INCEPTION REPORT

Training Specialist for the Needs Assessment and Development of Training Curricula on Low Carbon Urban Transport and Electric Vehicles

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12 September 2022

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Introduction

This inception report was prepared primarily to summarize the results of discussions of the project team with key stakeholders in this initiative. Through these discussions, more specific pathways for the project were identified, while other opportunities and issues in this overall endeavor are uncovered.

With approval of the UNDP management team and the stakeholders, the project team hopes to proceed with a clearer direction after this report.

It also aims to provide the study team a sound background of the current training capacity and capabilities of the Technical Education and Skills Development Authority (TESDA) specifically in the automotive sector, and to perform a quick benchmarking of TESDA's current competency standard on Pure Battery Propelled Electric Vehicle Servicing Level II with a few known similar training materials from other countries.

This inception report has the following objectives:

1. Summarize key meetings held in the first few months of the project with TESDA, Department of Energy (DOE), Electric Vehicle Association of the Philippines (EVAP), Clean Air Asia (CAA), Technological University of the Philippines (TUP) and Cavite State University (CavSU).
2. Identify and analyze the existing training programs of TESDA for the automotive sector.
3. Review and perform a quick benchmarking of TESDA's Competency Standard for Pure Battery Propelled Electric Vehicle Servicing Level II.
4. Propose a more specific direction of the project.

Afterwards, the immediate next steps, items for further clarification, and the revised workplan for this project will be presented.

Insights from discussions with key stakeholders

Commented [1]: Kindly consider summarizing the key ideas in bullet points with brief discussion.

Commented [2R1]: Thank you for the comment. This document is actually accompanied by a 3 to 7-page minutes for each meeting. I think what we have here now in the report is already a good summary of these meetings and shortening it further would rather omit important details from the meetings. Nonetheless, let me add a few bullet points below for the key ideas I got from the meetings.

In preparation for this report, the project team held various meetings with key stakeholders. These were as follows:

- Meeting with EVAP President Edmund Araga on July 25, 2022
- Meeting with CAA representatives Ms. Kathleen Dematera and Ms. Naressa Saripada on July 28, 2022
- Meeting with TESDA, DOE, CavSU, TUP and EVAP on August 12, 2022

In addition to these meetings, the consultant was also provided a copy of the minutes of the March 2, 2022 meeting between TESDA, CavSU, DOE, UNDP, EVAP, and CAA. These minutes were thoroughly reviewed by the consulting team already, giving them a current status of this initiative and what the preferences of each stakeholder are. The succeeding meetings discussed below are intended to validate these understandings, to harmonize our planned activities with each stakeholder, and to create a more specific direction for the project.

Below are the key takeaways from the meetings which are primarily relevant to this initiative:

- The local e-car market is growing and the demand for e-car servicing will be rising. This is supported by the provisions of the recently passed EV Bill. This new UNDP initiative may focus on this.
- The competency standard being developed by DOE and CavSU are limited to e-trikes and e-jeeps. While not explicitly stated in the document, this was confirmed by EVAP.

- CAA is currently developing and conducting EV training programs particularly for local government units (LGUs) through an international grant. They may opt to transfer their training materials to TESDA at the end of their project.

Meeting with EVAP

A key agenda in this meeting was to determine how the UNDP initiative can avoid duplicating the efforts of DOE and CavSU, given that they already had drafted a Competency Standard (CS) entitled "Pure Battery Propelled Electric Vehicle Servicing Level II". The consulting team had reviewed this CS already prior to this meeting, and a brief analysis and comparison of this CS with other similar courses in other countries can be found at the latter portion of this report. In this meeting, EVAP confirmed that this CS developed by DOE and CavSU basically caters to electric tricycles (e-trikes) and electric jeepneys (e-jeeps) only, even though the document itself does not specifically state this differentiation.

Looking into the fleet management and charging infrastructure side, EVAP expressed that these are not urgent needs as of now. Thus, the focus of this immediate project has to be on the operations and servicing of vehicles.

An interesting point brought up in this meeting was the entry of imported electric cars (e-car) in the Philippines. More than 10 battery-electric and hybrid electric cars can now be purchased locally in the Philippines by dealers such as Mitsubishi, Hyundai, BYD, Porsche, Audi and Jaguar. And yes, these local dealers already have serviced these e-cars locally. The most likely scenario is that each company is training its own technicians for servicing of their own e-car and e-SUV models.

According to the data of EVAP, e-car sales (e-SUVs included) have picked up in the last 5 years, though hampered by the pandemic. As of 2021, there are 311 registered e-cars and 43 e-SUVs in the Philippines. Based on these statistics, this seems to be a good area where the UNDP project team can focus on since the DOE and CavSU team have already covered the needs of the e-trike and e-jeepney sector. The contents of this CS by DOE and CavSU are summarized and compared with a few similar CS from other countries towards the latter part of this report.

