	VF-HL	M	#29, #30, #31	288h	x	x	x
Vehicle drive-over	Supplier	9.34	SGS	N	#32, #33, #34	8h	x	x	x
Chemical loads	Supplier	IEC TS 62763:2013. Table 4e 9.29	Việt Nga	O	#35, #36, #37	8h	x	x	x
Shock and vibration test	Shock + Vibration Machine	9.36	VF-HP	P	#38, #39, #40	48h	x	x	x
EMC - Immunity requirements		**Standard**		**Criteria**					
Enclosure-Electrostatic discharge (ESD)		IEC 61851-21-2	DTnC	B		2 weeks	x	x	x
Enclosure-Radiated RF fields (80 to 1000 MHz)		IEC 61851-21-2		A		2 weeks		x	x
Enclosure-Radiated RF fields (1,4 to 2 GHz)		IEC 61851-21-2		A		2 weeks		x	x
Enclosure-Radiated RF fields (2 to 2,7 GHz)		IEC 61851-21-2		A		2 weeks		x	x
Enclosure-Magnetic fields		IEC 61851-21-2		A		2 weeks		x	x
Power input(AC)-Electrical fast transient/bursts		IEC 61851-21-2	DTnC	B		2 weeks	x	x	x
Power input(AC)-Voltage surges		IEC 61851-21-2		B		2 weeks		x	x

Power input(AC)-Conducted RF fields		IEC 61851-21-2		A		2 weeks		x	x
Power input(AC)-Voltage dips and interruptions		IEC 61851-21-2		B e) B e) B e) C		2 weeks		x	x
Wired network and signal/ contro-Electrical fast transient/bursts		IEC 61851-21-2		B		2 weeks	N/A	N/A	N/A
Wired network and signal/control-Voltage surges		IEC 61851-21-2		B		2 weeks	N/A	N/A	N/A
Wired network and signal/control-Conducted RF fields		IEC 61851-21-2		A		2 weeks	N/A	N/A	N/A
CPT-Electrical fast transient/bursts		IEC 61851-21-2		B		2 weeks	N/A	N/A	N/A
CPT-Voltage surges		IEC 61851-21-2		B		2 weeks	N/A	N/A	N/A
CPT-Conducted RF fields		IEC 61851-21-2		A		2 weeks	N/A	N/A	N/A
EMC - Emission requirements									
Power input (AC)-Harmonic currents		IEC 61851-21-2	DTnC	B		2 weeks	x	x	x
Voltage fluctuations Band flicker		IEC 61851-21-2	DTnC	B		2 weeks	x	x	x
Power input (AC)-Conducted disturbances (0 kHz to 2 kHz)		IEC 61000-3	DTnC	B		2 weeks		x	x
Power input (AC)-Conducted disturbances (150 kHz to 30 MHz)		IEC 61851-21-2	DTnC	B		2 weeks	x	x	x

Power input (AC)-Conducted disturbances (150 kHz to 30 MHz)		IEC 61000-3	DTnC	B		2 weeks	x	x	x
CPT (LV AC or DC)-Conducted disturbances (150 kHz to 30 MHz)		IEC 61851-21-2	DTnC	B		2 weeks		x	x
Wired network and signal/control-conducted disturbances		IEC 61851-21-2	DTnC	B		2 weeks	N/A	N/A	N/A
Enclosure-Radiated disturbances (30MHz - 1GHz)		IEC 61851-21-2	DTnC	B		2 weeks	x	x	x
Enclosure-Radiated disturbances (1GHz - 6GHz)									
Enclosure-radiated disturbances (2kHz-185kHz)		IEC 61851-21-2	DTnC	B		2 weeks		x	x
CPT-Transient emissions		IEC 61851-21-2	DTnC	B		2 weeks	N/A	N/A	N/A

Annex 2: Financial report

Budget description	Total Budget (Adjusted budget)				2rd Period Budget			3rd Period Budget			4rd Period Budget			Comments/ Descriptions
	20 May 2023 - 30 September 2024				01 Jul to 31 Dec 2023			1 January to 30 April 2024			1 May to 30 September 2024			
calculation	Unit	#	Unit rate	# * Unit rate	#	Unit rate	# * Unit rate	#	Unit rate	# * Unit rate	#	Unit rate	# * Unit rate	
1. HUMAN RESOURCES				113,450			57,250			16,005			23,445	
1.1 please fill in list of positions funded by this project (one per line)				-			-			-				
1.2 please fill in list of consultants/retainers funded by this project (one per				28,130			12,490			4,675			7,615	
1.2.1 Technical Staff				21,320	12	2,485	11,190	2	3,060	2,050	5	3,060	4,780	
a. Senior experts	month	10	1,150	11,500	6.0	1,150	6,900	1.0	1,150	1,150	1.0	1,150	1,150	2 persons/standard
b. Junior experts	month	5	1,050	5,250	3.0	1,050	3,150	0.0	1,050	-	1.0	1,050	1,050	1 person/standard
c. Collecting data and documents	month	4	-	1,140	4.0	285	1,140			-				2 persons/standard
d.Compilating, editing, finalizing and making dossier of TCVNs	month	4	860	3,440			-	1.0	860	860	3.0	860	2,580	2 persons/standard
1.2.2 Administrative Staff				6,800	34	110	1,200	72	110	2,665	79	110	2,835	
a.Project manager	day	64	50	3,200	14	50	700	26	50	1,300	24	50	1,200	
b.Project assistant	day	60	30	1,800	10	30	300	26	30	780	24	30	720	
c.Project accountant	day	60	30	1,800	10	30	300	19.5	30	585	31	30	915	
1.3 please fill in list of shared resources positions (one per line)				85,320	52	2,485	44,760	12	3,060	11,330	16	3,060	15,830	
a. Senior experts	month	40	1,150	46,000	24.0	1,150	27,600	2.5	1,150	2,875	5.5	1,150	6,325	2 persons/standard
b. Junior experts	month	20	1,050	21,000	12.0	1,050	12,600	1.5	1,050	1,575	2.5	1,050	2,625	1 person/standard
c. Collecting data and documents	month	16	-	4,560	16.0	285	4,560	-		-			-	2 persons/standard
d.Compilating, editing, finalizing and making dossier of TCVNs	month	16	860	13,760			-	8.0	860	6,880	8	860	6,880	2 persons/standard
2. OFFICE COSTS, EQUIPMENT AND SUPPLIES				-			-			-				
2.1 please fill in details of all equipment and supplies needed for the project				-			-			-				
3. PROGRAMME COSTS				27,000			6,000			-			15,000	
3.1. Training/Seminars/Workshops (please list planned items)				15,000	-	-	-	-	-	-	3	5,000	15,000	
a. 01 consultancy workshop		-		-			-			-				
b.03 dissemminate National Workshops for standards	Wokshop	3		15,000				-	-	-	3	5,000	15,000	
c.03 training courses	Course	-		-			-			-				
3.2 Travel (please provide details of planned travels)				-			-			-				
3.3 Contracts (please provide details of contracts)				12,000			6,000			-			-	
a. Translation contracts	Page	1,000	12	12,000	500	12	6,000			-				
4. OTHER COSTS				6,125	-	-	464	-	-	-	-	-	5,621	
4.1 please fill in details of any other costs				6,125			464			-			5,621	
a. In-depth report	report	1	5,470	5,470	-	-	-			-	1	5,470	5,470	1 in-depth report (the total amount is USD 16,410 and BLT paid 2/3 of the amount which equal to USD 10,940 and ETP paid 1/3 of the amount which equal to USD 5,470)
b.Administrative expens (Stationary and Consumables, printing, Guest cost,	month	3	655	655	1.0	464	464		-	-	1	151	151	
5. Contingency (max. 5%)														
6. TOTAL DIRECT COSTS				146,575	-	-	63,714	-	-	16,005	-	-	44,066	146,575
6. Grand Total				146,575			43%			11%			30%	

Budget description	Total Budget (Adjusted budget)	Budget for this reporting period	Expenditure in this Reporting Period	over/under spent	Variance	Budget for this reporting period	Expenditure in this Reporting Period	over/under spent	Variance	Expenditure in previous reporting periods	Total Expenditure	Progress against budget	Provide comment on over and under variation of expenditure if variance is more than 10% in column (e)
Dates	20 May 2023 - 30 September 2024	01 July to 31 December 2023				01 January to 30 April 2024				cummulative performance start date of project to current reporting period			
calculation	a	b	c	d=b-c	e=c/b	b	c	d=b-c	e=c/b	f	g=f+c	h=g/a	
1. HUMAN RESOURCES	113,450	57,250	57,250	-	100%	16,005	16,005	-	100%	74,000	90,005	79%	
1.1 ... please fill in list of positions funded by this project (one per	***21,230***	***11,190***	***11,190***	-	100%	2,010	2,010	-	100%	14,540	16,550	78%	
a. Senior experts	11,500	6,900	6,900	-	100%	1,150	1,150	-	100%	9,200	10,350	90%	
b. Junior experts	5,250	3,150	3,150	-	100%	-	-	-	-	4,200	4,200	80%	
c. Collecting data and documents	1,140	1,140	1,140	-	100%	-	-	-	-	1,140	1,140	100%	
d.Compilating, editing, finalizing and making dossier of TCVNs	3,440	-	-	-	-	860	860	-	100%	-	860	25%	
1.2 ... please fill in list of consultants/retainers funded by this	6,800	1,300	1,300	-	100%	2,665	2,665	-	100%	1,300	3,965	58%	
a.Project manager	3,200	700	700	-	100%	1,300	1,300	-	100%	700	2,000	63%	
b.Project assistant	1,800	300	300	-	100%	780	780	-	100%	300	1,080	60%	
c.Project accountant	1,800	300	300	-	100%	585	585	-	100%	300	885	49%	
1.3 .. please fill in list of shared resources positions (one per line)	85,220	44,760	44,760	-	100%	11,330	11,330	-	100%	58,160	69,490	81%	
a. Senior experts	46,000	27,600	27,600	-	100%	2,875	2,875	-	100%	36,800	39,675	86%	
b. Junior experts	21,000	12,600	12,600	-	100%	1,575	1,575	-	100%	16,800	18,375	88%	
c. Collecting data and documents	4,560	4,560	4,560	-	100%	-	-	-	-	4,560	4,560	100%	
d.Compilating, editing, finalizing and making dossier of TCVNs	13,760			-	-	6,880	6,880	-	100%	-	6,880	50%	
2. OFFICE COSTS, EQUIPMENT AND SUPPLIES	-	-	-	-	-	-	-	-	-	-	-	-	
2.1 ... please fill in details of all equipment and supplies needed for				-	-	-	-		-	-	-	-	
3. PROGRAMME COSTS	27,000	6,000	6,000	-	100%	-	-	-	-	12,000	12,000	44%	
3.1. Training/Seminars/Workshops (please list planned items)	15,000	-	-	-	-	-	-	-	-	-	-	-	
a. 01 consultancy workshop	-	-	-	-	-	-	-	-	-	-	-	-	
b.03 dissemminate National Workshops for standards	15,000	-	-	-	-	-	-	-	-	-	-	-	
c.03 training courses	-	-	-	-	-	-	-	-	-	-	-	-	
3.2 Travel (please provide details of planned travels)		-	-	-	-	-	-	-	-	-	-	-	
3.3 Contracts (please provide details of contracts)	12,000	6,000	6,000	-	100%		-	-	-	12,000	12,000	100%	
a. Translation contracts	12,000	6,000	6,000	-	100%	-	-	-	-	12,000	12,000	100%	
4. OTHER COSTS	6,125	615	464	151	75%	-	-	-	-	504	504	8%	
4.1..... please fill in details of any other costs	6,125	615	464	151	75%	-	-	-	-	504	504	8%	
a. 1 in-depth report	5,470	-	-	-	-	-	-	-	-	-	-	-	1 in-depth report (the total amount is USD 16,410 and BLT paid 2/3 of the amount which equal to USD 10,940 and ETP paid 1/3 of the amount which equal to USD 5,470)
b.Administrative expens (Stationary and Consumables, printing, Guest cost, etc.,)	655	615.0	464	151.0	75%	-	-	-	-	504	504	77%	Transfer fee, account management fee, stationery .....
5. Contingency (max. 5%)	-	-	-	-	-	-	-	-	-	-	-	-	
6. *TOTAL DIRECT COSTS*	146,575	63,865	63,714	151	99.76%	16,005	16,005	-	100%	86,504	102,509	70%	
7. Grand Total	146,575	63,865	63,714	151	99.76%	16,005	16,005	-	100.00%	86,504	102,509	70%	

