

**Minutes of Meeting**  
**the 1<sup>st</sup> meeting of the Technical Working Group for Eco-industrial Development under**  
**Application of industry-urban symbiosis and green chemistry for low emission and**  
**persistent organic pollutants free industrial development in Thailand project**  
**Held on 8 February 2021**  
**At meeting room M 1 - 2, 23<sup>rd</sup> floor, Centara Grand at Central World, Bangkok**

**Members Present:**

- |    |  |                                  |
|----|--|----------------------------------|
| 1. | Mr. Verakit Rantakittanawat, Deputy Director General,<br>Department of Industrial Works  | Chairperson                      |
| 2. | Ms. Nopalak Supatanasinkasem, Scientist, Expert level,<br>Department of Industrial Works   | Committee                        |
| 3. | Ms Teeraporn Wiriwutikorn, Director of Waste and Hazardous<br>Substance Management Bureau, Pollution Control Department            | Committee                        |
| 4. | Ms. Duangporn Khunthong, Director of Eco Industrial Town<br>Development Division, Industrial Estate Authority of Thailand          | Committee                        |
| 5. | Ms. Panrat Phechpakdee, Senior Director of Water and<br>Environment Institute for Sustainability, Federation of Thai<br>Industries | Committee                        |
| 6. | Mr. Chanin Panjapornpon, Associate Professor,<br>Kasetsart University  | Committee                        |
| 7. | Ms. Uma Wirutskulshai, National Project Coordinator,<br>United Nations Industrial Development Organization                         | Committee and<br>Joint Secretary |
| 8. | Ms. Ampaiwan Jairungsee, Director of Eco Industrial Town<br>Development Group, Department of Industrial Works                      | Committee and<br>Joint Secretary |

**Absent (according to other business):**

- |    |  |                                  |
|----|--|----------------------------------|
| 1. | Mr. Nattaphongs Julagatepotichai, Director of Eco Industrial<br>Development Division, Department of Industrial Works | Committee and<br>Joint Secretary |
|----|--|----------------------------------|

**Observers:**

- |    |                             |   |
|----|-----------------------------|---|
| 1. | Mr. Amnart Taolek           | Department of Industrial Works                        |
| 2. | Ms. Salakjit Wutanusorn     | Department of Industrial Works                        |
| 3. | Mr. Pipat Chettapinit       | Department of Industrial Works                        |
| 4. | Ms. Sawanya Charimit        | Department of Industrial Works                        |
| 5. | Mr. Pongtheb Jaruampornparn | Federation of Thai Industries                         |
| 6. | Ms. Patrandha Sangmahamad   | Federation of Thai Industries                         |
| 7. | Ms. Viganda Varabuntoonvit  | Kasetsart University                                  |
| 8. | Ms. Kritiya Kaspanich       | United Nations Industrial<br>Development Organization |

In overall, there were 16 participants; 5 male and 11 females. The chairperson of the first meeting of the Technical Working Group for Eco-industrial Development (1<sup>st</sup>/2021) under the project “Application of industry-urban symbiosis and green chemistry for low emission and persistent organic pollutants free industrial development in Thailand” is Mr. Verakit Rantakittanawat.

**The meeting started at 13.00 hrs.**

**Agenda item 1: Chair's Announcement**

Mr. Verakit Rantakittanawat greeted the participants and welcomed to the first meeting of the Technical Working Group for Eco-industrial Development (1<sup>st</sup>/2021) under Application of industry-urban symbiosis and green chemistry for low emission and persistent organic pollutants free industrial development in Thailand project. He invited the Technical Working Group (TWG) members to introduce themselves. In addition, he announced the following topics on Meeting's Agenda:

**1.1 Order of the Project Steering Committee No. 212/2563 Re: Appointment of Technical Working Group: TWG**

Mr. Verakit Rantakittanawat presented the Order of the Project Steering Committee No. 212/2563 Re: Appointment of Technical Working Group: TWG, its composition, duties/responsibilities and authority to act.:

**The composition of TWG members**

- |  |                               |
|--|-------------------------------|
| 1. Deputy Director General, Department of Industrial Works       | Chairperson                   |
| 2. Representative of the Department of Industrial Works          | Committee                     |
| 3. Representative of the Pollution Control Department            | Committee                     |
| 4. Representative of the Industrial Estate Authority of Thailand | Committee                     |
| 5. Representative of the Federation of Thai Industries           | Committee                     |
| 6. Representative of Kasetsart University                        | Committee                     |
| 7. Director of Eco-industrial Development Division               | Committee and Joint Secretary |
| 8. National Project Coordinator                                  | Committee and Joint Secretary |
| 9. Director of Eco-industrial Town Development Group             | Committee and Joint Secretary |

**As part of TWG, the member would have the following duties/responsibilities:**

1. Consider and approve Term of Reference (ToR) for recruiting national contractors in related work.
2. Monitor and evaluate the performance of contractors in related fields.
3. Provide technical advice to the Project Management Unit (PMU).
4. Appoint sub-working groups to supervise and monitor the operation of assigned task.
5. Carry out additional tasks as delegated by the Project Steering Committee.