Commented [3]: Consider paraphrasing this. Narrative may focus on the brief summary on what the DOE and CVSU developed

Commented [4R3]: The contents of what DOE and CVSU developed are summarized in a table a the end of this report.

EVAP confirmed that these local e-car dealers are members of EVAP and we can be endorsed to them to conduct interviews.

The official minutes of this meeting is attached to this report as an Appendix.

Meeting with CAA

The objective of this meeting was basically to learn about and align with the initiatives of CAA in this area. CAA shared about their own externally-funded project which allows them to develop training programs on servicing and maintenance of e-trikes. This project is currently on its second year and will end in December 2023. The program offered is free of cost, however, it is exclusive to local government units. The registered audience so far is only by invitation.

One of their concerns was regarding how to continue offering these training activities beyond their project funding period. Looking at the quality of their material developed by various experts and resource persons throughout the years, it would be a waste to not sustain these beyond December 2023. Thus, the consultant recommended to facilitate a discussion with TESDA for them to be able to possibly pass on to TESDA their training materials, and potentially have it accredited so that other interested training centers

can take over after their project funding period. This activity can be made part of the training curriculum development period of this UNDP project.

Meeting with TESDA, DOE, CavSU, TUP and EVAP

This meeting was organized and called by TESDA, to harmonize everyone's efforts on this agenda. Everybody was given a chance to discuss their own initiatives and contributions. However, the main focus of the meeting was basically on how the CS developed by DOE and CavSU can be upgraded into a Training Regulation (TR). This is because the objective of DOE is to produce a number of NC II graduates on this topic by December 2022.

As the primary consultant in this initiative, I facilitated this discussion, and basically what we understood was that TESDA's requirements for TR application changed during the period CavSU and DOE were writing their material. As a result, they were not able to submit all the requirements needed to meet the criteria for a TR. For example, while CavSU conducted a skills mapping activity to produce this CS, they did not use the official skills mapping survey tool approved by TESDA. Thus, this is one key requirement which they need to produce in order to proceed to the next step. This tool will primarily establish the need for this training program, and establish the industry demand for graduates of this potential TR. The primary purpose of establishing the demand is to ensure that the TR will not be unutilized for a long period of time. The requirement of TESDA is that the demand for these graduates should pick-up within 5 years of approval of the TR.

However, more issues were raised as according to EVAP, there is currently zero demand for this training program right now (i.e. the one developed by DOE and CavSU). If they will ask the industry to answer this skills mapping survey tool, EVAP is sure that the result will be that there is no need for this training program.

However, EVAP and DOE are convinced that even without the demand yet, TESDA should proceed with the development of these training programs to prepare the industry. Otherwise, it might be too late for the government to act on this. TESDA agreed, and basically, the direction we proposed was for EVAP to answer this skills mapping survey tool alone, as the representative of the local EV industry. Coincidentally, EVAP is also developing the Comprehensive Roadmap for the Electric Vehicle Industry (CREVI) for the Department of Energy, wherein, they interviewed required number of industry representatives. Thus, the response of EVAP in this skills mapping survey will not only represent one position, but it can be covering the whole industry already. Furthermore, DOE will also indicate its initiatives and directions in this survey questionnaire to give support to this requirement and demonstrate that the demand will be driven by DOE's new policies in the near future. The sentiment of EVAP and DOE is that the demand for this will be more of policy-driven and will be dependent on the implementation of the CREVI.

Staff from TUP will be EVAP's manpower in conducting the additional survey needed in order to estimate the future demand for these technicians. My team had a follow-up meeting with EVAP, CavSU and TUP on August 15, 2022 to talk about the methodology for this survey.

Commented [5]: Are there any possible tools that can be used to determine the possible demand for the said training programs?

Commented [6R5]: TESDA requires that its own tool be used to assess the demand. However, according to EVAP, using the same tool as is will guarantee a negative response from the industry since the market is not there yet. Thus, the team agreed in the meeting that EVAP will answer the TESDA survey tool to represent the industry, basing their responses from the modeling results conducted for the CREVI. The DOE agreed to give inputs also to establish that the future demand will be created by the new EV bill. Additional surveys will be commissioned by EVAP to gather information on the manpower requirement per position.

Commented [7]: Agree. However, if this is the outlook for demand, how then do we exactly determine that there will be a demand? Perhaps IRR provisions can be cited that would support this assumption/outlook.