Funds Received vs Expenditures			
Funds Received:	**Amount**	**Date received**	
8% bridging fund if applicable	0		
1st Fund Request	22,750		
2nd Fund Request	39,875		
3rd Fund Request	39,875		
Total Received	**102,500**		
Total expenditure per reporting period	**Amount**	**Dates from - to**	
Current reporting period	16,005	Reporting Period:	20 May 2023 to 30 April 2024
Previous reporting period:	63,714		
Previous reporting period:	22,790		
Previous reporting period:	-		
Total Expenditure	**102,509**		
-			
-	**Amount**	**Description**	
Other income earned for the entire duration			
other income	0		
Total other income	**0**		

Summary			
Budget	**$**	**146,575**	
Funds received	$	102,500	
Expenditure	$	102,509	
Balance	$	-9	
Other Income	$	-	
Fund Surplus/Deficit:	$	-9	
Total Balance (Budget - Expenditure)	$	44,066.00	

Implementation Rate (annual budget/annual expenditure)	97.372%	*ref details sheet, column (e)*	
Progress Rate (total budget against total expenditure)	70%	*ref details sheet, column (h)*	

Annex 3: Meeting minutes Technical Support "Development of 08 National Standards for electric vehicle charging station infrastructure in Vietnam"

1. **Program Content**

ETP/UNPOS supports the Directorate in the development and issuance of 08 national standards related to electric vehicle charging stations in Vietnam.

2. **Objectives:**

To consult with stakeholders on the current state of research, production, and operation of the electric vehicle system in general and the charging station system in particular. Addressing the issues and challenges of the current charging station system in Vietnam. From there, **develop a comprehensive set of national standards for electric vehicle charging stations following the government's process for developing and approving national standards issued by the Ministry of Science and Technology.**

3. **Necessity:**

At the meeting presenting the draft content of the 08 Standards before the Directorate for Standards, Metrology, and Quality (Standards Department and Standards Institute), representatives commented: "The development of 08 standards for charging stations is necessary for the development of vehicles using clean energy, renewable energy and also contributes step by step towards Vietnam's commitment to achieving net-zero emissions by 2050."

The development of these standards is significant and impacts many stakeholders, directly affecting social life. Therefore, we have organized a consultation meeting with stakeholders on the 08 TCVN standards being developed.

4. **Location and time of the workshop:**

- **Location:** Movenpick Hotel, 83 Ly Thuong Kiet, Hai Ba Trung, Hanoi
- **Time:** From 08:30 – 11:30, May 15, 2024

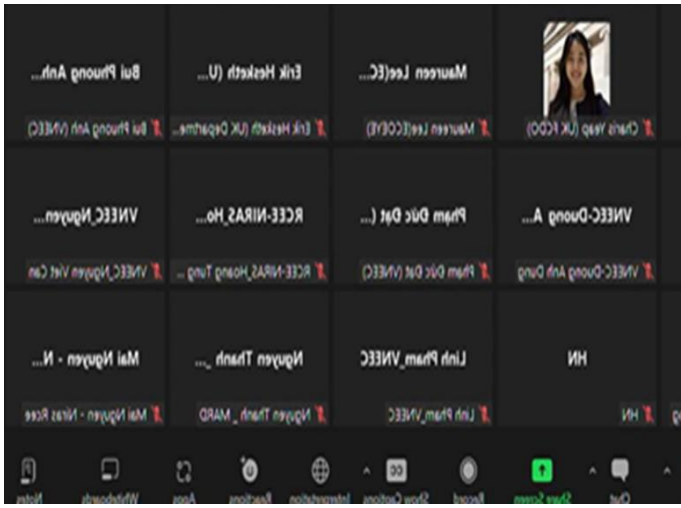
5. **Participants**:

- Project representatives

- Stakeholder representatives: A Chau Joint Stock Company, University of Transport and Communications, Technical experts, User representatives:

  + Attending in person: 35 people

  + Attending online: 30 people



6. Workshop Details

Time	Content	Speaker
8:30 – 9:00	Guest welcome and registration	
9:00 – 9:15	Opening remarks	Project Leader
9:15 – 9:30	Group photo session	
9:30 – 10:00	Topic 1: Overview of the technical support program for "Development of 08 National Standards on Electric Vehicle Charging Station Infrastructure in Vietnam"	Ms. Dang Ngoc Hien - CEO of Bao Loc Technology Joint Stock Company (BLT.cert) - Project Manager and Coordinator
10:00 – 10:15	Break	
10:15 – 10:45	Topic 2: Global experiences in electric vehicle development & charging stations	Mr. Hoang Quoc Vuong – Vice Director of Bao Loc Technology Joint Stock Company (BLT.cert)
10:45 – 11:15	Topic 3: Processes and methods for developing National standards	Mr. Pho Duc Son – Head of the National Standards Drafting Team
11:15 – 11:30	Q&A session	
11:30 – 11:35	Closing remarks	Representative of Bao Loc Technology Joint Stock Company (BLT.cert)

11h30 –13h00	Lunch	All organizing committee members and guests

7. **Presentation Content at the Workshop:**

Ms. Dang Ngoc Hien, CEO of Bao Loc Technology Joint Stock Company (BLT.cert) - Project Manager and Coordinator presents Topic 1: Introduction to the project for "Development of 08 National Standards on Electric Vehicle Charging Station Infrastructure in Vietnam".

The presentation covers:

- The necessity for Vietnam's government support in issuing 08 National Standards for electric vehicle charging stations.
- Objectives of the program.
- Overview of the technical support program.
- The importance of developing TCVN for charging stations in Vietnam
- Scope of application of the 08 standards

Mr. Hoang Quoc Vuong – Vice Director of Bao Loc Technology Joint Stock Company (BLT.cert), presents Topic 2: Experiences in electric vehicle and charging station development globally.

The presentation addresses:

- General context introduction.
- Development of charging station systems in Europe: Current distribution of charging systems.
- Development of charging station systems in the USA.
- Development of charging station systems in China

Mr. Pho Duc Son – Head of the TCVN Drafting Team presents Topic 3: Processes and methods for developing TCVN standards.

The presentation includes:

The process and methods for developing TCVN include six main components:

- General issues in national standards development.
- Responsibilities for the development, review, and publication of national standards.
- Sequence and procedures for development, review, and publication of national standards.
- Methods for developing national standards.
- Presentation and representation of national standards content.
- Application of national standards.

8. Expert Consultation Workshop and Delegate Participation

No.	Name	Question	Response
1	Ms. Tran Kim Thoa	Why did the project choose the above 08 ISOs to develop into national standards and not other ISO standards?	Among the 60 ISO standards for charging stations/pillars, there are 16 primary standards and 44 secondary standards. These 08 proposed standards are among the primary ones. Currently, there are 11 TCVN standards for electric vehicle charging stations in Vietnam, including 09 TCVN for charging stations and 02 TCVN for electric vehicle battery swapping. We hope ETP will continue to sponsor the Vietnamese government to comprehensively develop the TCVN system for electric vehicle pillars.
2	Ms. Le Thi Kim Thanh	As far as I know, to implement these 08 National Standards, the	Throughout the project implementation, during the research and actual surveys

		project unit fully approves equivalent international standards, so does testing for compatibility within each standard require retesting, or is it also fully accepted based on the results of the corresponding international standards?	(domestically and internationally), we assessed that the technical and infrastructure capabilities in Vietnam related to the development of charging station projects and testing capabilities for these standards are very weak or almost non-existent. Therefore, we plan to fully accept the test results and concurrently, we will assess the compatibility of the charging stations with electric vehicles (if approved by the sponsoring entity).
3		How suitable are foreign standards compared to the context of Vietnam?	Building 08 standards for charging stations may not directly reduce emissions in the transportation sector but is a significant component in efforts to build infrastructure to support Vietnam's green transportation goals, encouraging the use of electric vehicles and contributing to Vietnam's greenhouse gas emission reduction targets (52.4 million tons in 2030 and 106.2 million tons in 2050).

9. The Project Representative delivers the closing remarks at the workshop

Closing remark by Mr. Hoang Quoc Vuong, Vice Director of the BLT.cert:

Through the workshop, we had frank exchanges and gained a lot of new and important information. I appreciated the sharing experience of international experts. After the workshop, we need to sit down to design follow-up activities. Thanks to the experts and the consultant for sharing valuable information and experience from international countries. Thanks to UNOPS-ETP, Asia Joint Stock Company, University of Transport and Communications, and related parties for joining the discussion to raise our knowledge. I would like to respectfully close the workshop!

