

## Accelerating the adoption and life-cycle solutions to electric mobility in Thailand

### Basic Information

**GEF ID**

10681

**Countries**

Thailand

**Project Title**

Accelerating the adoption and life-cycle solutions to electric mobility in Thailand

**GEF Agency(ies)**

UNIDO

**Agency ID**

UNIDO: 180285

**GEF Focal Area(s)**

Climate Change

**Program Manager**

Milena Vasquez

# PIF

## Part I – Project Informatic

### Focal area elements

**1. Is the project/program aligned with the relevant GEF focal area elements in Table A, as defined by the GEF 7 Programming Directions?**

#### Secretariat Comment at PIF/Work Program Inclusion

10/12/2020: Yes, the project is aligned with the GEF's CCM GEF-7 focal area strategy.

#### Agency Response

### Indicative project/program description summary

**2. Are the components in Table B and as described in the PIF sound, appropriate, and sufficiently clear to achieve the project/program objectives and the core indicators?**

#### Secretariat Comment at PIF/Work Program Inclusion

10/12/2020: Please clarify the following:

Component 1 - please clarify if this component and associated outcome would be at the national scale or at the regional (i.e. EEC) scale. Please add respective clarifying language to the component and outcome title.

Component 2 - likewise for this component, which is focused on the EEC. Please add language that clarifies the scope of the component and outcomes.

Component 3 - please clarify if this component and associated outcome would be at the national scale or at the regional (i.e. EEC) scale. Please add respective clarifying language to the component and outcome title.

Output 2.2.2 - please clarify and reformulate this output. Is the goal to develop a plan for the optimized location of electric vehicle chargers or is the goal to apply big data?

10/16/2020:

- Component 1 - scope has been clarified to have been national. Comment cleared.
- Component 2 - scope has been clarified for the three outputs in this component. Comment cleared.
- Output 2.2.2 - Rewording has clarified output. Comment cleared.

All above comments cleared.

## **Agency Response**

10/14/2020

- Component 1 would be at national level and scale. Clarifying language has been added to the component and outcome title.
- Component 2 is split between national and regional level: Outcome 2.1 would be at the national level with linkages to demonstrations locally at EEC, while outcomes 2.2 and 2.3 would be at the regional (EEC) scale. Language has been updated to reflect this.
- Output 2.2.2 would accomplish both of these things - by applying big data, optimal location of electric vehicle chargers would be determined. The output has been reworded to clarify the connection between these items.
- In addition, outputs 1.1.2, 3.1.1 and 3.1.3 have all been amended to add more explicit gender dimensions.

## **Co-financing**

**3. Are the indicative expected amounts, sources and types of co-financing adequately documented and consistent with the requirements of the Co-Financing Policy and Guidelines, with a description on how the breakdown of co-financing was identified and meets the definition of investment mobilized?**

## **Secretariat Comment at PIF/Work Program Inclusion**

10/12/2020: Yes, total co-financing of \$19,684,900 is expected, of which \$14,685,900 is expected to be mobilized. These amounts have been described properly. By CEO endorsement, it will be important to clarify the expected contribution from the private sector which has

been estimated as \$14 million from project beneficiaries. Without this investment the co-financing may not be adequate for the project.

#### **Agency Response**

10/14/2020

- This comment is duly noted. Indeed, these contributions will be further clarified during PPG to ensure adequate co-financing.

#### **GEF Resource Availability**

**4. Is the proposed GEF financing in Table D (including the Agency fee) in line with GEF policies and guidelines? Are they within the resources available from (mark all that apply):**

**Secretariat Comment at PIF/Work Program Inclusion 10/12/2020:** Yes, the amount is in line with the GEF policies and guidelines.

#### **Agency Response**

**The STAR allocation?**

**Secretariat Comment at PIF/Work Program Inclusion 10/12/2020:** Yes, this amount is available in Thailand's GEF CCM STAR.

#### **Agency Response**



**The focal area allocation?**

Secretariat Comment at PIF/Work Program Inclusion 10/12/2020: Yes, this amount is available in Thailand's GEF CCM STAR.

**Agency Response**

**The LDCF under the principle of equitable access**

Secretariat Comment at PIF/Work Program Inclusion N/A

**Agency Response**

**The SCCF (Adaptation or Technology Transfer)?**

Secretariat Comment at PIF/Work Program Inclusion N/A

**Agency Response**

**Focal area set-aside?**

Secretariat Comment at PIF/Work Program Inclusion N/A

Agency Response

Impact Program Incentive?

Secretariat Comment at PIF/Work Program Inclusion N/A

Agency Response

Project Preparation Grant

5. Is PPG requested in Table E within the allowable cap? Has an exception (e.g. for regional projects) been sufficiently substantiated? (not applicable to PFD)

Secretariat Comment at PIF/Work Program Inclusion 10/12/2020: Yes, the PPG requested is within the allowable cap and is available in Thailand's STAR.

Agency Response

Core indicators

6. Are the identified core indicators in Table F calculated using the methodology included in the correspondent Guidelines?

**Secretariat Comment at PIF/Work Program Inclusion**

10/12/2020: Core indicator table has been properly filled out. Please clarify the following:

- Please provide additional details for the calculation of the estimated GHG mitigated for direct, secondary direct and indirect including grid emissions factor, etc.
- Please clarify the target for the 2 MW of solar PV under indicator 6.4 for which there is no explanation provided.

10/16/2020: Core indicator calculations have been further clarified. Comments cleared.

**Agency Response**

10/14/2020

- Detailed calculations have been included as a separate attachment to the submission. In addition, reference to the attachment has been included under the core-indicator table.
- With respect to the explanation on the 2 MW of solar PV under indicator 6.4: This is a result of installation of 0.5 MW capacity for solar charging station for e-songthaews + 1.5 MW capacity of solar-powered charging stations (30 chargers, each supplied by 50 kW of PV installation) – detailed calculation is also provided in the attachment.