Commented [8R7]: Although CREVI has not yet been implemented, the direction for CREVI is readily available so perhaps the team can look into it and ensure that the initiatives being proposed are align to CREVI's targets/work plan. Further, majority of questions/issues not addressed during the IRR Public Consultations are said to be addressed in the CREVI, with that, the team can have an insight on the stakeholders' concerns with regard to EV Industry

Commented [9R7]: I agree. We agreed in the meeting that EVAP's responses in the TESDA skills mapping questionnaire/survey tool will be based on the CREVI. Afterall, Dr. Biona from EVAP is also one of the main proponents of the CREVI.

TESDA's Automotive Training Programs

Table 2 lists all the accredited training programs of TESDA which relates to the automotive sector. It also indicates the total number of registered training centers offering each program.

Based on the information obtained from TESDA, the most widely offered automotive-related course is the Driving NC II course with 556 registered training centers offering it. This is followed by Automotive Servicing NC I (220 registered training centers) and Automotive Servicing NC II (279 registered training centers). The Motorcycle/Small engine servicing course (104 registered training centers) is also notable.

The core competencies of the various automotive servicing courses of TESDA are compared on Table 1. In the simplest of terms, the NC I course is basically for pre-delivery inspection and performance of preventive maintenance work on vehicles. The NC II version adds knowledge and understanding of a couple of basic components to the competency, mostly mechanical components. The NC III version introduces electrical and electronics servicing, the automatic transmission system, more in-depth understanding of the engine components, the air conditioning system, and the capability to perform vehicle diagnostics. Furthermore, the NC IV version adds familiarity to advanced safety features such as the anti-lock braking system, most on-board vehicle management systems, emissions and environmental compliance, the fuel injection system, and the ability to cost estimate jobs.

Analyzing the contents of the Automotive Servicing courses, it is suggested that training centers who currently offer the NC III and NC IV versions can be given preferences to potentially offer EV training courses. This is because of infrastructure available with them to conduct these trainings effectively and efficiently.

Table 1. Comparison of Core Competencies of the Automotive Servicing Courses

NC I	NC II	NC III	NC IV
Pre-delivery inspection	Automotive Battery and Charging	Basic Electronic and Electrical Systems (e.g. security system, elec. Steering and suspension systems, warning system)	Advanced Safety Systems/Features (e.g. ABS, traction control)
Periodic maintenance of the engine, drive train, brakes, suspension and steering	Ignition and starting system	Engine Management System	Most Vehicle Management Systems
	Wiring and lighting systems	Engine Overhaul	Emission and Environmental Compliance
	Basic mechanical systems (e.g. clutch, steering, differential, axle, brakes and suspension)	Automatic Transmission Servicing	Job cost estimation

	Overhaul of Manual Transmission	Auto Air Conditioning System	Continuous improvement
		Engine-related systems	Fuel Injection System
		Vehicle diagnostics	

*The terms servicing, repair and check-up have been omitted above to avoid redundancy.

On the other hand, following are courses which are offered by very few training centers:

- 2 years diploma in Automotive Technology
- Auto engine Rebuilding NCII
- Automotive Body Painting/Finishing NC I
- Automotive Body Painting/Finishing NC II
- Automotive Body Repairing NC II
- Automotive Electrical Assembly NC II
- Automotive Electrical Assembly NC II - Mobile Training Program
- Automotive Electrical Assembly NC II - Mobile Training Program
- Automotive Servicing (Electrical Repair) NC II
- Automotive Servicing (Engine Repair) NC II
- Diesel Fired Boiler Operation
- Driving NC III
- Motorcycle/Small Engine Servicing NC II (leading to Overhaul Motorcycle/Small Engine
- Service Automotive Electrical Component Leading to Automotive Servicing NC II
- Service Motorcycle/Small Engine System Leading to Motorcycle/Small Engine Servicing NC II
- Train Driving Level II

Looking at the number of enrolled, graduates, assessed and certified candidates for each course, the courses with the most number of training centers offering them are also the most availed ones. . Likewise, the highest demand is recorded in the driving, automotive servicing, and motorcycle servicing courses. According to TESDA, the discrepancy in the number of enrollees, graduates, assessed and certified can be due to backlogs or carry-overs from previous years. Additionally, it can also be due to candidates who get their training from their actual workplace and only come to TESDA for certification. This is possible as long as they can present a certificate of employment from a related industry. . Understandably, TESDA mentioned to us in one of our meetings that candidates who undergo enterprise-based training, have experienced better employability.

Commented [10]: Kindly clarify as the data presented focuses on the
1) breakdown of enrollees, graduates, assessed and certified by courses offered
2) centers in each region
(not necessarily the enrollees per region)

Commented [11R10]: Also, kindly identify data source for figures presented

Commented [12R10]: I have added the source of the data (TESDA) and clarified the information in the text.