Slides presented during the workshop: Overview of the Requirements

INTRODUCTION

PROGRAM FOR IMPLEMENTING TECHNICAL SUPPORT ACTIVITIES "DEVELOPING 08 NATIONAL STANDARDS FOR ELECTRIC VEHICLE CHARGING INFRASTRUCTURE IN VIETNAM"

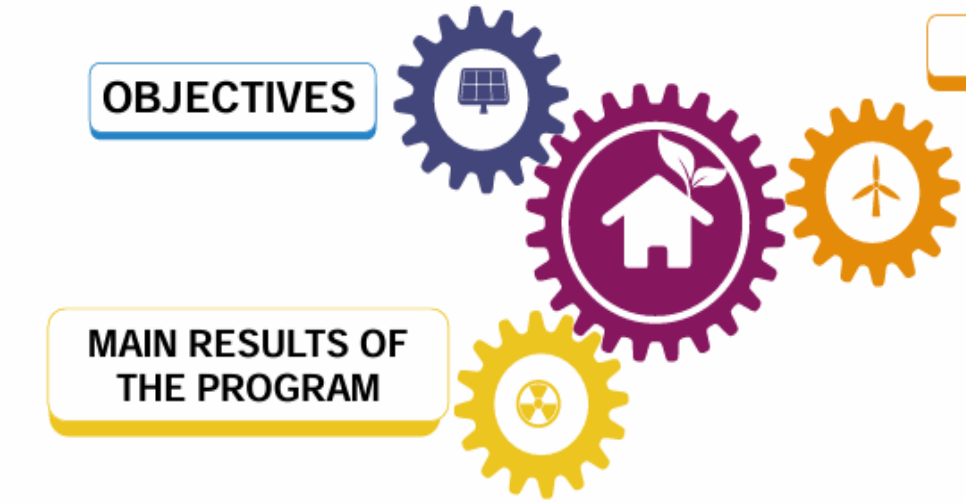
Presenter: Ms. Dang Ngoc Hien
Project Management and Coordination Officer
Ha Noi, 15/05/2024

1

CONTENT

- Introduction to the context of the technical support program
- Products and Implementation Progress
- Introduction of the Implementing Organization

2



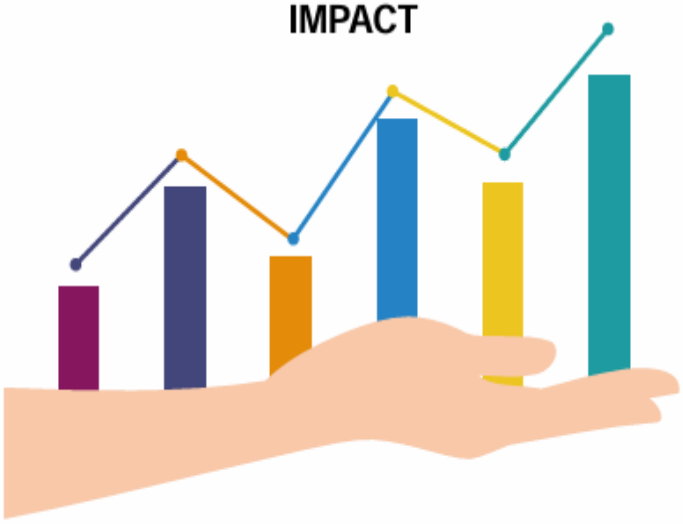
3

PROJECT OBJECTIVES

- ✓ The development of national standards for electric vehicle charging infrastructure is crucial in creating a legal and technical framework to ensure the safe and quality development of electric vehicle charging infrastructure. This supports the development of the local supply chain, controls the quality of domestic and imported products, and creates a level playing field for electric vehicle manufacturers and electric charging infrastructure providers.

4

IMPACT



Contributing to the foundation for the development of official standards for electric vehicle charging stations in Vietnam

The development of key standards for public electric charging station systems is a crucial step in improving the quality and safety of existing charging stations in Vietnam. Once the standards are fully developed, it will promote the expansion of the electric charging station network nationwide.

5

MAIN RESULTS OF THE PROGRAM

Main results of the program: • Comprehensive research and drafting of National Standards for electric vehicle charging stations • Development of National Standards with close consultation from domestic and international technical experts with the support of STAMEQ • **Organization of consultation meeting programs • Study, learn, and evaluate the feasibility of National Standards** with international laboratories • Implementation of steps to develop the national standard set (TCVN) in accordance with the regulations of the Vietnam Law on Standards and Technical Regulations and Circular 11/2021/TT-BKHCN of the Ministry of Science and Technology.

6

1. Introduction and Background of the Program

Electric vehicle charging station in Vietnam

In the context of increasingly severe air pollution, electric vehicles are an inevitable trend in the global automotive industry, and Vietnam is no exception. To achieve the commitment to net-zero emissions, developing green and smart transportation is the right and sustainable direction for any country in the world. Therefore, the development of vehicles using clean and renewable energy gradually contributes to Vietnam's commitment to reaching net-zero emissions by 2050.

Many electric vehicle (EV) users are currently uneasy about traveling from one province to another due to the sparse charging station network. Therefore, developing infrastructure to support the electric vehicle market is a major concern not only for the government but also for businesses and citizens with EV needs.

7

1. Introduction and Background of the Program

Current Barrier of the Lack of Electric Vehicle Charging Station Standards

One of the biggest challenges for the development of electric vehicles in Vietnam is the lack of charging infrastructure. Although VinFast (the leading unit in the development of electric vehicle systems in Vietnam) has plans to install hundreds of thousands of charging stations nationwide, the lack of standardization between types of plugs and charging ports creates a major barrier. Each type of electric vehicle from different manufacturers may require a different type of charging port, making charging more complicated and less convenient.

Developers of the project must apply international standards and follow the approval procedures for these standards to meet regulatory requirements.

Therefore, it is essential to have a comprehensive national standard for charging stations to facilitate electric vehicle manufacturers in Vietnam.

8

1. Introduction and Background of the Program

Project Objectives

The main objective of this project is to develop a comprehensive national standard for the evaluation of foreign languages, in accordance with government procedures for the creation and approval of national standards issued by the Ministry of Science and Technology

The project is an initiative of ETP in coordination with the Directorate for Standards, Metrology, and Quality (STAMEQ) under the Ministry of Science and Technology (MOST).

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2. General Introduction to the Technical Support Program

As an initiative of the United Nations Office for Project Services (UNOPS), the Energy Transition Partnership (ETP) in Southeast Asia collaborates with the Directorate for Standards, Metrology, and Quality (STAMEQ) under the Ministry of Science and Technology (MOST) to establish a comprehensive national standard for electric vehicle charging stations in Vietnam.

Currently, Vietnam does not have a comprehensive national standard for electric vehicle charging stations.

This project aligns with the goal of developing clean energy and renewable energy vehicles, gradually contributing to Vietnam's commitment to achieving net-zero emissions by 2050

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Program Scope

The main objective of this project is to develop a comprehensive national standard for electric vehicle charging stations according to regulations, in compliance with the Government's procedures for the development and approval of national standards issued by the Ministry of Science and Technology

To achieve the above objective, the program will implement the following main activities:

1. Comprehensively research and implement the development of 08 national standards (TCVN) for electric vehicle charging stations

2. Develop the national standards (TCVN) with close consultation from domestic and international technical experts, along with the support of STAMEQ.

3. Organize consultation meetings

4. Research and analyze the testability of these national standards.

5. Implement the steps to develop the national standards (TCVN) in accordance with the regulations of the Law on Standards and Technical Regulations of Vietnam and Circular 11/2021/TT-BKHCN of the Ministry of Science and Technology

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The necessity of National Standards for electric vehicle charging stations in Vietnam

The necessity of national standards for electric vehicle charging stations to facilitate the development of the electric vehicle system in Vietnam, encouraging the participation and contribution of enterprises and relevant organizations in the development of TCVN and QCVN standards, thereby:

- Enhance the coordination between manufacturers, import units, businesses, and distributors with media units and relevant agencies... to promote and disseminate the existing TCVN and QCVN systems.
- There needs to be proactive participation and greater collaboration from the community of electric vehicle manufacturers, assemblers, importers, and businesses to have strong resources, capable of reviewing, updating, supplementing, building, and perfecting the TCVN and QCVN systems for electric vehicles in Vietnam.

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The necessity of National Standards for electric vehicle charging stations in Vietnam

National Standards (TCVN) will play a role:

- As a reference document for investors and regulatory agencies in the process of applying for permits, appraising, and accepting projects;
- Guidance for designers, manufacturers, suppliers to control risks during operation.

A comprehensive set of standards for charging stations will:

- Ensure consistent quality of projects, ensuring safety and community benefits
- Facilitate the deployment of renewable energy in Vietnam as planned in the development of the electric vehicle system in Vietnam and contribute to achieving the commitment to net-zero emissions by 2050 as pledged by the Prime Minister at the COP 26.

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3. Scope of application of 08 standards

Scope of application of the ISO 15118-1:2015 standard

This standard is the basis for other parts of the ISO 15118 series, specifying terms and definitions, general requirements, and use cases for both conductive and wireless High-Level Communication (HLC) between the Electric Vehicle Communication Controller (EVCC) and the Supply Equipment Communication Controller (SECC).

Scope of application of the ISO 15118-2:2015 standard

This part of ISO 15118 specifies the communication between battery electric vehicles (BEVs) or plug-in hybrid electric vehicles (PHEVs) and the electric vehicle supply equipment (EVSE). The application layer message set defined in this part of ISO 15118 is designed to support energy transfer from the EVSE to the EV. ISO 15118-1 contains additional use case elements (identified in Use Case Part 1: F4 and F5) describing the process of bidirectional energy transfer.

14

Scope of application of the ISO 15118-3:2015 standard

This part of the ISO 15118 standard specifies the requirements for the physical layer and data link layer for high-level communication, directly between battery electric vehicles (BEVs) or plug-in hybrid electric vehicles (PHEVs), referred to as EVs (electric vehicles) [ISO-1], based on wired communication technology and fixed charging installations [Electric Vehicle Supply Equipment (EVSE)] used in addition to basic signaling, as defined in [IEC-1]

Scope of application of the ISO 15118-4:2015 standard

This standard applies to conformance testing in the form of an abstract test suite (ATS) for a system under test (SUT) implementing an EVCC or SECC according to ISO 15118-2. These conformance tests specify testing of the capabilities and behavior of an SUT and inspect the observable behavior based on the conformance requirements applied in ISO 15118-2 and what the supplier declares about the implementation capabilities of the SUT.

15

Scope of application of the ISO 15118-5:2015 standard

This document specifies interoperability tests in the form of an Abstract Test Suite (ATS) for a System Under Test (SUT) implementing the Electric Vehicle Communication Controller (EVCC) or Supply Equipment Communication Controller (SECC) with support for High-Level Communication (HLC) based on PLC and basic signaling as per ISO 15118-3. These interoperability tests specify testing of the capabilities and behavior of the SUT and testing of what is observed based on the interoperability requirements specified in ISO 15118-3 and based on what the implementer declares about the capabilities of the SUT implementation.

Scope of application of the ISO 15118-8:2015 standard

This standard specifies the requirements for the physical layer and data link layer of wireless High-Level Communication (HLC) between electric vehicles (EVs) and electric vehicle supply equipment (EVSE). Wireless communication technology is used as an alternative to the wired communication technology specified in ISO 15118-3.

16

Scope of application of the ISO 15118-9:2015 standard

This document specifies interoperability tests in the form of an Abstract Test Suite (ATS) for a System Under Test (SUT) implementing the Electric Vehicle Communication Controller (EVCC) or Supply Equipment Communication Controller (SECC) with support for High-Level Communication (HLC) based on WLAN as per ISO 15118-8 and based on the foundation of ISO 15118-1. These interoperability tests specify testing of the capabilities and behavior of an SUT and inspecting what is observed based on the interoperability requirements specified in ISO 15118-8 and what the implementer declares about the capabilities of the SUT implementation.

17

Scope of application of the ISO 15118-20:2022 standard

This standard specifies communication between electric vehicles (EVs) (including battery electric vehicles (BEVs) and plug-in hybrid electric vehicles (PHEVs)) and electric vehicle supply equipment (EVSE).

The application layer messages defined in this document are designed to support the transfer of electric energy between EV and EVSE.

This standard defines communication messages and sequence requirements for bidirectional electric energy transfer.

Additionally, this standard defines wireless communication requirements for both conductive charging and wireless charging, as well as communication requirements for automatic connection devices and services for charge status information and control.

18

Reason for Adjusting the Number of National Standards

According to the agreement signed between ETP (UNPOS) and BLT.cert, it was anticipated that 09 National Standards would be developed and issued.

However, during a meeting with the Directorate for Standards, Metrology and Quality (STAMEQ), after seeking opinions from relevant parties, the STAMEQ representative agreed:

- To approve the implementation of 8 National Standards instead of 09 National Standards (as originally agreed).
- One TCVN (ISO/DIS 15118-21:2024) will be developed when ISO 15118-21:2024 is officially issued (since ISO is currently in the DIS stage, not yet a PUBLISHED version, and it will undergo many changes before the final version is released).