**Project/Program taxonomy**

**7. Is the project/ program properly tagged with the appropriate keywords as requested in Table G?**

Secretariat Comment at PIF/Work Program Inclusion 10/12/2020: The project is properly tagged.

## Agency Response

### art II – Project Justification

1. Has the project/program described the global environmental / adaptation problems, including the root causes and barriers that need to be addressed?

#### Secretariat Comment at PIF/Work Program Inclusion

10/12/2020: Overall, the global environmental problems and root causes and barriers are well described. Please address the following:

- Please correct the reference to Thailand's Second National Communication. The inventory cited of 2013 is actually included in the more recent Third NC or Second BUR.

- The specific barriers to wider adoption and production of e-mobility are not entirely clear considering the very strong baseline scenario presented following this section. Additional clarification of these and incremental reasoning for the project should be strengthened. While more details will be clarified during PPG, a systems analysis at this stage should provide some more specificity on these. See below for examples:

- **New product and production standards related to EVs and testing facilities** -> The Industrial Product Standards Committee and the Thai Industrial Standards Institute has approved a series of standards already. Are there standards remaining to be developed? Are lack of standards a barrier to manufacturing (according to existing manufacturing plans it would not appear so).
- **Thai entrepreneurs' technical capabilities on EVs and related technologies (particularly for the design and manufacturing) (reskill and upskill) and for the preparation of new skill labor for the EV industry** -> Professional development opportunities seem to be available at the Thai Automotive Institute and Department of Industry. Are there specific areas where additional capacities are needed?
- **Financial and non-financial incentives for EV consumers** -> This barrier could be elaborated as it appears there are existing incentives, but not enough uptake. Why?
- **Related infrastructure such as charging stations and power grid to support widespread use of EVs** -> There seems to be existing standards and targets, what specifically is needed to support to build up of a charging network?

- Considering that the grid emission factor is a major factor in the climate change mitigation potential of e-mobility, additional information

on the existing potential for decarbonization of the transport sector and how renewable energy scenarios could impact that is needed. Please provide.

10/16/2020: Correct reference to NC has been fixed. Additional clarifications have been provided for this section that address the comments above and provide additional details to the barriers currently being faced in Thailand. Comments cleared.

## **Agency Response**

10/14/2020

- Reference to Thailand's Third National Communication has been corrected.

- While very strong baseline scenario and numerous initiatives related to EVs are being developed, until now a targeted approach to enhance policy and institutional framework as well as to build capacities, raise awareness and catalyze investments for wide spread and scale up of e-mobility in Thailand has not been implemented. Gaps remain both on supply and demand side as elaborated in the relevant sections of the PIF. Additional details related to below categories have also been provided in the PIF and elaborated below:

### **New product and production standards related to EVs and testing facilities:**

A total of 21 standards have so far been issued by the Thai Industrial Standards Institute (TISI). The Committee will consider approving around 40 additional standards for next-generation vehicles, around 20 of which will be finished within this year, and the other 20 standards will be finished next year. TISI classifies Thai standards for EVs into 9 categories: 1) Sockets and outlets, 2) Charging systems, 3) Safety for various types of EVs, 4) Performance, 5) Motors, 6) Batteries, 7) Other equipment, 8) Communication system, and 9) Others. So far, Standards under Category 1, 2 and 5 and 7 have been almost completely developed and issued. However, most of standards under Category 3, 4, 6, and 8 have not been developed.

In addition, NSTDA has focused on the development of prototypes of certain types of vehicles for which Thai entrepreneurs have capability to upgrade their production, and to compete in the world markets, particularly BEV niche markets, including electric buses, electric minibuses, electric motorcycles, electric boats/ferries. Standards related to these other types of EVs such as buses, songthaews (modified pick-up trucks) and boats in Thailand have not been developed and issued.

Thus, overall, lack of standards, in particular related to new products, and production of EVs, such as songthaews, and testing facilities, is hindering the upscale of e-mobility and remains a major barrier to manufacturing of EVs in Thailand, that will be addressed by the proposed project.

### **Thai entrepreneurs' technical capabilities on EVs and related technologies**

The Thai Automotive Institute in collaboration with the Office of Industrial Economics provides capacity building for technicians on

Fundamentals of Electric Vehicles Technologies. In addition, the Department of Industry Promotion has provided a course and raised awareness about EV and autonomous vehicles, including producing manuals on next generation vehicles.

However, TAI's courses are only for technicians and only address the fundamentals of EV technologies while the Department of Industry Promotion has just started a course in 2020 as its first year for 40 participants. TAI has also identified the need for upgrading the current Thai entrepreneurs in the areas of the design and the manufacturing of EVs, and for the Office of Higher Education Commission (OHEC) under the Thai Ministry of Higher Education, Science, Research and Innovation to collaborate with technical universities to develop program or curricula particularly in the areas of the design and manufacturing of EVs and to prepare new skill labor for the EV industry. There is a need for increased professional development opportunities on EVs in education institutions, that will be addressed by the proposed project.

#### **Financial and non-financial incentives for EV consumers**

Based on EVAT's recent evaluation of the progress of the government's provision of financial and non-financial incentives for EV consumers, the progress with respect to creating sufficient incentives and making the prices of EVs affordable or appropriate for people to purchase has been considered relatively low. TAI has also identified the need for different stakeholders to work together to create more and stronger incentives, that will be addressed by the proposed project.

#### **Related infrastructure such as charging stations and power grid to support widespread use of EVs**

Although targets have been set, additional support and preparation is necessary for encouraging expansion of EV charging infrastructure across the country. Limited subsidy for selected charging stations has been provided but there is not sufficient financial support for other potential charging service providers as well as related regulations such as regulations to set electricity tariff at charging stations which still hinder the expansion of charging business, that will be addressed by the proposed project.