Table 2. Total number of available training centers and students per automotive courses offered. (Source: TESDA)

COURSES OFFERED	TOTAL NUMBER OF TRAINING CENTERS	AS OF 2021			
		Enrolled	Graduates	Assessed	Certified
2 years Diploma in Automotive Technology	1				
Auto Engine Rebuilding NC II	1	-	-	-	-
Automotive Body Painting/Finishing NC I	2	-	-	-	-

COURSES OFFERED	TOTAL NUMBER OF TRAINING CENTERS	AS OF 2021			
		Enrolled	Graduates	Assessed	Certified
Automotive Body Painting/Finishing NC II	3				
Automotive Body Repairing NC II	2	-	-	6	6
Automotive Electrical Assembly NC II	2	-	-	-	-
Automotive Electrical Assembly NC II - Mobile Training Program	1				
Automotive Servicing (Electrical Repair) NC II	1	-	-	12	12
Automotive Servicing (Engine Repair) NC II	2	-	-	39	39
Automotive Servicing NC I	220	124	99	4,885	4,349
Automotive Servicing NC I - Mobile Training Program	12				
Automotive Servicing NC II	279	419	315	9,057	8,100
Automotive Servicing NC II - Mobile Training Program	18				
Automotive Servicing NC III	8	34	-	155	123
Automotive Servicing NC IV	3	-	-	175	153
Automotive Wiring Harness Assembly NC II	4	-	-	167	158
Driving (Articulated Vehicle) NC III	6	-	-	1,820	1,750
Driving (Passenger Bus/Straight Truck) NC III	25	-	-	3,950	3,716
Driving (Passenger Bus/Straight Truck) NC III - Mobile Training Program	5				
Driving NC II	556	1,027	903	54,414	50,707
Driving NC II - Mobile Training Program	60				
Motorcycle/Small Engine Servicing NC II	84	45	43	5,566	5,083

COURSES OFFERED	TOTAL NUMBER OF TRAINING CENTERS	AS OF 2021			
		Enrolled	Graduates	Assessed	Certified
Motorcycle/Small Engine Servicing NC II - Mobile Training Program	20				
Motorcycle/Small Engine Servicing NC II (leading to Overhaul Motorcycle/Small Engine	1				
Service Automotive Electrical Component Leading to Automotive Servicing NC II	1				
Service Motorcycle/Small Engine System Leading to Motorcycle/Small Engine Servicing NC II	4				
Train Driving Level II	1				

Figure 1 illustrates the distribution of training centers per region. It is interesting to find out that the highest number of training centers can be found in the Mindanao area (i.e. Regions X and XII), followed by Regions III, IV-A and IX. The data is contrary to the expectation that most number of training centers would be near the automotive industry, which is in Region IV-A. However, this is understandable since the majority of courses being offered are in the servicing, repair and maintenance domain and are not so much on the manufacturing and assembly aspect. It is also notable to mention that very few training centers offering automotive courses can be found in the CAR and CARAGA regions.

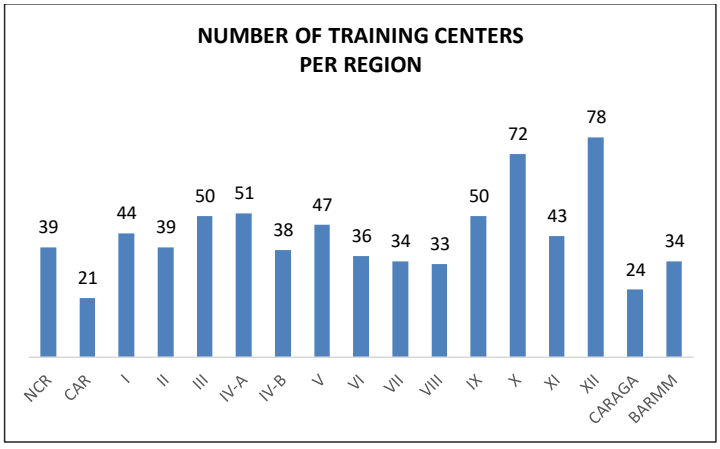

Figure 1. Total number of training centers per region

To further understand the data, the number of training centers has been broken down into public and privately-owned as shown in Figure 2. Another interesting observation is that the regions with the highest number of training centers are dominated by privately-owned training centers, suggesting that the private sector plays a big role in expanding the reach of TESDA in these regions. On the other hand, regions which lag in terms of the number of training centers are dominated by public training centers, showing that the government is actively making its presence felt in these areas, in response to the lack of private investors opening training centers.