(Attached is a link to the ISO with information about the standard currently under development: https://www.iso.org/standard/84170.html)

19

IMPLEMENTATION ORGANIZATION

Bao Loc Technology Joint Stock Company (BLT.cert)

Small and Medium Enterprise Development Support Center SMEDEC 2

20

21

Slides presented during the workshop: Experience in Developing EV and EV charging stations around the world

EXPERIENCE IN DEVELOPING ELECTRIC VEHICLES & ELECTRIC VEHICLE CHARGING STATIONS AROUND THE WORLD

1

BACKGROUND

Climate change is causing unprecedented natural disasters and disasters around the world. The average temperature in the world has warmed by 1.1°C and increased rapidly to a red alert level, possibly will surpass the 1.5°C mark in the next two decades. According to this warning, if governments around the world do not take drastic action to cut emissions immediately, much of the Earth will suffer a climate disaster in the near future.

2

BACKGROUND

The 26th Conference of the Parties to the United Nations Framework Convention on Climate Change (The United Nations Climate Change Conference of the Parties - COP26) is expected to make progress on carbon emissions trading regulations and its future. Hybrid escape from coal.

Developing electric vehicles and charging stations also contributes significantly to reducing greenhouse gas emissions globally.

3

1. DEVELOPMENT OF CHARGING STATIONS IN EUROPE

Developing charging stations in Europe is a prerequisite for popularizing electric vehicles. With the ambition to reduce greenhouse gas emissions by at least 50% by 2030, the EU has proposed strategies to build 6 million charging stations in Europe. Currently, the countries belonging to the Union are achieving certain achievements towards common goals. Therefore, the charging station network in EU countries is heavily invested, of which the Netherlands accounts for 1/4 of the total.

4

CURRENT STATUS OF CHARGING STATION SYSTEM DISTRIBUTION IN EUROPE

According to statistics from ACEA - European Industry Association, the number of electric vehicle charging stations in this area currently reaches 225 thousand. Of which three countries, the Netherlands, France and Germany, account for 70%. The fourth position belongs to Italy with 13,073 charging stations, accounting for 6%.

More specifically, the Netherlands has only 0.8% of the total area of Europe but has built the number of charging stations for electric vehicles accounting for 29.7% of the entire region. Meanwhile, Romania, which accounts for 5.8% of the area, currently has only 493 charging posts, about 0.2%. Thus, ACEA's assessment of the uneven distribution and development of charging stations in Europe is completely accurate. This is also one of the biggest factors limiting development and making it difficult to travel by electric vehicle in this continent.

5

CURRENT STATUS OF CHARGING STATION SYSTEM DISTRIBUTION IN EUROPE

The Netherlands is the leading country in the total number of charging stations in Europe.

With many advantages, from economics to policy, the Netherlands has become the country with the most electric car charging points in the EU. According to industry association ACEA, the number of charging stations in the Netherlands is about 66,665, accounting for 30% of the total number of charging stations in Europe.

Together with the government's efforts, the Netherlands promises to not only be the country that accounts for a quarter of the total number of charging stations in Europe but will also continue to be at the forefront of the development and popularization of electric vehicles in the European Union. Europe in particular and the world in general.

6

2. DEVELOPING ELECTRIC VEHICLES & CHARGING STATIONS IN THE US

In order to develop electric cars, researching and applying policies of different countries is extremely important. In the report proposing policies to support conversion to electric cars from the Ministry of Transport to the Government in 2023, the electric vehicle development policies of some countries, including the United States, were mentioned.

The US is a country with many electric vehicle development policies. One of the earliest US efforts to encourage the use of electric vehicles was the Energy Policy Act of 1992, which encouraged the use of alternative energy (including electricity) through mandatory and voluntary approaches.

7

2. DEVELOPING ELECTRIC VEHICLES & CHARGING STATIONS IN THE US

The United States has passed several laws supporting the development of electric vehicles and charging stations. The 2021 Bipartisan Infrastructure Act (BIL) established the "NEVI Formula" Program to build infrastructure networks. Nationwide electric vehicle charging with a focus on accessibility, reliability and data collection.

Since then, the US has passed a number of laws supporting the development of electric vehicles and charging stations, with the 2021 Bipartisan Infrastructure Act (BIL) establishing the "NEVI Formula" Program to build a network of facilities. Nationwide electric vehicle charging infrastructure with a focus on accessibility, reliability and data collection.

8

2. DEVELOPING ELECTRIC VEHICLES & CHARGING STATIONS IN THE US

In February 2023, the US federal government issued comprehensive national electric vehicle charging standards and requirements for federally funded electric vehicle chargers in five areas including:

✓Installation, operation and maintenance of electric vehicle infrastructure by qualified technicians;

✓ Charging infrastructure compatibility;

✓ Traffic control equipment and signs on site;

✓ Request data related to electric vehicle charging projects;

✓ Networking of charging infrastructure

9

2. DEVELOPING ELECTRIC VEHICLES & CHARGING STATIONS IN THE US

In August 2022, the Inflationary Reduction Act (IRA) was passed, which included various grant programs and tax incentives to meet the goal of building a clean energy economy.

The US has a number of programs to support the development of charging infrastructure in line with the goal of building a network of 500,000 charging stations nationwide by 2030.

10

2. DEVELOPING ELECTRIC VEHICLES & CHARGING STATIONS IN THE US

The BIL program allocates US$7.5 billion for the period up to 2026 to develop the national charging network.

Of the $7.5 billion, $5 billion will be disbursed through the NEVI Formula Program to states, cities, counties and transit agencies.

The BIL program also provides $2.5 billion for a fueling and charging infrastructure grant program run by the U.S. Department of Transportation to build charging infrastructure in community areas, e.g. such as public roads, schools, parks and parking lots, as well as along major transportation corridors.

11

3. DEVELOPMENT OF ELECTRIC VEHICLES & CHARGING STATIONS IN CHINA

In the past few years, China has demonstrated to the world its ability and ambition to lead the global electric vehicle market with impressive achievements. One of the keys to unlocking the success of the electric car industry in China is strong support for the development of charging station infrastructure, which partly stimulates demand for electric vehicles and creates peace of mind. for consumers.

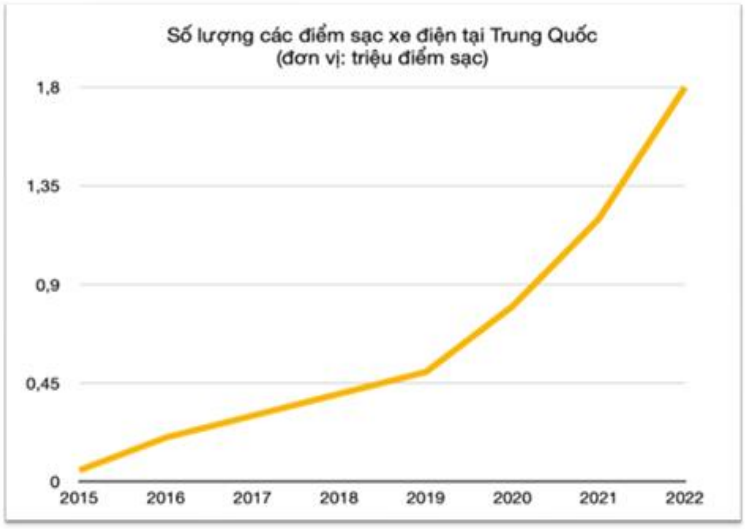
12

3. DEVELOPMENT OF ELECTRIC VEHICLES & CHARGING STATIONS IN CHINA

China has established and implemented a national policy on public charging station construction since 2014. Over the past decade, China has rapidly developed its public fast charging network. Currently, China has more than 309,000 public fast charging plugs (each plug meets the needs of 12 electric vehicles in the country).

13

3. DEVELOPMENT OF ELECTRIC VEHICLES & CHARGING STATIONS IN CHINA



14

3. DEVELOPMENT OF ELECTRIC VEHICLES & CHARGING STATIONS IN CHINA

Huawei Technologies plans to install 100,000 fast-charging stations for electric vehicles in China this year, including stations that charge more than twice as fast as Tesla's, providing infrastructure that can boost China's fast-charging vehicles. Chinese auto manufacturers.

15

3. DEVELOPMENT OF ELECTRIC VEHICLES & CHARGING STATIONS IN CHINA

According to the German Organization for International Cooperation (GIZ), China has issued an electric vehicle development target for the period 2021 - 2030 and to support its implementation; Related regulations have been established, especially planning for charging station systems on roads, regulations on investment in construction of charging station infrastructure, and specific requirements on parking locations with charging stations. (At least 10% of parking spaces must have charging stations), giving priority to fast, high-capacity charging station systems, applying new techniques in charging station construction.

16

3. DEVELOPMENT OF ELECTRIC VEHICLES & CHARGING STATIONS IN CHINA

China also focuses on applying digitalization in the development of electric transportation, such as requiring the provision of charging station information to the general system and requiring an application to search for charging stations for vehicles. Chinese cities all prioritize the development of charging station infrastructure systems, especially in convenient locations, through which people find it easy to access and change their habits.

17

3. DEVELOPMENT OF ELECTRIC VEHICLES & CHARGING STATIONS IN CHINA

The government also has assessments and forms of reward for charging station investment projects. In addition to promoting the transition to using electric transportation, China has issued parallel policies restricting vehicles using internal combustion engines such as restricting circulation (1 day/week); Applying a lottery-like "drawing" mechanism to organizations and individuals wishing to buy new cars using internal combustion engines.

18

4. LESSONS LEARNED FOR VIETNAM FROM COUNTRIES AROUND THE WORLD

From the experience of countries that have developed charging stations for electric vehicles in the world, experts say:

- ✓ First of all, Vietnam needs to soon complete a complete set of standards for electric vehicle charging stations. The standard for plug types into the charging port will vary between regions and depends on the design of each vehicle model.
- ✓ Therefore, the development of a charging station system can meet the needs of all types of electric vehicles with different charging standards. This is also a big challenge that requires the efforts of the government and electric vehicle developers as well as charging station systems in Vietnam

19

4. LESSONS LEARNED FOR VIETNAM FROM COUNTRIES AROUND THE WORLD

From the experience of countries that have developed charging stations for electric vehicles in the world, experts say:

- ✓ In addition, the Government needs to issue preferential policies, encourage and support businesses, electric vehicle manufacturing companies, charging station suppliers and consumers. In addition, service providers need to prioritize charging infrastructure on routes with high traffic density. In particular, it is necessary to promote investment in power grid infrastructure to meet the requirements of building many charging stations.