- **- Decarbonisation of transportation sector**

Existing potential for decarbonization of the transportation sector, apart from e-mobility (which is heavily dependent on electricity emission factor), covers the use of bio-fuels and hydrogen. While the bio-fuels constitute a relatively easy-to-implement mean of transport decarbonization it can have a negative side-effects for indirect GHG emission increase due to deforestation, land use change, agriculture and processing of biofuels, therefore it should not be considered as a major option for decarbonization. Another alternative is hydrogen, which also provides zero end-pipe GHG emissions, but the process of H<sub>2</sub> production is highly energy intensive – and depending on the source of this energy the net effect for the GHG emissions may be minimal reduction or even increase.

According to IEA report on hydrogen (June 2020), low-carbon production capacity [for hydrogen] remained relatively constant and is still off track with the Sustainable Development Strategy. More efforts are needed to: scale up to reduce costs; replace high-carbon with low-carbon hydrogen in current applications; and expand hydrogen use to new applications. Therefore despite the fact that hydrogen has long been known as a potential low-carbon transport fuel, establishing it in the transport fuel mix has been difficult mainly due to much higher investment cost compared to electric mobility solutions. Hydrogen is suitable for decarbonisation of industry and this particular solution would be more significant for mitigating GHG emission in Thailand.

This language has been added to the PIF at the end of Section 1, as a new section entitled "Decarbonisation of transport sector".

## 2. Is the baseline scenario or any associated baseline projects appropriately described?

### Secretariat Comment at PIF/Work Program Inclusion

10/12/2020: The baseline scenario is well described and quite strong. Please address the following:

- Please correct the language in reference to 'related projects from development banks, bilateral organizations, and/or other partners'. For example, the World Bank project described should be in the past tense and it should be clear how that project HAS informed the design of this project considering the direct relevance.

-The UNIDO GEF-5 project has also already been implemented, so the description should reflect that. What HAS BEEN achieved and how will the project apply lessons from that project?

10/16/2020: Language related to past and ongoing projects in the country has been revised and learning opportunities detailed. Additional exchange during PPG will help inform the full project design. Comments above cleared.

### Agency Response

10/14/2020

- Please correct the language in reference to 'related projects from development banks, bilateral organizations, and/or other partners'. For example, the World Bank project described should be in the past tense and it should be clear how that project HAS informed the design of this project considering the direct relevance.

Language has been corrected. Please refer to the section titled 'Related projects from development banks, bilateral organizations, and/or other partners'.

Lessons learned from the World Bank project titled 'The Chiang Mai Sustainable Urban Transport Project (GEF ID 4210)', in particular: i) Challenges related to the implementation of the 'Master Plan for the Development of Public Transportation' that took place after the GEF-4 project completion; and ii) Challenges related to the implementation of the technology demonstration that faced delays due to site selection given that many communities nearby the pilot site requested additional consultations which caused delays, especially on the civil work. Both consultancy and civil works were completed just before the closing date of March 31, 2014.

Based this lessons learned, the project will i) design a monitoring system that will be nationally embedded and take into consideration activities following the GEF-7 project completion, and ii) conduct consultations with relevant stakeholders and communities regarding the technology demonstration, in particular civil works, already at the stage of site selection.

Furthermore, additional exchanges with Chiang Mai Municipality and the World Bank's team are envisioned to take place during the PPG.

**The UNIDO GEF-5 project has also already been implemented, so the description should reflect that. What HAS BEEN achieved and how will the project apply lessons from that project?**

UNIDO GEF-5 project has entered third year of implementation (actual start date of project implementation is 5 December 2017). Language has been corrected accordingly.

While a number of initiatives to promote energy efficiency and foster the adoption of efficient technologies in SMEs exist in Thailand, a lack of awareness and capacity prevents the initiatives from having wide reaching and sustainable impact in the country. To address this gap, until now UNIDO GEF-5 project has successfully implemented set of coordinated measures including policy interventions, capacity building on low-carbon technologies and EnMS, and providing awareness raising trainings to targeted stakeholders.

This proposed project will aim to build on these interventions, utilizing and expanding capacities to include electric mobility targeting government, financial institutions, industries, and technical personnel.

### **3. Does the proposed alternative scenario describe the expected outcomes and components of the project/program?**

#### **Secretariat Comment at PIF/Work Program Inclusion**

10/12/2020: In addition to the comments in Part 1, Question 2, please address the following:

- Component 1 - Please clarify how this component will coordinate and build upon what is already existing and how it will link the national policy and institutional framework to the subnational (EEC region).

- Component 2 - Please clarify the expected target for the entrepreneurship support program. Is there an existing entrepreneurship ecosystem in the EEC (or will it be at a national level)? Will the project partner with key universities and research centers? How are the GEF resources expected to be used in this output and what kind of co-financing can be expected?

10/16/2020: Comments above have been clarified. Cleared.

#### **Agency Response**

- 10/14/2020



**Component 1 - Please clarify how this component will coordinate and build upon what is already existing and how it will link the national policy and institutional framework to the subnational (EEC region).**

This component will build on the results of the policy research project related to EVs implemented by the Thai Automotive Institute and its partners, and will be integrated with practical experiences, knowledge, and lessons to be developed and learned from Component 2. With TAI and EVAT joining the project, this component will coordinate with both organizations to ensure that this component will build upon the policy recommendations proposed by both organizations and their partners. In addition, this component will coordinate with both organizations to ensure that practical experiences, knowledge and lessons to be developed and learned from the subnational (the EEC region) under Component 2 will be brought up to the national level for developing additional policy and institutional framework at the national level, and ensure that this additional policy and institutional framework will be also practical and applicable to the subnational level such as in the EEC and other regions of the country during the implementation. Thus, this component will enhance the link between the national level and the subnational level when developing policy and institutional framework at the national level. Relevant clarification have been inserted in the PIF.