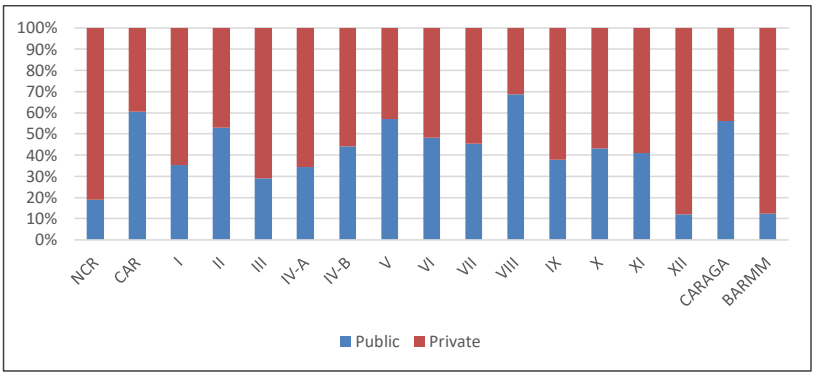

Figure 2. Share of Public and Private Training Centers per region.

A good split of driving and automotive servicing courses are found in regions with more number of training centers. In more highly urbanized areas (i.e. III, IV-A and VI), it is observed that a significant number of training centers offer driving courses for passenger buses and trucks.

Understandably, Automotive Body Painting, one of the very few courses which belong to the manufacturing sector, can be found in Region IV-A wherein most of the automotive manufacturers have located.

Motorcycle/Small Engine Servicing is a growing industry throughout the country, echoing the increasing number of two-wheeled vehicles on the road in recent years.

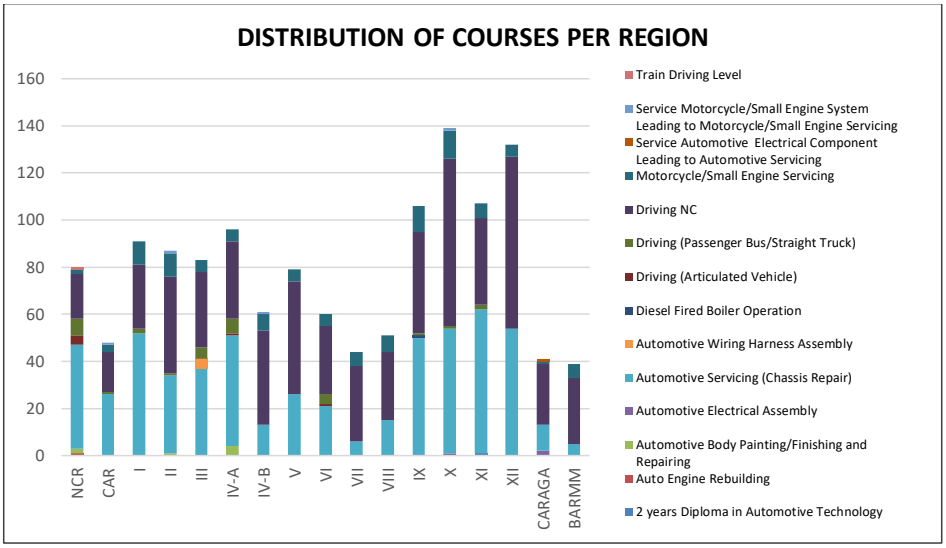

Figure 3. Number of courses per region

Strengths, Weaknesses, Opportunities and Threats

*Based on the analysis of existing TESDA Programs and the current status and outlook of the local and global electric vehicle industry.

- **STRENGTHS**

- There is a significant number of training centers offering automotive servicing (chassis repair) courses throughout the country. This is beneficial for the EV industry since the suspension and chassis system are largely similar with the traditional ICE vehicles. However, existing programs have to be integrated with safety-related measures due to chassis-integrated battery-packs of some electric cars.
- There are plenty of training centers offering professional driving courses across the country. As familiarity with the peculiarities, especially the safety, of driving an electrical vehicle is important, the same training centers should be able to easily integrate this into their existing driver training programs.
- There is a notable presence of Motorcycle/Small Engine Servicing courses throughout the country. The emerging two- and three-wheeled EV market can benefit from the significant interest in this area, both by applicants and investors.

- **WEAKNESSES**

- There is limited manufacturing and assembly-related training capability.
- The current CS on Pure Battery EV has limited to no coverage of electronic and control-related topics.
- Limited to non-existent training programs on battery pack design.

- **OPPORTUNITIES**

- Greater than 50% of training centers in **Regions CAR, II, V, VIII, and CARAGA** are government-owned and operated. These enables them to easily adapt to new programs and requirements.
- There are more than 10 electric car models already being sold in the country as of writing (e.g. by BYD, Porsche, Mitsubishi, and Hyundai, to mention a few). This suggests that enterprise-based training for EV technicians have already somehow commenced locally since the local dealerships have to be able to service these vehicles. The local demand for electric car technicians have already started.
- The EV Bill has lapsed into law on April 15, 2022. This enables the Comprehensive Roadmap for the Electric Vehicle Industry to be developed by the Department of Energy. Expected to be completed by December 2022, this will pave the way for at least 5% of commercial and government fleets to be converted into electric, creating the demand for new electric vehicle service technicians.
- Higher level TRs for Automotive Servicing (i.e. Levels 3 and 4) include familiarity with electronic, vehicle management and vehicle control systems, paving the way for the requirement of EVs.
- If the Philippines moves fast in this area, it can be a potential resource for professional electric vehicle servicing manpower internationally, especially in Southeast Asia.