20

IMPLEMENTATION ORGANIZATION

Bao Loc Technology Joint Stock Company (BLT.cert)

SMEDEC 2 Small and Medium Enterprise Development Support Center

21

22

Slides presented during the workshop: Process and Methods of Developing National Standards

1

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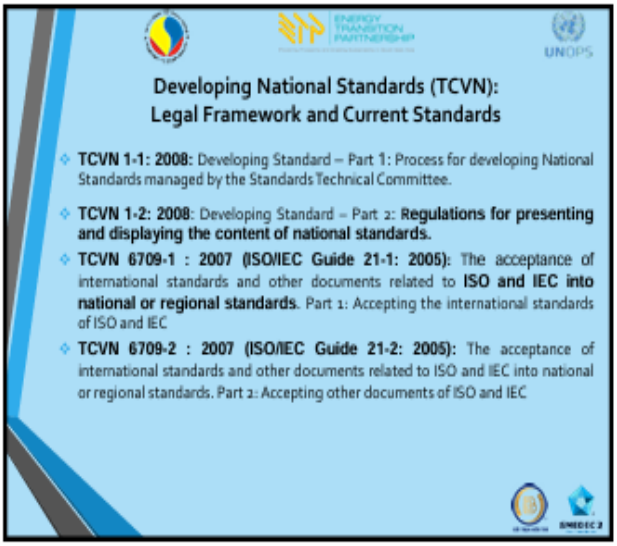

Developing National Standards (TCVN):
Legal Framework and Current Standards
TCVN 1-1: 2008: Developing Standard – Part 1: Process for developing National Standards managed by the Standards Technical Committee.
TCVN 1-2: 2008: Developing Standard – Part 2: Regulations for presenting and displaying the content of national standards.
TCVN 6709-1 : 2007 (ISO/IEC Guide 21-1: 2005): The acceptance of international standards and other documents related to ISO and IEC into national or regional standards. Part 1: Accepting the international standards of ISO and IEC
TCVN 6709-2 : 2007 (ISO/IEC Guide 21-2: 2005): The acceptance of international standards and other documents related to ISO and IEC into national or regional standards. Part 2: Accepting other documents of ISO and IEC

5


BASIC PRINCIPLES (1)
• Prioritizes improving the quality and efficiency of socio-economic endeavors, aiming to elevate the competitiveness of products, goods, and services in both domestic and international markets.
• Ensures compliance with safety standards to safeguard national security, hygiene, and human health. It also protects the legitimate rights and interests of relevant parties and promotes the preservation of animals, plants, and the environment while advocating for the prudent utilization of natural resources.

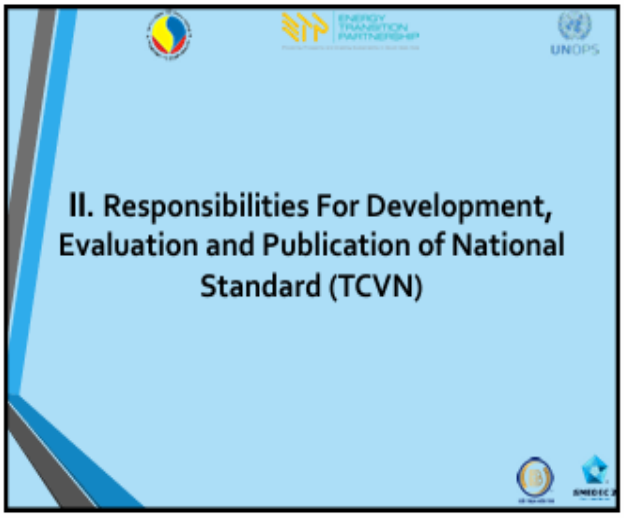
6


BASIC PRINCIPLES (2)
• Promoting Openness and Transparency: Ensures that the processes are open, transparent, and non-discriminatory, aiming to avoid unnecessary obstacles to production, business, and commercial activities;
• Inclusive Participation and Consensus: Involving relevant stakeholders and seeking consensus among all parties to ensure broad acceptance and effectiveness.
• Bases on scientific and technological advancements, practical experiences, current needs, and socio-economic development trends.
• Utilizing International, Regional, and State Standards as the foundation for developing Vietnamese standards and technical regulations, except when they are unsuitable for local geographical, climatic characteristics, techniques, technologies, or national interests.
• Prioritizing the regulations concerning product and goods usage features while limiting descriptive or detailed design requirements
• Maintaining consistency within Vietnamese standards systems and technical regulation systems

7


FOUNDATIONS FOR
STANDARD DEVELOPMENT
• International Standards, Regional Standards, foreign standards
• Scientific and Technological Research, Technological Advancement
• Practical Experiences
• Results of evaluation, assay, testing, checking and inspection.

8


II. Responsibilities For Development, Evaluation and Publication of National Standard (TCVN)

9


Responsibilities For Development, Evaluation and Publication of National Standard (TCVN)
Ministers, Heads of ministerial-level agencies, or Heads of Government agencies initiate the development of draft Vietnamese standards (TCVN) and request their appraisal and publication
The Minister of Science and Technology oversees the appraisal process for the draft of National Standard (TCVN) and publishes the approved National Standard (TCVN) upon the completion of appraisal

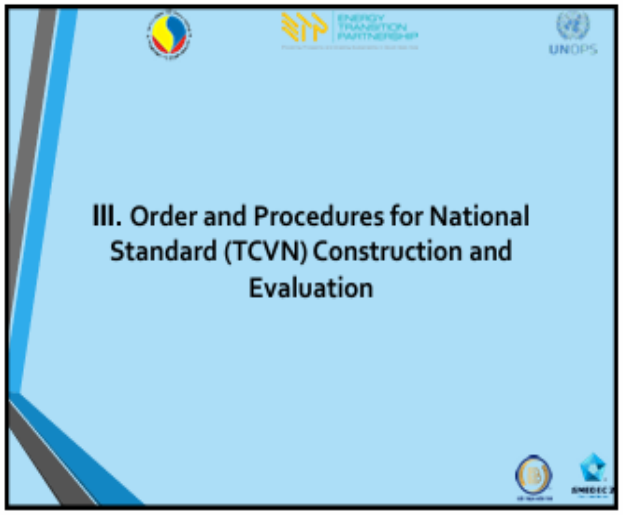
10


Rights of Organizations and Individuals Participating in National Standards (TCVN) Development
Suggesting and commenting on the planning and construction plans of TCVN
Presiding over or participating in the compilation of draft TCVN standards to request the Ministry of Science and Technology (MOST) to organize the appraisal and publication of the drafted standards.
Providing Feedback on the draft TCVN standards.

11


National Technical Standards Committee
Technical consulting organization established by the MOST specifically Directorate for Standards, Metrology and Quality (STAMEQ).
Members of the Technical TCVN standard committee comprise representatives from state agencies, science and technology organizations, associations, businesses, other relevant organizations, consumers, and experts.
Tasks of the Technical Committee: compiling the draft TCVN standards, providing comments on the draft TCVN standards and participating in the appraisal of the draft TCVN standards...

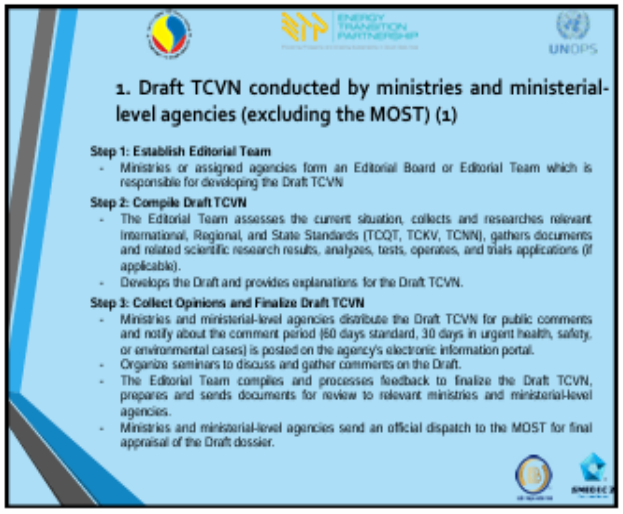
12


III. Order and Procedures for National Standard (TCVN) Construction and Evaluation

13


Order and Procedures for National Standard (TCVN) Construction and Evaluation
The draft is organized and developed by ministries and ministerial-level agencies (excluding the MOST)
Organizations and individuals propose drafts.
The draft is organized and developed by the MOST.

14


1. Draft TCVN conducted by ministries and ministerial-level agencies (excluding the MOST) (1)
Step 1: Establish Editorial Team
Ministries or assigned agencies form an Editorial Board or Editorial Team which is responsible for developing the Draft TCVN
Step 2: Compile Draft TCVN
The Editorial Team assesses the current situation, collects and researches relevant International, Regional, and State Standards (TCQT, TCKV, TCNN), gathers documents and related scientific research results, analyzes, tests, operates, and trials applications (if applicable).
Develops the Draft and provides explanations for the Draft TCVN.
Step 3: Collect Opinions and Finalize Draft TCVN
Ministries and ministerial-level agencies distribute the Draft TCVN for public comments and notify about the comment period (60 days standard, 30 days in urgent health, safety, or environmental cases) is posted on the agency's electronic information portal.
Organize seminars to discuss and gather comments on the Draft.
The Editorial Team compiles and processes feedback to finalize the Draft TCVN, prepares and sends documents for review to relevant ministries and ministerial-level agencies.
Ministries and ministerial-level agencies send an official dispatch to the MOST for final appraisal of the Draft dossier.

15


1. Draft TCVN conducted by ministries and ministerial-level agencies (excluding the MOST) (2)
Step 4: Appraise Draft TCVN
STAMEQ reviews the Draft TCVN dossier.
STAMEQ requests additional information from the responsible ministries or agencies if the dossier does not meet requirements.
STAMEQ establishes an appraisal council based on proposals from the Vietnam Standards and Quality Institute and relevant regulations.
The responsible ministries or agencies process feedback, complete the Draft TCVN and related documents, and submit to the MOST (through STAMEQ) within 120 days.
If the deadline is missed, the Draft TCVN must be re-evaluated.
Step 5: Announce TCVN
STAMEQ reviews the results of the appraisal and prepares the Draft TCVN dossier for approval.
If the dossier meets requirements, STAMEQ submits to the MOST for consideration and announcement.
If the dossier does not meet requirements, the responsible ministries or agencies must revise and complete the Draft TCVN dossier.

16


2. Draft Proposed by Organizations and Individuals (1)
Organizations and individuals submit written requests along with the Draft TCVN dossier to the MOST (STAMEQ).
STAMEQ review and assign to the corresponding TCVN Technical Committee.
Step 1: Build Draft TCVN (implemented by TCVN Technical Committee)
Establish a group to compile a draft of TCVN based on drafts proposed by organizations and individuals.
Organize comments and discussions on the draft in the TCVN Technical Committee.
Complete and provide explanations for the draft TCVN.
Prepare documents for the draft TCVN, submit to STAMEQ for review and decide to send the draft TCVN for comments.

17


2. Draft Proposed by Organizations and Individuals (1)
Step 2: Collect Opinions and Complete the Draft TCVN
Technical Committee sends the draft TCVN for comments.
Notify the comment collection period on STAMEQ's electronic information portal. The commenting period is typically 60 days; in urgent cases related to health, safety, and environment, it can be shortened to no less than 30 days.
Organize a seminar to discuss and comment on the draft TCVN.
Process and complete the draft TCVN and prepare documents for the draft TCVN according to regulations.
Submit to STAMEQ for organizing the appraisal of the TCVN.