**Component 2 - Please clarify the expected target for the entrepreneurship support program. Is there an existing entrepreneurship ecosystem in the EEC (or will it be at a national level)?**

Currently, in the EEC (and nationally), there are only a few components of EV entrepreneurship ecosystem such as some EV charging operators, some EV users, and some manufacturers of vehicles which can potentially manufacture EVs. The existing entrepreneurship ecosystem is not complete and needs to be enhanced. The expected target for the entrepreneurship support program is to enhance the existing entrepreneurship ecosystem to be a complete and sustainable ecosystem and can be used as a model for replication in other regions/areas of the country. Relevant information has been added in the PIF.

**Will the project partner with key universities and research centers?**

As described under NSTDA's research projects, NSTDA as a key agency for implementing the entrepreneurship support program has already created partnerships with various universities and research centers when developing prototypes of various types of EVs.

**How are the GEF resources expected to be used in this output and what kind of co-financing can be expected?**

The GEF resources are expected to be used in this output to develop an entrepreneurship support program for various private sectors in the EEC including electric vehicle manufacturers, charging point operators, local public transportation fleet operators and drivers, to create a complete and sustainable ecosystem, and thus co-financing of various kinds from these various private sectors are expected. Relevant information has been added in the PIF.

#### **4. Is the project/program aligned with focal area and/or Impact Program strategies?**

**Secretariat Comment at PIF/Work Program Inclusion**

10/12/2020: Yes, the project is well aligned with the GEF CCM focal area strategy.

## Agency Response

### 5. Is the incremental / additional cost reasoning properly described as per the Guidelines provided in GEF/C.31/12?

#### Secretariat Comment at PIF/Work Program Inclusion

10/12/2020: Per the comments above, this and theory of change included could be further strengthened and be more specific.

Also, considering the focus on the EEC and the impact the new infrastructure project might have on GHG emissions in the area, the incremental reasoning of this project and its efforts to quantify the potential for GHG mitigation in the transport sector should be included. Will this project have an impact on these decisions?

10/16/2020: Incremental reasoning and theory of change has been strengthened. Comment cleared.

## Agency Response

10/14/2020

Theory of change has been updated as follows:

- Greater specificity on problems project aims to address, areas interventions are targeting, and assumptions and drivers connecting outputs and outcomes.
- Also greater specificity added in terms of how the project supports behavioural change / decision making of policy makers, the public and the private sector in terms of adopting and mainstreaming electric mobility.
- Strengthened linkages/pathway to mitigating GHG from transport sector.
- Reformatted for greater visual clarity on connections between each aspect.

Specificity has been also added to Incremental / additional cost reasoning table with linkages to barriers highlighted above:

- GEF funding is necessary to support systematic promotion of mutually reinforcing policy and institutional framework for EV and RE integration and EV adoption developed including addressing the existing gaps related to new products, production of EVs and testing facilities.

- The solar PV integrated charging infrastructure in the EEC will raise awareness on potential for EV-RE integration as a solution for mitigating GHG supporting the decarbonisation of the transport sector.
- Additionally, GEF funding is necessary to increased national technical capacity and knowledge developed with connections through national, regional and global programs and networks. Current knowledge and expertise of Thai industries in the areas of design and manufacturing of EVs is upgraded and prepares new skill labor for the EV industry.

**6. Are the project's/program's indicative targeted contributions to global environmental benefits (measured through core indicators) reasonable and achievable? Or for adaptation benefits?**

**Secretariat Comment at PIF/Work Program Inclusion**

10/12/2020: See comments above on Core Indicators.

**Agency Response**

10/14/2020

Section has been amended again as per comments under Core Indicators.

**7. Is there potential for innovation, sustainability and scaling up in this project?**

**Secretariat Comment at PIF/Work Program Inclusion**

10/12/2020: Yes, the project has strong potential for innovation, sustainability and scale up.

**Agency Response**

## **Project/Program Map and Coordinates**

**Is there a preliminary geo-reference to the project's/program's intended location?**

### **Secretariat Comment at PIF/Work Program Inclusion**

10/12/2020: Yes.

### **Agency Response**

## **Stakeholders**

**Does the PIF/PFD include indicative information on Stakeholders engagement to date? If not, is the justification provided appropriate? Does the PIF/PFD include information about the proposed means of future engagement?**

### **Secretariat Comment at PIF/Work Program Inclusion**

10/12/2020: CSOs and academia are missing from the stakeholders table. Please add.

10/16/2020: Additional relevant stakeholders have been added. Comment cleared.

### **Agency Response**

10/14/2020

CSO and academia have been added to the stakeholders table. Have also added Gender focal points and associations that promote GEEW

as stakeholders based on comments under Gender Equality and Women's Empowerment.

## **Gender Equality and Women's Empowerment**

**Is the articulation of gender context and indicative information on the importance and need to promote gender equality and the empowerment of women, adequate?**

### **Secretariat Comment at PIF/Work Program Inclusion**

10/12/2020: Please address the following:

- Please provide a summary of preliminary findings on gender-specific context of the project.
- While a thorough gender assessment will be carried out during PPG, additional thoughts on how the project can promote gender equality and empowerment of women in the project itself is needed. For example, in the projects outputs focused on entrepreneurship there could be an opportunity for this. Another area for additional consideration could be in the policy and institutional framework component to ensure the inclusion of gender-specific issues. Please elaborate on how the project will plan to incorporate any specific efforts.
- As Core Indicator 11 provides a gender disaggregated target, the results framework will include gender-sensitive indicator, there fore the answer to that question should be yes. Please change.