- **THREATS**

- Aversion of electric car companies to share technical information and expertise in the development of a new higher-level CS or TR for EV servicing.
- Similarly, lack of a local electric car industry (i.e. manufacturing and/or assembly) reduces the need to servicing as of the moment. There is a larger opportunity if manufacturing and assembly can also be covered locally.
- Fast development and evolution of electric vehicle technology, especially in the battery and charging equipment aspects. The development of training materials have to consider this factor.
- The lack of presence of a lithium-ion battery industry in the country can hamper the development of servicing and troubleshooting capabilities.

Benchmarking of Pure Battery Propelled Electric Vehicle Servicing with selected countries

Similar qualification packs (QP) from India and Canada have been compared with the CS of TESDA for Pure Battery Propelled Electric Vehicle Servicing Level II. The following observations below have been noted. The consulting team also notes that some of these are possibly due to the fact that they could only be required for Training Regulations (TRs) and not for Competency Standards (CS). This is for confirmation with TESDA.

1. **Minimum Educational Qualification & Experience of Trainee:** Specific qualifications need to be mentioned by TESDA in the CS. For example, Industrial Training in electrical and electronics, diploma in mechanical and/or automotive, etc.

2. **Trainer Certification Criteria:** Not mentioned in the CS defined by TESDA. This is mandatory however missing in TESDA's CS. The trainer is the one who will be training the trainees.
3. **Master Trainer Certification Criteria and Eligibility Criteria:** Not mentioned in the CS defined by TESDA. This is mandatory. This is well defined by the Automotive Skills Development Council (ASDC) of India in their QP. The Master Trainer is the one who will be training the trainers.
4. **Assessor Certification and Strategy:** This is well-defined by the ASDC. This is mandatory, but however missing in TESDA's CS. Assessors are the ones who assess the trainee for the certification. An assessor should be external to the training partners.

The full comparison is summarized on Table 3 below.

Table 3. Comparison of current Pure Battery EV CS draft with other similar programs in other countries.

Sector Skill Council	**Automotive and Land Transportation Sector, TESDA**	**Automotive Skill Development Council, India**	**RED SEAL - SCEAU ROUGE Canada Skill Development**
QP Name	Pure Battery Propelled Electric Vehicle Servicing Level II	Electric Vehicle Service Lead Technician	Diagnoses And Repairs Hybrid and Electric Vehicles (EV)
QP No		ASC/Q1424	AST-445 (RSOS Sub-task: H22 & H23)
Level	II	V	IV
Minimum Educational Qualification & Experience of Trainee	Trainees or students wishing to enroll in this course should possess the following requirements. • Must have basic communication skills • Must have basic arithmetic skills This list does not include specific institutional requirements such as educational attainment, appropriate work experience, and others that may be required of the trainees by the school or training center delivering the TVET program.	I.T.I (Mechanic Motor Vehicle) with minimum 1 Year of experience in Automotive Service OR I.T.I (Mechanic Auto Electrical and Electronics) with minimum 1 Year of experience in Automotive Service OR Certificate-NSQF (Four Wheeler Service Technician/Automotive Electrician Level 4) with minimum 2 Years of experience in Automotive Service	**Not Mentioned**

Sector Skill Council	Automotive and Land Transportation Sector, TESDA	Automotive Skill Development Council, India	RED SEAL - SCEAU ROUGE Canada Skill Development
Trainers Qualification	• Must be a holder of any Training of Trainer's Certificate (e.g. Trainer's Methodology Certificate (TMC) OR must be a practicing trainer for two (2) years within the last five (5) years; • Must have two (2) years industry experience within the last five (5) years relevant to Pure Battery Propelled Electric Vehicle	1. ITI - Mechanic Motor Vehicle: 01 to 04 Years of experience in 4W servicing, 2. Diploma in Automobile Engineering/ Mechanical Engineering: 03 Years of experience in 4W servicing, 3. B.E. in Automobile/ Mechanical / Electrical/ Engineering: 02 Years of experience in 4W servicing,	**Not Mentioned**
Scope	Servicing of 2-wheeled, 3-wheeled and 4-wheeled pure battery electric vehicle.	Servicing of Four-Wheeler	**Not Mentioned**
Trainer Certification Criteria	**Not Mentioned**	**Domain Certification:** 1. "Electric Vehicle Service Lead Technician", "ASC/Q1424, v1.0", Minimum accepted score is 80%.	**Not Mentioned**
	Not Mentioned	**Platform Certification:** 1. "Trainer", "MEP/Q2601, v1.0" with scoring of minimum 80%.	**Not Mentioned**
COMPETENCY MAPPING			
Basic	**400311214** Contribute to workplace innovation **400311218** Practice entrepreneurial skills in the workplace	Module 1: Introduction to the role of electric vehicle service lead technician	
	400311212 Solve/address general workplace problems **400311213** Develop career and life decisions	Module 1: Introduction to the role of electric vehicle service lead technician Module 2: Work Effectively and Efficiently Mapped to **ASC/N9801 v1.0**	