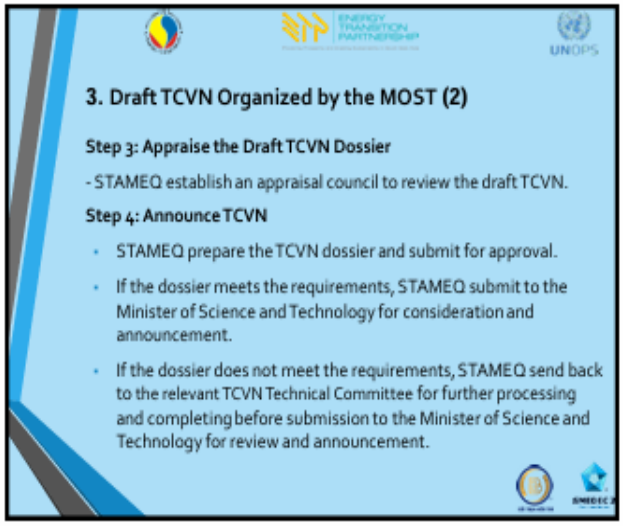
18


2. Draft Proposed by Organizations and Individuals (2)
Step 3: Appraise the Draft TCVN Dossier
- STAMEQ establishes an appraisal council.
- The council prepares an appraisal record with specific conclusions and recommendations.
- The TCVN Technical Committee processes the appraisal opinions and submits the revised draft to STAMEQ for consideration.
Step 4: Announce TCVN
STAMEQ prepares the final draft documents for approval.
If the draft meets the appraisal requirements, STAMEQ submit to the Minister of Science and Technology for consideration and announcement.
If the draft does not meet the requirements, STAMEQ return to the relevant TCVN Technical Committee for further revision and completion before resubmission.

19


3. Draft TCVN Organized by the MOST(1)
STAMEQ assigns the relevant TCVN Technical Committee to develop the Draft TCVN
Step 1: Develop a draft of TCVN (implemented by TCVN Technical Committee)
The TCVN Technical Committee forms a group to compile the draft.
Conduct research on TCQT, TCKV, TCNN, financial resources, documents, and related scientific research results.
Assesses the current situation and performs sample analysis, testing, and evaluation (if applicable) to determine the criteria and technical requirements for the draft TCVN.
Organize discussions and collects comments within the Technical Committee.
Step 2: Collect opinions and complete the draft TCVN
Send the draft TCVN for public comments, announce the consultation period on STAMEQ's electronic information portal (60 days standard, 30 days for urgent health, safety, or environmental cases).
- Organize seminars to discuss and gather feedback on the draft.
- Synthesize and process the comments to finalize the draft TCVN, prepare the required documents for the draft TCVN and submit to STAMEQ for appraisal.

20


3. Draft TCVN Organized by the MOST (2)
Step 3: Appraise the Draft TCVN Dossier
- STAMEQ establish an appraisal council to review the draft TCVN.
Step 4: Announce TCVN
STAMEQ prepare the TCVN dossier and submit for approval.
If the dossier meets the requirements, STAMEQ submit to the Minister of Science and Technology for consideration and announcement.
If the dossier does not meet the requirements, STAMEQ send back to the relevant TCVN Technical Committee for further processing and completing before submission to the Minister of Science and Technology for review and announcement.

21


Contents of Appraisal of Draft TCVN
Compatibility with Scientific and Technological Progress, the relevance to the conditions and needs of socio-economic development.
Conformity with technical regulations and legal requirements, relevant international commitments, the requirements for harmonization with international standards (TC).
Consistency and Synchronization within the overall TCVN system, adherence to the principle of consensus and balance of interests among relevant parties.
Compliance with Professional Requirements, the order and procedures for developing TCVN

22


IV. Method in Developing National Standard (TCVN)

23


Method in Developing TCVN
New construction
Accept International Standards
Completely Equivalent
Equivalent with Additions and Modifications
Non Equivalent
Modifications and Additions
Replace

24


Accept "Completely Equivalent"
Completely Equivalent in technical content, structure, and vocabulary (or a completely equivalent translation); or
Completely Equivalent in technical content and structure even though it might include minimal editorial changes such as:
changing decimal commas to decimal points;
correcting misprints or changing page numbering;
removing text in one or more languages (for multilingual international standards);
including technical amendments or corrections.

25


Accept "Completely Equivalent"
changing the standard name to align with the current national standards set.
replacing "This International Standard" with "This National Standard" or "This Standard."
including references that do not alter, add, or delete provisions of the international standard.
following the "reversibility principle"

26


Accept "Equivalent with Modifications" (1)
Technical Differences: Permitted if they're clearly identified and explained.
Have structure similar to ISO and IEC international standards.
Structural Changes: Allowed only if the structure and content of both standards can be easily compared
Principles:
A National Standard should primarily adopt an International Standard. It is possible to incorporate multiple International Standards into a national standard. Easy comparison of content between standards within a category is needed to identify and explain variations.
Modified equivalent standards may contain permissible variations of fully equivalent standards.
The "reversibility principle" is not followed.

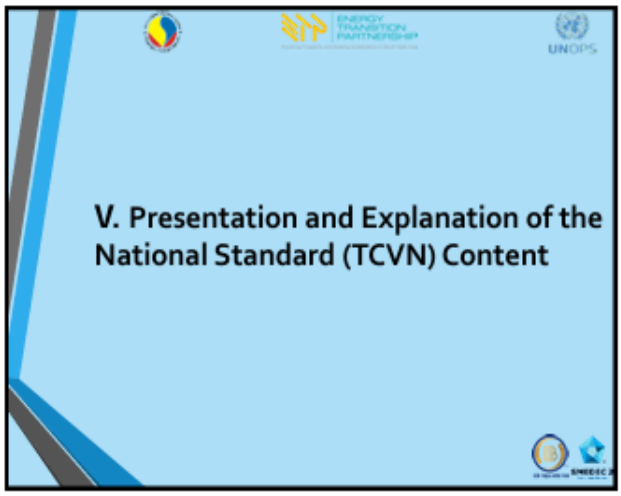
27


Accept "Equivalent with Modifications" (2)
Cases of Equivalent Standards with Modifications:
National standards have less content than the international standard.
National standards include additional content beyond the international standard.
National standards modify certain parts of the ISO and IEC standards.
National standards specify one option where the international standard offers multiple.

28


Non Equivalent
Not equivalent to ISO and IEC International Standards in technical content and structure, with changes not clearly identified, or
Only a few or few important provisions of ISO and IEC International Standards are retained in national standards.
"Non Equivalent" standards are not considered acceptable to international standards.

29


V. Presentation and Explanation of the National Standard (TCVN) Content

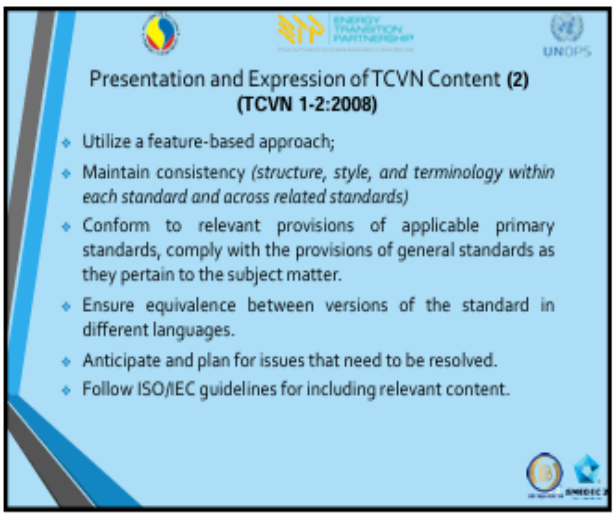
30


Presentation and Expression of TCVN Content (1)
A standard must be prepared for a subject to be standardized and published as a complete document.
The standard can be divided into separate parts with the same standard number. Each part can be replaced or modified separately when necessary. This approach is used in the following cases:
- The standard has very large content and covers many aspects.
- Parts of the standard are linked together.
- Parts of the standard can be cited independently in regulatory documents, or
- Used for certification purposes.

31


Presentation and Expression of TCVN Content (2)
(TCVN 1-2:2008)
Must be complete to the extent necessary within the limits of the scope of application.
Must be consistent, clear, and accurate (avoiding confusion or misunderstanding)
Should reflect the current state of technical development (based on scientific and technological advances, practical experience, and actual conditions)
Should provide direction for future technology development.
Be understandable by individuals with relevant qualifications, even if they don't involve in the drafting process

32


Presentation and Expression of TCVN Content (2)
(TCVN 1-2:2008)
Utilize a feature-based approach;
Maintain consistency (structure, style, and terminology within each standard and across related standards)
Conform to relevant provisions of applicable primary standards, comply with the provisions of general standards as they pertain to the subject matter.
Ensure equivalence between versions of the standard in different languages.
Anticipate and plan for issues that need to be resolved.
Follow ISO/IEC guidelines for including relevant content.

33


VI. Application of National Standard (TCVN)

34


Principles of Applying TCVN
Standards are applied in the voluntary basis
All or part of a specific standard becomes mandatory when cited in legal documents, technical regulations, or other regulatory frameworks (QCKT)

35


Method of Applying TCVN
Standards are applied directly or referenced in other documents for various purposes
TCVN serves as the basis for various assessment activities including ĐGSPH : Testing, Calibration, Appraisal, Standard conformity certification, Announcement of standard conformity, Accreditation for: Laboratories, Product Handling Centers (PHC), Technical Certification Centers (TCCN), Management Systems Certification Bodies (TCCGD)

36

List of participants in the workshop

ENERGY TRANSITION PARTNERSHIP

UNOPS

DANH SÁCH THAM GIA HỌP THAM VẤN

Hoạt động Hỗ trợ kỹ thuật "Xây dựng bộ tiêu chuẩn quốc gia (TCVN) về Hạ tầng trạm sạc xe điện tại Việt Nam"

Introduction program for implementing technical support activities "Developing 08 National Standards for Electric Vehicle Charging Infrastructure in VietNam"

STT	Full name/Họ và tên	Gender/ Giới tính	Phone/Điện thoại	Organization/ Đơn vị công tác	Ký tên
1.	Trần Kim Thoa	Nữ	0906143256	Cty Tư vấn Procert	
2.	Trần T. Minh Thắng	Nữ	0946706992	Cty TV Procert HP	
3.	Ng Ngọc Tân	Nam	0944533545	Cục Cyber Security	
4	Ng Phải Học	Nam	0902499984	Cty SET	
5	Ngô Văn Bắc	Nam	0938173317	Cty Lipaco	
6.	Ng Lâm Hoàng	Nam	0912227117	Quacert	
7.	Trần Tiến Đạt	Nam	0966904865	Báo Lao động	
8.	Phan Đào Anh Tú	Nam	0846067918	Viện KHCN GTVT	
9 -	Cao Văn Hưởng	Nam	0912295118	Tổng cục TCĐLCL	
10	Bùi Ngọc Bích	Nữ	0904529364	Viện TCL VN	
11	Đặng Thúy Linh	Nữ	0966366610	Viện TCL VN	
12	Trần Thị Hồng	Nữ	0982729993	Vụ KHCN&MT	
13.	Ng Thị Thanh Xuân	Nữ	0977495518	Viện TCL VN	
14	Đặng Thanh Huyền	Nữ	0912951978	Viện TCL VN	
15	Ngô Đức Duy	Nam	0944029696	Quacert	
16	Đinh Nhật Minh	Nam	0912845617	VSRI	
17.	Phan Văn Thiện	Nam	0834165168	ĐH GTVT	
18	Ng Tuấn Anh	Nam	0913225972	ĐH Phenikaa	
19	Ng Tiến Dũng	Nam	0936757881	ĐHSP KT Hưng	
20	Lê Thị Kim Thanh	Nữ	0912935834	VCCI	
22.	Nghiêm Thanh Hải	Nam	0943140393	Viện KHCN&MT	
24	Đặng Quốc Anh	Nam	0912468267	Viện KHCN GTVT	
25	Ng Hồng Ngọc	Nữ	0989621204	Cty SET	
26	Phùng Mạnh Chí	Nam		Bộ KHCN	
27	Lê Đức Dũng	Nam	0983490810	Viện KHCN GTVT	