10/16/2020:

- Additional information has been provided on initial analysis of gender dimensions of the project both in terms of mobility and with regards to Thailand specifically. Comment cleared.
- A gender mainstreaming approach for the project, including plans for a gender analysis during the PPG have been detailed. Comment cleared.
- Selection has been fixed to "yes" on gender disaggregated targets. Comment cleared.

### **Agency Response**

- 10/14/2020
- Please provide a summary of preliminary findings on gender-specific context of the project.

Preliminary findings on gender-specific context of the project have been added to the PIF, and can be summarized as follows:

Thailand ranks 83 in the Gender Inequality Index 2017. However, Thailand has demonstrated its commitment towards gender equality within its assurances and ratifications at the international level. Thailand ratified the Convention on the Elimination of All Forms of Discrimination Against Women (CEDAW) in 1985 and its Optional Protocol in 2000, and has endorsed the Beijing Platform for Action (BPFA) and the Sustainable Development Goals (Gender Equality). Thailand has made significant efforts to integrate the international principles and instruments into its policy and programming framework as is evident within the Constitution B.E. 2550 (2007) which includes anti-sex discrimination and gender equality provisions. The Protection of Domestic Violence Victim Act was promulgated in 2007, and the penal codes and sex discriminated laws have been significantly revised. The Government of Thailand has made several efforts since 1972 to reduce discrimination against women within employment and improve skill development in various sectors (including agriculture), to enable them to earn better wages and become economically independent. There are also several social security and protection policies in place for all women to facilitate their employment in the labour market. There are special protection policies of women employed in the informal economy in Thailand.

Despite the above efforts, there are major challenges within the country that are blocking the road towards achieving gender equality. These include a lack of sex disaggregated data, traditional attitudes and gender related stereotypes that exist in the society. Such problems in Thailand are responsible for high rates of domestic violence against women, low rates of participation of women in politics and decision-making positions, discrimination against ethnic and rural women, prevalence of HIV, human trafficking and unsafe work environment within the informal sector (Hansatit, 2014). Traditionally, Thai women are concentrated in roles and relationships that invariably make them subordinate to men. There is a common saying in Thailand – *“women are the rear legs of an elephant”*, which means that men are the fore legs of the elephant and they are meant to take up leadership roles, while women are expected to follow and care for the husband and the family. A Time-Use Survey, conducted by UNDP (United Nations Development Programme) in 2015, for 65 countries demonstrate that in 2009, women in Thailand spent more time in care work more than men did.

To measure gender equality, one indicator is the share of women among legislators, senior officials and managers. In 2001, the ratio of men to women's employment in this category was 2.9, suggesting that men were three times more likely to be in this higher-quality or higher-skilled employment than women. The declining ratio in the later years indicated a decreasing gender gap, but the economic crisis in late 2008 hit female employment at this high level, and the ratio in 2008 shot up to 3.2 before gradually dropping to 2.7 in 2010 (Labour Force Survey, 2010).

- **While a thorough gender assessment will be carried out during PPG, additional thoughts on how the project can promote gender equality and empowerment of women in the project itself is needed. For example, in the projects outputs focused on entrepreneurship there could be an opportunity for this. Another area for additional consideration could be in the policy and institutional framework component to ensure the inclusion of gender-specific issues. Please elaborate on how the project will plan to incorporate any specific efforts.**

Gender mainstreaming approach for this project has been added to the PIF, and can be summarized as follows:

UNIDO acknowledge that the empowerment of women and gender equality have significant positive impacts on key drivers of poverty

UNIDO acknowledges that the empowerment of women and gender equality have significant positive impacts on key drivers of poverty alleviation and social progress, such as sustained economic growth and inclusive industrial development. UNIDO's mandate to promote inclusive and sustainable industrial development (ISID) relies on the advancement of gender equality and the empowerment of women.

UNIDO addresses gender inequalities in industry and harnesses women's full potential as economic agents of change and leaders thereby transforming economies and generating inclusive growth. One of the guiding principles of the project will be to ensure that both women and men are provided equal opportunities to lead, participate in, and benefit from the project (UNIDO Gender Policy 2019). The project has been developed considering the UNIDO guide on gender mainstreaming in energy and climate change projects.

In practical terms, gender mainstreaming will be demonstrated in a multitude of ways across the project:

- During PPG phase a Gender Analysis will be carried out and a gender mainstreaming action plan developed which will inform the project formulation. This will involve identification of the differentiated needs and roles of women and men as they relate to the project's interventions. In the project design UNIDO will ensure that the relevant gender dimensions are considered, and the project log-frame developed reflects key gender dimensions of the respective outputs, activities, indicators and targets. The gender analysis will identify how the project can improve gender equality and empower women, as well as propose gender specific targets to be monitored and evaluated throughout the project implementation period. Additionally, the PPG stage will be used to create relevant tools and methodologies for tracking gender issues throughout the project's implementation. To establish a baseline and develop targets, basic relevant data and qualitative information will be collected during PPG as part of the gender analysis and gender markers will be assigned in the project design.
- Budget will also be allocated based on the gender mainstreaming action plan, to ensure project implementation will promote GEEW, including collecting additional baseline data and monitoring progress towards the targets.
- Gender-responsive recruitment will be practiced at all levels, where possible, especially in the selection of project staff, researchers and experts, as well as technical staff. Gender sensitive recruitment will be encouraged in instances where the project does not have direct influence.
- Existing staff, project teams and stakeholders will be trained and their awareness raised on gender issues.
- Gender dimensions will be considered when data collections or assessments are conducted as part of project implementation. Examples include sex-disaggregated data collection and performing gender analysis during PPG.
- Gender dimensions will be considered in all decision-making processes. With respect to project management, the Project Steering Committee meetings will aim to be gender balanced and extend invitations to observers that represent gender dimensions, such as organizations / associations promoting gender equality and advocating women's empowerment. During project activity implementation, effort will be given during stakeholder consultations towards focusing on gender equality and women's empowerment issues, in particular during policy review and formulation.
- Research, data and assessments will consider gender and age differentiated needs of women and men from different social groups.