Sector Skill Council	Automotive and Land Transportation Sector, TESDA	Automotive Skill Development Council, India	RED SEAL - SCEAU ROUGE Canada Skill Development
	400311210 Participate in workplace communication **400311211** Work in team environment	Module 1: Introduction to the role of electric vehicle service lead technician Module 2: Work Effectively and Efficiently Mapped to **ASC/N9801 v1.0** Module 4 - Communicate Effectively and Efficiently Mapped to **NOS ASC/N9802 v1.0**	
	400311215 Present relevant information	Module 1: Introduction to the role of electric vehicle service lead technician Module 4 - Communicate Effectively and Efficiently Mapped to **NOS ASC/N9802 v1.0**	
	400311216 Practice occupational safety and health policies and procedures **400311217** Exercise efficient and effective sustainable practices in the workplace	Module 1: Introduction to the role of electric vehicle service lead technician Module 2: Work Effectively and Efficiently Mapped to **ASC/N9801 v1.0** Module 3 - Optimize Resource Utilization Mapped to **NOS ASC/N9801 v1.0**	22.01 Implements specific safety protocols for hybrid and electric vehicles.
Common	**ALTXXXXXX** Validate electric vehicle specification	Module 6: Carry out service, repair and overhauling of mechanical aggregates in the vehicle Mapped to **NOS ASC/N1436 v1.0**	22.02 Diagnoses hybrid and electric vehicle systems. 23.01 Repairs hybrid vehicle systems. 23.02 Repairs electric vehicle systems.
	ALTXXXXXX Move and position electric vehicle	Module 6: Carry out service, repair and overhauling of mechanical aggregates in the vehicle Mapped to **NOS ASC/N1436 v1.1**	
	ALT723214 Utilize automotive tools	Module 6: Carry out service, repair and overhauling of mechanical aggregates in the vehicle Mapped to **NOS ASC/N1436 v1.2**	

Sector Skill Council	Automotive and Land Transportation Sector, TESDA	Automotive Skill Development Council, India	RED SEAL - SCEAU ROUGE Canada Skill Development
	ALT723215 Perform mensuration and calculation	Module 6: Carry out service, repair and overhauling of mechanical aggregates in the vehicle Mapped to **NOS ASC/N1436 v1.3**	
	ALT723216 Utilize workshop facilities and equipment	Module 6: Carry out service, repair and overhauling of mechanical aggregates in the vehicle Mapped to **NOS ASC/N1436 v1.4**	
	ALT723217 Prepare servicing parts and consumables	Module 6: Carry out service, repair and overhauling of mechanical aggregates in the vehicle Mapped to **NOS ASC/N1436 v1.5**	
	ALT723218 Prepare vehicle for servicing and releasing	Module 6: Carry out service, repair and overhauling of mechanical aggregates in the vehicle Mapped to **NOS ASC/N1436 v1.6**	
Core	**ALTXXXXXX** Repair electric motors and controls **ALTXXXXXX** Replace battery	Module 5: Carry out diagnosis of electric vehicle for repair requirements Mapped to **NOS ASC/N1435 v1.0** Module 7: Carry out service, repair and overhauling of electrical and electronic systems within an aggregate in the vehicle Mapped to **NOS ASC/N1437 v1.0**	22.02 Diagnoses hybrid and electric vehicle systems. 23.01 Repairs hybrid vehicle systems. 23.02 Repairs electric vehicle systems.
	ALTXXXXXX Perform periodic maintenance	Module 5: Carry out diagnosis of electric vehicle for repair requirements Mapped to **NOS ASC/N1435 v1.2** Module 6: Carry out service, repair and overhauling of mechanical aggregates in the vehicle Mapped to **NOS ASC/N1436 v1.6** Module 7: Carry out service, repair and overhauling of	22.02 Diagnoses hybrid and electric vehicle systems. 23.01 Repairs hybrid vehicle systems. 23.02 Repairs electric vehicle systems.