SMEDEC 2

DANH SÁCH THAM GIA HỌP THAM VẤN

Hoạt động Hỗ trợ kỹ thuật "Xây dựng bộ tiêu chuẩn quốc gia (TCVN) về Hạ tầng trạm sạc xe điện tại Việt Nam"

Introduction program for implementing technical support activities "Developing 08 National Standards for Electric Vehicle Charging Infrastructure in VietNam"

STT	Full name/Họ và tên	Gender/ Giới tính	Phone/Điện thoại	Organization/ Đơn vị công tác	Ký tên
28	Ng Thu Hao	Nữ	0967511008	VP	
29	Ng Thị Huyền Tray	Nữ	0889985485	VP	
30	Ng Hùng Hang	Nữ	0985991798	Báo TN MT	
31.	Bùi Thị Hoàng Yến	Nữ	0978 646489	CTy LK	
32.	Lê Hoàng Anh	Nam	0915848985	Vụ Pc luật	
33	Vũ Thu Huế	Nữ	0912169168	Cty Hà Thắng	
34	Trịnh Tùng Tiếp	Nam	0936416898	VNP	
35	Ng Phg Thuỷ	Nữ	0814233989	VCCI	

Contract for the Event

CỘNG HOÀ XÃ HỘI CHỦ NGHĨA VIỆT NAM

Độc lập - Tự do - Hạnh phúc

HỢP ĐỒNG DỊCH VỤ Service contract

Số: 1209/2024/HĐDV

- Căn cứ Bộ Luật Dân sự số 91/2015/QH13 đã được Quốc hội nước Cộng hoà Xã hội chủ nghĩa Việt Nam thông qua ngày 24/11/2015, có hiệu lực từ ngày 01/01/2017;

- Căn cứ Luật thương mại, Nghị định số 81/2018/NĐ-CP ngày 22 tháng 5 năm 2018 của Chính phủ quy định chi tiết Luật thương mại về hoạt động xúc tiến thương mại;

- Căn cứ Luật Quảng cáo số 16/2012/QH13 đã được Quốc hội nước Cộng hoà xã hội chủ nghĩa Việt Nam thông qua ngày 21/06/2012, có hiệu lực từ ngày 01/01/2013;

Căn cứ vào nhu cầu và khả năng của mỗi bên.

Hôm nay ngày 06 tháng 05 năm 2024, chúng tôi gồm:

Bên thuê (gọi tắt là bên A): Client (Party A) Bao Loc Technology Joint Stock Company - BLT.cert

Tên đơn vị: CÔNG TY CỔ PHẦN CÔNG NGHỆ BẢO LỘC

Địa chỉ: Số 09-BT5, Khu đô thị Văn Phú, Phường Phú La, Quận Hà Đông, Thành phố Hà Nội, Việt Nam

Mã số thuế: 0109811567

Số Tài khoản: 1280996224 tại Ngân hàng TMCP Đầu tư và Phát triển Việt Nam (BIDV) Chi nhánh Tràng Tiền

Người đại diện: Bà Đặng Ngọc Hiên

Chức vụ: Giám đốc

Bên nhận thuê (Gọi tắt là bên B): Service provider (Party B)

Tên đơn vị: CÔNG TY TNHH TƯ VẤN ĐẦU TƯ VÀ DU LỊCH QUỐC TẾ THIÊN HÀ Thien Ha International Tourism and Investment Consulting Company Limited

Đại diện: Bà Ngô Thúy Quỳnh

Chức vụ: Giám đốc

Địa chỉ: 53 Thái Thịnh - Thịnh Quang - Đống Đa, Hà Nội, Hà Nội

Điện thoại: 024. 3732 4124

Tên Tài khoản: Công ty TNHH tư vấn đầu tư và du lịch quốc tế Thiên Hà

Số TK: 35353219

Tại: Ngân hàng TMCP Á Châu, Chi nhánh Đông Đô – Hà Nội

Mã số thuế: 0102466784

Hai bên cùng nhau nhất trí ký kết hợp đồng với các nội dung sau:

Điều 1: Nội dung của hợp đồng Article 1: Scope of work

Bên B đồng ý cung cấp cho Bên A dịch vụ tổ chức hội thảo chi tiết như sau :

1. Thời gian và địa điểm: Location: Movenpick Hotel 83 Ly Thuong Kiet, Hai Ba Trung, Hanoi

- Địa điểm: Khách sạn Movenpick 83 Lý Thường Kiệt, Hai Bà Trưng, Hà Nội

- Thời: Ngày 15/5/2024 Time: May 15, 2024

Stt	Danh mục	Đvt	Số lượng	Số ngày/lần	Đơn giá	Thành tiền
1	Họp cả ngày bao gồm ăn trưa và 1 trà bánh hoa quả giữa giờ (All day meeting includes lunch and 1 fruit tea and cake in between)	khách	50	1	1,350,000	67,500,000
2	Màn hình Led 1/2 ngày (1/2 day LED screen)	m2	36	1	1,100,000	39,600,000
3	Chuột slide song song 2 màn hình (Mouse slides parallel to 2 screens)	chiếc	1	1	1,000,000	1,000,000
4	Thiết kế bộ POSM Hội thảo (Banner, poster, cover, avatar, frame, thẻ đeo khách mời, backdrop, photoshoot, slide) (Design the Conference POSM set (Banner, poster, cover, avatar, frame, guest badge, backdrop, photoshoot,	bộ	1	1	20,000,000	20,000,000
5	Thiết kế thư mời (Design invitation letters)	Chiếc	1	1	2,000,000	2,000,000
6	Standee (thiết kế, in ấn và dựng khung) (Standee (design, printing and framing)	chiếc	2	1	1,000,000	2,000,000
7	Dịch Carbin 1/2 ngày (Carbin translation 1/2 day)	chiếc	1	1	12,000,000	12,000,000
8	Tai nghe 1/2 ngày (Headphones 1/2 day)	chiếc	50	1	125,000	6,250,000
9	Màn hình tivi (TV screen)	chiếc	2	1	2,000,000	4,000,000
10	Micro cài áo (Lapel microphone)	chiếc	1	1	600,000	600,000
11	Flipchart	chiếc	2	1	500,000	1,000,000
12	Laptop trình chiếu (Presentation laptop)	chiếc	2	1	1,000,000	2,000,000
13	Âm thanh (Sound)	gói	1	1	4,000,000	4,000,000
14	Media/Nhiếp ảnh/Quay phim (Media/Photography/Videography)	gói	1	1	10,000,000	10,000,000

*** Note:** We anticipated 50 attendees for the workshop, but due to unforeseen circumstances, only 35 were able to attend in person while 15 participated online. However, since arrangements with the event organizers were confirmed three days prior, the number of meals and fruit servings could not be altered.

15	Đường truyền internet Internet connection	đường	1	1	6,000,000	6,000,000
16	Nhóm hỗ trợ kỹ thuật và logistics Technical and logistics support team	gói	1	1	4,000,000	4,000,000
17	Thiết bị trực tuyến gồm camera 360 độ, camera fullhd, bộ trộn hình ảnh, bộ trộn âm thanh, máy tính trực host, kỹ thuật phục vụ Online equipment includes 360-degree camera, full HD camera, image mixer, sound mixer, host computer, ser	gói	1	1	30,000,000	30,000,000
18	Phòng ở Accommodations	phòng	8	1	1,200,000	9,600,000
19	Vé máy bay Hồ Chí Minh - Hà Nội - Hồ Chí Minh và di chuyển Air tickets Ho Chi Minh - Hanoi - Ho Chi Minh and transportation	vé	8	1	6,800,000	54,400,000
20	Photo tài liệu Photo document	bộ	50	1	250,000	12,500,000
	TỔNG					**288,450,000**

The total value of the contract — The above price includes VAT

2. Tổng giá trị hợp đồng: **288,4500,000 VNĐ** (Giá trên đã bao gồm thuế GTGT)

Bằng chữ: Hai trăm tám mươi tám triệu, bốn trăm năm mươi nghìn đồng./.

Điều 2: Hình thức và thời hạn thanh toán Article 2: Payment form and term

1. Hình thức thanh toán: Chuyển khoản

2. Thời hạn thanh toán:

- Bên A thanh toán cho bên B toàn bộ giá trị hợp đồng và giá trị phát sinh nếu có sau khi dịch vụ kết thúc và bên A nhận được đầy đủ hóa đơn và các chứng từ thanh toán hợp lệ.

Điều 3: Trách nhiệm của mỗi bên Article 3: Responsibilities of each party

1. Trách nhiệm của Bên A:

- Thực hiện đúng theo các nội dung đã xác nhận, thanh toán toàn bộ chi phí đúng thời hạn theo đúng các điều khoản đã cam kết trong hợp đồng.

- Thông báo cho Bên B địa điểm họp; đảm bảo nguồn điện ổn định và có phương án trong trường hợp bị mất điện.

- Trong trường hợp Bên A gây đổ vỡ hoặc thiệt hại vật dụng của Bên B, Bên A phải chịu hoàn toàn trách nhiệm bồi thường chi phí tổn thất thực tế cho Bên B.

2. Trách nhiệm của Bên B:

- Thực hiện đầy đủ các điều khoản như đã nêu trong Điều 2 của Hợp đồng và tuân theo các quy định của pháp luật hiện hành có liên quan.

- Thực hiện theo dõi quá trình hội nghị, đảm bảo chất lượng đường truyền, âm thanh.

Điều 4: Điều khoản chung Article 4: GENERAL TERMS

1. Mọi tranh chấp phát sinh trong quá trình thực hiện hợp đồng sẽ được giải quyết trên cơ sở thương lượng và giải quyết dựa trên tinh thần hợp tác hữu nghị, tôn trọng lẫn nhau và đảm bảo uy tín của hai bên.

2. Hai bên cam kết thực hiện đúng các điều khoản đã ghi trong Hợp đồng này.

3. Hợp đồng sẽ tự động thanh lý nếu không có phát sinh trong quá trình thực hiện.

Hợp đồng có hiệu lực kể từ ngày ký và hợp đồng được lập thành 02 bản có giá trị pháp lý như nhau, bên A giữ 01 bản, bên B giữ 01 bản.

ĐẠI DIỆN BÊN A

CÔNG TY CỔ PHẦN CÔNG NGHỆ BẢO LỘC
M.S.D.N. 0109811567

GIÁM ĐỐC

Đặng Ngọc Hiên

ĐẠI DIỆN BÊN B

M.S.D.N: 0102[illegible] C.T.T.N.H.H
CÔNG TY TRÁCH NHIỆM HỮU HẠN TƯ VẤN ĐẦU TƯ VÀ DU LỊCH QUỐC TẾ THIÊN HÀ
THÀNH PHỐ HÀ NỘI

GIÁM ĐỐC

Ngô Thúy Quỳnh

Annex 4: Meeting minutes on the Consultation with STAMEQ Regarding the Adjustment of Standards

I. Time: 13:30, April 23, 2024

II. Participants:

1. Mr. Nguyen Van Khoi, Head of the Standards Department
2. Mr. Trieu Viet Phuong, Director of the Institute of Standards, Metrology and Quality
3. Mrs. Doan Thi Thanh Van, Head of Department 4, Institute of Standards, Metrology and Quality.
4. Mr. Phung Quang Minh, Planning Department, Institute of Standards, Metrology and Quality.
5. Mrs. Nguyen Thi Thuy Linh, Officer, Planning Department, Standards Department
6. Mrs. Dang Ngoc Hien, Project Director.
7. Mr. Hoang Quoc Vuong, Deputy Head of BLT.Cert.