· Women's groups, associations that promote GEEW, gender focal points and stakeholders that work in the area of gender and mobility will be involved in the project, e.g. they will be consulted during PPG phase to verify the final project log frame is gender mainstreamed as well as PPG funds will be allocated towards having a review completed by specialized expertise. Possible partners could be Professor Benjamin Sovacool, Director of the Centre on Innovation and Energy Demand (CIED) at the University of Sussex and Johannes Kester from Aarhus University who did a study on who will buy electric vehicles and why.

- **As Core Indicator 11 provides a gender disaggregated target, the results framework will include gender-sensitive indicator, therefore the answer to that question should be yes. Please change.**

Indeed, the results framework does include gender-sensitive indicators and the answer has been adjusted to yes.

## **Private Sector Engagement**

### **Is the case made for private sector engagement consistent with the proposed approach?**

#### **Secretariat Comment at PIF/Work Program Inclusion**

10/12/2020: The project has a lot of opportunities for private sector engagement, only one of which is described in this section. Please elaborate on the other areas including the PPP aspect of the EEC, the focus on entrepreneurship, etc.

10/16/2020: Additional language on the different types of private sector engagement has been added. Comment cleared.

#### **Agency Response**

10/14/2020

As indicated in Table C of the PIF, there will be a lot of stakeholders from the private sector to be involved in this project, including, electric vehicle manufacturers, charging point operators, and local public transportation fleet operators and drivers. There can be also other private sector actors such as manufacturers/sellers/recyclers of batteries for EVs, garage owners, private banks and/or financial institutions, owners of private land for potential charging stations, and etc. Thus, there will be a lot of opportunities for private sector engagement. With FFCO and Ravenna Municipality and other organizations such as TAI and EVAT as partners in the project which know and have collaboration



EEC and Nongovernmental and other organizations such as TRA and EVTA as partners in the project, which know and have collaboration with the private sector in the EV industry, especially in the EEC area, the project will identify and engage right private sector stakeholders.

As a key output of the project, the project will develop an entrepreneurship support program for electric mobility solutions to enhance the business sector ecosystem for entrepreneurship. As also explained earlier in response to GEF Secretariat's question on the expected target of the entrepreneurship's support program, there are currently only a few components of EV entrepreneurship ecosystem in the EEC such as some EV charging operators, some EV users, and some manufacturers of vehicles which can potentially manufacture EVs. The existing entrepreneurship ecosystem is not complete and sustainable and needs to be enhanced. The project will engage and support various potential private sector stakeholders as mentioned above in order to enhance components of the existing entrepreneurship ecosystem to be a more complete and sustainable ecosystem which can be used as a model for replication in other regions/areas of the country. In order to financially support relevant private sector stakeholders for related investment required in the project such as for the establishment of charging infrastructure integrated with renewable energy systems, the purchase of electric vehicles, and the establishment of battery recycling stations for second life applications, the project will also engage banks and/or financial institutions, including private banks/financial institutions. For some related investment required in the project, a collaboration between the public and private sector in the form of public and private sector partnerships (PPP) will also be explored. For instance, in order to expand charging infrastructure throughout the EEC area, land of the public sector may also be used for private investment in the establishment of charging infrastructure. A PPP of granting of concessions by local administrative organization for private operators of local public transportation using EVs in routes within the EEC can also be explored.

This language has been added to the private sector engagement section within the PIF.

## **Risks to Achieving Project Objectives**

**Does the project/program consider potential major risks, including the consequences of climate change, that might prevent the project objectives from being achieved or may be resulting from project/program implementation, and propose measures that address these risks to be further developed during the project design?**

### **Secretariat Comment at PIF/Work Program Inclusion**

10/12/2020: Please provide additional details on how the project may be impacted by COVID-19 and the project's consideration to these risks for all aspects of project design and eventual implementation. Please also add information related to the potential contribution of this project to Thailand's green recovery.

In addition, climate risks are not sufficiently described and assessed. Please see STAP guidance on climate risk screening ([link below](#)) and provide at least a basic climate risk screening at PIF stage. At a minimum, at PIF stage, the climate risks should be identified, listed and

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described. This can include:

- a.) Outlining the key aspects of the climate change projections/scenarios at the project location (or as close to it with data available), which are relevant for the type of intervention being financed (e.g. changes in temperatures, rainfalls, increased flooding, sea level rise, saltwater aquifer contamination, increased soil erosion, etc).
- b.) Time horizon if feasible/data available (e.g. up to 2050). Please refer to list of examples from STAP guidance.
- c.) Listing key potential hazards for the project that are related to the aspects of the climate scenarios listed above (describe how the climate scenarios identified above are likely to affect the project, during 2020-2050).
- d.) Describing plans for climate change risk assessment and mitigation measures during PPG.

(<https://stapgef.org/sites/default/files/publications/Climate%20Risk%20Screening%20web%20posting.pdf>)

10/16/2020: Additional information on the risks and mitigation strategies related to the COVID-19 pandemic and climate change impacts has been added and will be further detailed during PPG. Comments cleared.