Sector Skill Council	Automotive and Land Transportation Sector, TESDA	Automotive Skill Development Council, India	RED SEAL - SCEAU ROUGE Canada Skill Development
		electrical and electronic systems within an aggregate in the vehicle Mapped to **NOS ASC/N1437 v1.0**	
Assessor Certification	Not Mentioned	**1. Domain Certification:** "Electric Vehicle Service Lead Technician", "ASC/Q1424, v1.0", Minimum accepted score is 80% **2. Platform certification** Assessor", "MEP/Q2701, v1.0" with scoring of minimum 80%	Not Mentioned
Assessment Strategy	Not Mentioned	Mentioned	Not Mentioned

Synthesis and Moving Forward

The SWOT analysis above shows that this is definitely an area worth spending national efforts on, and there are definitely a number of gaps which can be filled by this initiative.

Having good discussions with key stakeholders and getting a decent understanding of the existing capacity of TESDA in the automotive sector, the project team believes that there are a number of potential directions now available for the project, which the consulting team aims to finalize with UNDP and TESDA.

First is, the maintenance and servicing of e-cars could become the focus of this UNDP initiative. This is given the fact that the servicing and maintenance of e-trikes and e-jeeps are already being attended to primarily by DOE and CavSU, with assistance from EVAP, TUP and the UNDP consulting team. However, it is important to ask the question of whether developing vehicle segment-specific training programs would be a welcome idea to the stakeholders.

Commented [13]: Pursue avenues or partnership with manufacturers to ensure transfer of technical information and expertise in the development of a new higher-level CS or TR for EV servicing - manufacturers may select their technicians from the pool based on the TR developed by TESDA

Commented [14R13]: The manufacturers will definitely be involved in this project. They will be our target respondents in the skills mapping survey for e-car technicians. We will try our best to get them as involved as possible and sell to them the idea that in the long run, this will also help them reduce the cost of training their personnel and help them get better quality hires.

Commented [15]: Also explore the inclusion of the harmonization of the skills training levels, qualification standards, scope, criteria, etc. with (applicable) international standards and/or with similar countries.

Commented [16R15]: Thank you for the suggestion. We will definitely do this. I am currently working also with an India-based consulting firm who is very familiar with electric vehicles (pManifold) to do this.

Comparing the needs of e-trikes, e-jeeps and e-cars, the UNDP consulting team observed that there is scope to further add some important parameters related to vehicle diagnostics which will strengthen and fool-proof the existing CS. For example, e-cars would feature a more sophisticated vehicle diagnostics system, vehicle management system, advanced electrical safety due to the higher voltages found in these types of vehicles, and the presence of cooling systems within the battery packs.

Furthermore, instead of developing a completely new CS or TR, what is possible is for the UNDP consulting team is to build on what DOE and CavSU have already developed. Basically, the UNDP consulting team may opt to develop a CS or TR with just a higher competency level than the existing one (i.e. higher than Level II). This higher competency level training program will include more advanced systems, and bits and pieces of the same basic and common competencies already identified by the DOE-CavSU team. This is congruent with how the current Automotive Servicing course is designed from Levels I to IV.

Commented [17]: Do we have an assessment of what DOE and CVSU have already developed?

Commented [18R17]: Yes, right now we have a high-level assessment. We compared it with two similar CS from other countries.

Additionally, another potential route would be to enhance the existing CS developed by the DOE-CavSU team, based on the comments provided in the preceding section.

Summary of Questions for Stakeholders:

1. Is developing vehicle segment-specific training programs a welcome idea?
2. Is the current CS developed by DOE and CavSU still open to changes/improvements?
3. Is TESDA open to develop a higher competency level version of the Pure Battery EV CS, i.e. Level III, IV or V, to cater to the needs of e-cars?

A revised workplan follows this report as the first Appendix. The consulting team looks forward to feedback from UNDP and its stakeholders in order to finalize the direction of this project.

Appendices

1. Revised Workplan
2. TESDA's Competency Standard for Pure Battery Propelled Electric Vehicle Servicing Level II
3. TESDA's Training Regulation for Automotive Servicing NC I, II, III and IV
4. Meeting Minutes with EVAP – 18 July 2022
5. Meeting Minutes with CAA – 28 July 2022
6. Meeting Minutes with TESDA, DOE, EVAP, TUP and CavSU – 12 August 2022

Commented [19]: As discussed during the meeting, the revised workplan indicates that D1 should include the methodology. Hence, discussion on methodology should be included in this inception report (with reference to the revised workplan).

Commented [20R19]: The submitted workplan itself is actually very detailed. I believe it sufficiently provides details on the methodology already. If it helps, I can add a flowchart here. The methodology is basically just following the standard procedure of TESDA for the development of new course materials.