III. Agenda: Expert council consultation on adjusting from 09 to 08 TCVN standards

1. Mrs. Dang Ngoc Hien, on behalf of the Project Implementation Team, presents a summary of the project "Development of National Standards (TCVN) for 09 National Standards on electric vehicle charging infrastructure in Vietnam," based on:

- The Law on Standards and Technical Regulations of June 29, 2006, and its amendments related to planning from November 20, 2018;
- Detailed regulations on the development and application of standards in Circular No. 11/2021/TT-BKHCN of November 18, 2021;
- The agreement No. ETP/VIE/EEIW-6/2023 dated May 20, 2023, between the United Nations Office for Project Services (UNOPS) and Bao Loc Technology Joint Stock Company (BLT.cert) for the development of 09 national standards important for electric vehicle charging infrastructure.

The project is carried out based on the cooperation minutes signed between UNOPS and the Directorate for Standards, Metrology, and Quality (STAMEQ) to

support STAMEQ in developing a set of national standards in Vietnam for electric vehicle charging infrastructure.

Bao Loc Technology Joint Stock Company (BLT.cert) began the implementation of the project: "Development of 09 important national standards for electric vehicle charging infrastructure in Vietnam," supported by UNOPS to help the Vietnamese government meet its commitment to achieve net-zero emissions by 2050. This project also progressively builds and completes the national standard system of Vietnam for electric vehicle charging infrastructure.

2. Mr. Nguyen Hong Minh, Planning Department, Institute of Standards, Metrology, and Quality:
   - After reviewing the 09 TCVN developed by the Project Team, 08 ISO standards have been officially issued, while one standard, ISO 15118-21, has not yet been officially issued.
   - It is recommended that the council remove the ISO 15118-21 standard from the project to be implemented once the standard is officially issued.
3. Mr. Khoi, Head of the Standards Department, concludes:
   - Agrees to adjust from 09 TCVN to 08 TCVN and includes it in the 2024 work program of the Ministry of Science and Technology (MOST).
   - Proposes that the one TCVN be implemented after the standard is officially issued.

The consultation meeting concluded at 15:30 the same day.

Annex 5: Meeting minutes on the Consultation with the Expert Council on the in-depth evaluation of the test results for the Electric Vehicle Charging Station

I. Time: 18th April, 2024

II. Participants:

1. Mr. Tran Quy Giau, Head of the Measurement Department
2. Mr. Nguyen Anh Son, Vice-Director of the Institute of Measurement

3. Mr. Ly Tien Dung, Electrical Measurement Laboratory, Quality Assurance and Testing Center 1 (Quatest 1).
4. Mrs. Dang Ngoc Hien, Project Director.
5. Mr. Hoang Quoc Vuong, Deputy Head of BLT.Cert
6. Nguyen Cam Long, Expert from BLT.Cert
7. Pham Xuan Hien, Expert from BLT.Cert
8. Le Thi Hoang Anh, Expert from SMEDEC 2
9. Nguyen Thi Thu Ha, Expert from SMEDEC 2

III. Content: Consultation with the Expert Council on the in-depth evaluation of the test results for the Electric Vehicle Charging Station

1. Mr. Hoang Quoc Vuong, Deputy Head of BLT.Cert, presents the proposal content:

Based on the Agreement Contract No. ETP/VIE/EEIW-6/2023 signed on May 20, 2023, between the United Nations Office for Project Services (UNOPS) and Bao Loc Technology Joint Stock Company (BLT.cert) regarding the "Research and Development of 08 National Standards (TCVN) on Electric Vehicle Charging Infrastructure" in Vietnam (hereafter referred to as the "UNOPS Project").

Within the research framework of the project, 08 Standards are expected to be developed and issued. Throughout the project implementation period, during the research and actual surveys (domestic and international), we assessed the technical aspects and infrastructure conditions in Vietnam related to the development of charging station projects and testing capabilities for these standards, which are very weak or almost nonexistent.

In the Vietnamese market, VinFast is a leading manufacturer of electric cars and motorcycles and is currently expanding internationally. Being a pioneer in all fields that Vingroup develops, we are aware that your company has invested significantly in electric vehicle technology, charging stations, and capabilities in constructing, testing,

and operating charging stations for electric vehicles. As the implementing unit of the UNPOS project supporting the Vietnamese government in developing a set of standards for charging stations, we hope and propose your company's support in exchanging information and sharing data about your testing capabilities for charging stations.

We understand, according to the regulations and confidentiality principles of VinFast Group, that the test results will not be disclosed outside the scope of the VinFast Group, and the project must respect the regulations of the VinFast Group. Based on the principle of receiving support and cooperation from the VinFast Group, we respectfully comply with the regulations set by the VinFast Group and sincerely thank the group for its support.

Therefore, we will report to ETP-UNOPS that we propose to replace the test results with a comprehensive analysis report during the inspection of the charging stations in Vietnam, to comply with VinFast's data security regulations.

The project's team of experts is experienced in standards to research and develop a set of standards for electric vehicle charging pillars. However, as this is a relatively new field in Vietnam, during the research process, our team of experts encountered many difficulties that needed support. We highly hope your company can provide experts with in-depth experience in analyzing and evaluating in-depth reports on the compatibility between charging stations and electric vehicles so we can complete and issue a set of standards for charging pillars, in line with the current situation and sustainable development direction of the Vietnamese government. To make the meeting effective, one issue we are very interested in is the testing capabilities of Vietnam in general and of VinFast in particular in this field, especially the testing of DC fast charging stations for cars with capacities of 30kW and 60kW / Superfast DC charging pillars for cars with a capacity of 150kW.

To provide your company with a better understanding of the standards our project is developing, we would like to share information about the 08 Standards as follows:

1. National Standard TCVN 15118-1 Road vehicles - Vehicle to grid communication interface - Part 1: General information and use-case definition

2. National Standard TCVN 15118-2 Road vehicles — Vehicle-to-Grid Communication Interface - Part 2: Network and application protocol requirements

3. National Standard TCVN 15118-3 Road vehicles - Vehicle to grid communication interface - Part 3: Physical and data link layer requirements

4. National Standard TCVN 15118- 4 Road vehicles - Vehicle to grid communication interface - Part 4: Network and application protocol conformance test

5. National Standard TCVN 15118-5 Road vehicles - Vehicle to grid communication interface - Part 5: Physical layer and data link layer conformance test

6. National Standard TCVN 15118- 8 Road vehicles - Vehicle to grid communication interface - Part 8: Physical layer and data link layer requirements for wireless communication

7. National Standard TCVN 15118-9 Road vehicles - Vehicle to grid communication interface - Part 9: Physical and data link layer conformance test for wireless communication

8. National Standard TCVN 15118- 20 Road vehicles — Vehicle to grid communication interface — Part 20: 2nd generation network layer and application layer requirements.

2. Mr. Nguyen Anh Son, Vice-Director of the Institute of Measurement, expresses his opinion:

Verification plays a crucial role in ensuring the reliability and accuracy of equipment used across various industries. By evaluating and confirming the measurement characteristics of equipment against technical requirements, verification ensures that instruments perform as expected. This process includes initial verification before equipment is put into use, periodic checks to maintain consistent performance, and necessary verifications after any repairs. These steps are essential for upholding standards, ensuring safety, and maintaining quality in processes where precise measurements are critical for successful outcomes.

3. Mr. Huynh Khanh Vinh Khuong, representative of VinFast Group, expresses his opinion:

Agrees to support the Project Team in conducting in-depth research of the test report for the electric vehicle charging station;

VinFast Group will assign an experienced expert in this field to work together with the project team

The research report includes three main activities: testing, measurement, and calibration based on results and the process of working with VinFast Company.

4. Ms. Dang Ngoc Hien, a representative of the project implementation team, concludes the consultation seminar:

The project implementation team thanks the experts for their contributions and sharing;

Will manage and operate the project implementation team to carry out the contents as discussed in the consultation.

The consultation concludes at 5. pm the same day

Annex 6: Meeting minutes of the Survey and On-site Work at the VinFast LLC Factory in Hai Phong

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I. Time: May 2024

II. Location: Hai Phong

III. Attendees:

1. Mr. Tran Quy Giau, Head of the Measurement Department
2. Mr. Nguyen Anh Son, Vice-Director of the Institute of Measurement
3. Mr. Ly Tien Dung, Electrical Measurement Laboratory, Quality Assurance and Testing Center 1 (Quatest 1).
4. Mrs. Dang Ngoc Hien, Project Director.
5. Mr. Hoang Quoc Vuong, Deputy Head of BLT.Cert
6. Nguyen Cam Long, Expert from BLT.Cert
7. Pham Xuan Hien, Expert from BLT.Cert
8. Le Thi Hoang Anh, Expert from SMEDEC 2
9. Nguyen Thi Thu Ha, Expert from SMEDEC 2

III. Content: Report on work results and field survey at VinFast LCC factory in Hai Phong

1. Mr. Hoang Quoc Vuong, Deputy Head of BLT.Cert, presented the proposed content:
    - The Project Implementation Team reports on the outcomes of the field surveys conducted at the VinFast factory.
    - Following the field surveys in Hai Phong, the implementation team achieved the following results:

No	Identified gaps	Addressed issue	Result
1	Specifications and testing methods	1. Vocabulary 2. Unit parameters 3. Test and testing methods	Completed
2	Planning and Performance assessments	1. System environment 2. System sizing and selection 3. Functional system performance 4. Performance assessments 5. Design, Operation, and Maintenance	Completed
3	Environmental issues	1. Guidance on environmental issues 2. Standard on environmental issues 3. Greenhouse gas (GHG) emissions assessment	Completed
4	Safety considerations	1. Safety considerations 2. Safety requirements 4. Safety test methods and procedures 5. Fire protection	Completed

    - The details about the test results are in **Annex 1** of this Report
2. Mr. Ly Tien Dung, Electrical Measurement Laboratory, Quality Assurance and Testing Center 1 (Quatest 1), express his opinion:

    During our comprehensive field trip to the Vinfast factory, facilitated by the collaboration and expert guidance received over two working sessions, our research

team faced a pivotal discovery. Vinfast, a leader in electric vehicle manufacturing, currently lacks a prototype of a wireless charging station that aligns with the standards under development. Recognizing this gap, the team has taken a proactive approach by selecting an existing prototype of a portable AC 3.5KW charging station available at Vinfast for detailed study. This decision has led to the formulation of a structured testing plan tailored specifically to this model. This strategic pivot not only ensures the continuity of our research but also aligns with the practical realities faced in the field, maximizing the relevance and applicability of our findings.

3. Mrs. Dang Ngoc Hien, Project Director, conclude the meeting: The Project Implementation Team thanks the Directorate as well as VinFast Group for their active support that facilitated the project team to achieve the set objectives.

   The meeting concluded at: 4 p.m the same day.