## Agency Response

10/14/2020

### COVID-19 Pandemic:

The project faces a variety of potential risks due to the COVID-19 pandemic. First, general trends in people's transportation preferences in response to COVID-19 could pose challenges to the project's objectives of increasing adoption rates of electric mobility and the project's implementation. The demonstration and awareness raising linked to the adoption of electric public transportation could be hindered due to less interest in public transportation from the public, in turn creating challenges for the viability of the business model. Additionally, if people are nudged by the pandemic towards private transport, the high upfront purchase costs for electric vehicles for private use could push people towards purchasing vehicles with internal combustion engines. Additionally, the reduction in car sales could lower interest in private sector investment for EVs – indeed, an assessment by Deloitte of the Thai industry recovery timeframes anticipates the automotive sector is not expected to rebound in Thailand until 2022.

To mitigate this risk, the project will create linkages with international and national green recovery packages to build back the market towards electric mobility. To date and of relevance, Thailand has already released a suite of COVID-19 recovery measures including soft loans of THB 500 billion to SMEs through commercial banks and 6 month loan payment holidays. During PPG, the project will discuss with stakeholders additional opportunities to align the project with recovery measures.

The project will likely also face practical challenges in terms of delays due to potential restrictions in the movement of people and goods.

Stakeholder consultations and site screening for technology demonstrations could be delayed as well as any needs for addressing maintenance or service issues after installation due to movement restrictions. To address these challenges, the project will build into its

work plan a certain amount of consideration for potential delays as well as flexibility in terms of planning the potential need to conduct capacity building and stakeholder engagement through online approaches.

Preliminary climate risk assessment:

Thailand is located in the southeastern part of the Asian mainland, in a tropical region with a relatively warm year-round temperature. Thailand is vulnerable to many natural and human-induced hazards, including floods, droughts, tsunamis, forest fires and landslides (World Bank Climate Change Knowledge Portal). In particular, hydrological events and drought are common and have had fatal consequence – notably during the 2004 Indian Ocean earthquake and tsunami which resulted in over 200,000 fatalities. Thailand's greatest risk are floods and droughts and to a lesser extent, cyclones, specifically in the northern portion of the country. Climate change has already had an impact on the frequency and severity of hazards. In 2020, the Global Climate Risk Index ranked Thailand as the 8<sup>th</sup> most affected country by climate change for the period of 1999 to 2008.

Using the Coupled Model Intercomparison Project Phase 5 (CMIP5) models included under the IPCC's Fifth Assessment Report (AR5), key projected climate trends for Thailand include a mean annual temperature increase of 1.4 to 1.8°C by the 2060's and 3.0 to 3.8 °C by the 2090's. Projections for mean annual rainfall across different model's project changes in precipitation between +28% to 74% by 2090. The Thai Office of Natural Resources and Environmental Policy and Planning estimates that sea levels will rise one meter over the next 40 to 100 years, impacting at least 3,200 km<sup>2</sup> of the country's coastal land, and affecting 17% of Thailand's population.

The rise in global temperature is anticipated to contribute to an increase in storms and in turn, flooding, in particular on coastlines along the Gulf of Thailand. Climate change is also projected to contribute to increased levels of drought, with some areas projected to have lower overall annual rainfall but also experience a higher frequency of storms.

The Eastern Economic Corridor, which includes the provinces of Chachoengsao, Chonburi and Rayong and is the region selected for the project's technology demonstrations, is located in the central eastern part of the country along the Gulf of Thailand. People and infrastructure along the region's coastlines have exposure to hazards such as flooding and storms that could potentially intensify during the course of the project and its outcomes lifetime. However, these risks will be managed by completing a climate risk assessment during PPG and incorporating its findings into the design of the project. Specifically, the project will mitigate any potential risk by selecting appropriate project sites that have minimal exposure to the identified hazards. With these measures in place, and given the unlikelihood that the project would be negatively impacted by the above risks, the project's climate change risk has been assessed as low.

This language has been under the "Risks to achieving project objectives" section.

## Coordination

**Is the institutional arrangement for project/program coordination including management, monitoring and evaluation outlined?  
Is there a description of possible coordination with relevant GEF-financed projects/programs and other bilateral/multilateral initiatives in the project/program area?**

**Secretariat Comment at PIF/Work Program Inclusion**

10/12/2020: Please consider adding information on how the project may coordinate with the GIZ TRANSfer III project which seems to have relevance to this project.

10/16/2020: Further exploration of coordination with the GIZ project will be carried out during PPG. Comment cleared.

**Agency Response**

10/14/2020

The GIZ project supports the Thai government in the design and the creation of Thai Clean Mobility Program (TCMP). TCMP is a national program that supports city administrations in their efforts to plan and implement Sustainable Urban Transport Projects, thereby reducing GHG emissions and air pollution stemming from transport in Thai cities. The GIZ project includes setting up a national Sustainable Urban Transport (SUT) Fund to finance SUT projects in other Thai cities.

The proposed project will coordinate with the GIZ project regarding the National SUT Fund to finance SUT projects in the EEC to complement the proposed project, as well as to share experiences and lessons learned from the proposed project with the GIZ project in order to use the Fund to support scale-up and replication of electric mobility in other cities in Thailand, if applicable. The potential for collaboration with the GIZ project can be further explored during the PPG phase, when there are more results and outputs of the GIZ project that are relevant to the proposed project.

This language has been added to the "Coordination" section.

**Consistency with National Priorities**

**Has the project/program cited alignment with any of the recipient country's national strategies and plans or reports and assessments under relevant conventions?**

**Secretariat Comment at PIF/Work Program Inclusion**

10/12/2020: Yes, this project is aligned with national priorities and Thailand's NDC.

**Agency Response**

**Knowledge Management**

**Is the proposed “knowledge management (KM) approach” in line with GEF requirements to foster learning and sharing from relevant projects/programs, initiatives and evaluations; and contribute to the project’s/program’s overall impact and sustainability?**

**Secretariat Comment at PIF/Work Program Inclusion**

10/12/2020: Yes the KM approach is in line with the GEF requirements. In particular, this project will link with the ongoing GEF Global Program on E-Mobility being led by UNEP.

**Agency Response**

**Environmental and Social Safeguard (ESS)**

**Are environmental and social risks, impacts and management measures adequately documented at this stage and consistent with requirements set out in SD/PL/03?**

#### **Secretariat Comment at PIF/Work Program Inclusion**

10/12/2020: Yes, a preliminary ESS screening has been included and the project has been found to have medium risks at this stage with impacts that are likely to be few in number and site-specific.

#### **Agency Response**

#### **art III – Country Endorsements**

**Has the project/program been endorsed by the country's GEF Operational Focal Point and has the name and position been checked against the GEF data base?**

#### **Secretariat Comment at PIF/Work Program Inclusion**

10/12/2020: Yes, Mr. Jatuporn Buruspat has endorsed the project.

#### **Agency Response**

#### **Termsheet, reflow table and agency capacity in NGI Projects**

**Does the project provide sufficient detail in Annex A (indicative termsheet) to take a decision on the following selection criteria: co-financing ratios, financial terms and conditions, and financial additionality? If not, please provide comments. Does the project provide a detailed reflow table in Annex B to assess the project capacity of generating reflows? If not, please provide comments. After reading the questionnaire in Annex C, is the Partner Agency eligible to administer concessional finance? If not, please provide comments.**

#### **Secretariat Comment at PIF/Work Program Inclusion**

N/A

## Agency Response

## EFSEC DECISION

## RECOMMENDATION

**Is the PIF/PFD recommended for technical clearance? Is the PPG (if requested) being recommended for clearance?**

### Secretariat Comment at PIF/Work Program Inclusion

10/12/2020: Please address all comments.

19/16/2020: All comments above have been addressed. PM recommends PIF and PPG technical clearance.

## ADDITIONAL COMMENTS

**Additional recommendations to be considered by Agency at the time of CEO endorsement/approval.**

### Secretariat Comment at PIF/Work Program Inclusion

10/16/2020: Based on the PIF review comments above, please consider below comments during project design:

-Co-financing and private sector participation - As mentioned above, the materialization of the expected co-financing will be key to the success of the project, and we hope to potentially see additional co-financing to support wider scale up of public electric mobility and/or alternate investment opportunities considering the many areas of private sector engagement in the project.

-Impact of EEC development - Considering the focus of the project on the EEC, by CEO endorsement we would like to see an assessment of the potential impact on GHG emissions from the different relevant infrastructure development plans in the EEC and how the project will help inform these through its focus on national policy and institutional framework and GHG reduction plans in the transport sector to ensure a

sustainable low-carbon development of the region and thus support Thailand's decarbonization efforts.

-Coordination - By CEO endorsement we expect to see concrete plans for coordination with the Global E-mobility program, including through linkage to relevant working groups and the regional hub.

-Gender - By CEO endorsement, as a result of the gender analysis, we hope to see some concrete activities in which the gender dimension is incorporated in the project beyond project implementation arrangements to support the promotion of gender equality and empowerment of women.

-Climate risk - By CEO endorsement, we expect to see how climate change impact considerations have been incorporated in the design of the project. While the climate risk has for now been assessed as low, it is important to mainstream the risks that climate change may have on the project throughout the different outputs. For example, what will be the potential impact of electric mobility on the grid in a future of higher energy demand due to increased temperatures? Will renewable energy output (i.e. solar PV powered charging stations) be impacted by climate changes? How will resilience to climate change impacts be embedded to investments made by the project?, etc.

## Review Dates

	PIF Review	Agency Response
First Review	10/12/2020	
Additional Review (as necessary)	10/16/2020	
Additional Review (as necessary)		
Additional Review (as necessary)		
Additional Review (as necessary)		

## PIF Recommendation to CEO

## Brief reasoning for recommendations to CEO for PIF Approval



According to 2013 data, 74% of the total GHG emissions came from the energy sector, of which energy use in the transportation sector accounted for around 26%. Thailand's NDC Roadmap on Mitigation 2021-2030, approved by the cabinet in May 2017, included GHG reduction measures in three sectors, i.e., the energy and transportation sector, the industrial process and product use sector, and the waste management sector. With regards to the transportation sector, the NDC Roadmap states a mitigation target of 41 MtCO<sub>2</sub>e. The Thai government has also been implementing a Master Plan for Sustainable Transport System and Mitigation of Climate Change Impacts.

Despite its potential and relative government support, significant challenges remain to be addressed in the transportation sector. This climate change mitigation project aims to address barriers to the adoption and scale-up of electric mobility in Thailand through enhancing the policy and institutional framework and technology demonstrations in Thailand's Eastern Economic Corridor (EEC).

The project consists of 4 components:

Component 1: Improve national policy and institutional framework for electric mobility and sustainable use of batteries

Component 2: Accelerate technology adoption of electric mobility and sustainable use of batteries

Component 3: Capacity building, up-scale and knowledge sharing

Component 4: Monitoring and Evaluation

The project will target policy and institutional frameworks to address barriers on both the demand and supply sides, and to address life cycle issues of electric mobility and sustainable use of batteries. It will pilot demonstrations of the use of EVs and charging infrastructure integrated with renewable energy systems and of sustainable use of batteries within the EEC. The project will also aim to enhance a business sector ecosystem for EV entrepreneurship within the EEC and Thailand and to support the integration of circular economy practices into the life cycle of batteries.

The project aims to mitigate 351,164 tCO<sub>2</sub>e and 1,755,820 tCO<sub>2</sub>e of direct and indirect GHG emissions, respectively, over 10 years. The project is targeting \$19,684,900 in co-financing, of which over \$14,000,000 will be investment mobilized.