## **Agenda item 2: Reports**

### **2.1 Overview of the Eco-industrial Development Program Implementation**

Ms. Uma Wirutskulshai presented the overview of the Eco-industrial Development related activities under the project. The project has received a five-year support contribution of \$8.966 million USD from the Global Environment Facility (GEF). Project's implementation started in July 2019 and should be completed in 2025. The Department of Industrial Works (DIW), the Pollution Control Department, the Industrial Estate Authority of Thailand, the Federation of Thai Industries, and Kasetsart University are the key project partners, the United Nations Industrial Development Organization (UNIDO) plays the role of GEF Implementing Agency. The project aims to reduce greenhouse gas emissions (Greenhouse Gas: GHG) by 1.3 million tons of carbon dioxide equivalent (CO<sub>2</sub>eq). In addition, project's targets are to reduce the use of persistent organic pollutants (POPs) from the industrial sector in the amount of 620 tons in 3 targeted Thai Provinces: Samut Prakan, Rayong and Chonburi.

The main activities in the project consist of policy development and supporting of Material Flow Analysis (MFA), online waste database, capacity building, factory audit and pilot project(s), and establishing a national eco-industrial town framework. The project concept is to achieve resource efficiency via industry-urban symbiosis, which is related to Eco-industrial Town Development that was implemented by the Department of Industrial Works.

Project's outputs and outcome are strictly related to the following four Sustainable Development Goals (SDGs):

- SDG Target 7.3: Double the global rate of improvement in energy efficiency
- Target 8.4: Improve resource efficiency in consumption and production
- Target 9.4: Upgrade all industries and infrastructures for sustainability
- Target 12.4: Achieve the environmentally sound management of chemicals and all wastes throughout their life cycle

Previously, project partners drove the development of eco-industries during the project's implementation. However, the mobilization is not harmonized. As a result, the project aims to promote greater integration and cooperation, as well as to incorporate mobilizing mechanisms through the following project's activities:

- Arrangement of seminar and training
- Providing an online training platform
- Establishment of a national eco-industrial development framework
- Development of supporting systems for the national eco-industrial development framework
- A demonstration project to implement the national eco-industrial development framework
- Policy and planning to drive eco-industrial development
- Auditing of Resource Efficient and Cleaner Production (RECP) through Eco-factory and RECP demonstration projects
- Identifying opportunities in the symbiosis with MFA

- Identifying and piloting business models for opportunities in symbiosis
- Pilot online waste exchange database to support symbiosis and circular economy

### **Conclusion and suggestions from point 2.1**

The meeting members acknowledged the overview of the related activities of Eco-industrial Development Implementation.

### **2.2. Procurement Process**

Ms. Uma Wirutskulshai presented the procurement process as follow:

1. TWG approves the draft ToR and lists of potential contractors.
  - The draft ToR for TWG's consideration will be in both English and Thai versions
  - The draft ToR for bidding processes handled by UNIDO Procurement Unit will be drafted in English
  - UNIDO Procurement Unit would notify by e-mail the potential bidders (list of potential contractors proposed by TWG committee).
- In addition, all procurement tenders/bidding are accessible to the UNIDO website (<https://www.unido.org/resources-procurement/procurement-opportunities>)
2. Bidding announcement handled by UNIDO Headquarters
  - UNIDO Headquarters would launch the bidding process on the website and notify by email the potential contractors/
  - Bidders shall submit their proposals (technical and commercial) and all required supporting documents through the UNIDO SAP system.
  - UNIDO Procurement Unit would verify the authenticity of the document.
  - UNIDO Procurement Unit work in close cooperation with project management team. The technical evaluation of offers is performed by the project manager team, the Procurement Unit makes the necessary assessment on the bidders/offers from a procurement point of view (financial liability, etc.)
3. Technical evaluation
  - TWG members will be strictly involved in the evaluation of the technical proposals, in collaboration with UNIDO (all members taking part to the evaluation shall sign a UNIDO Declaration of Objectivity, Impartiality and Confidentiality.
    - Members of TWG will sign the Declaration of objectivity, impartiality and confidentiality bound by the Standards of Conduct for the International Civil Service, UNIDO's Code of Ethical Conduct, the UNIDO Staff Regulations and Rules and related administrative issuances.
    - PMU would gather technical evaluation results and submit to UNIDO Procurement Unit.

#### 4. Bidding and negotiation process.

- The UNIDO Procurement Unit would consider only the financial proposal of the contractor who passes the technical evaluation.
- The contractor, who passes the technical evaluation with the lowest and reasonable cost would be the first priority for negotiation.

#### 5. Agreement signing process

- UNIDO Procurement Unit would be responsible of all contractual content and clauses.
- The contract would be initiated once the signing and documentation are completed. (See attached 2.2)

### **Conclusion and suggestions from point 2.2**

The meeting members acknowledged the procurement process.

### **Agenda item 3: Matters to be considered**

#### **3.1 ToR of Policy development and recommendation to support the RECP implementation and promotion and list of contractors proposed by TWG committee.**

Miss Uma Wirutskulshai presented the ToR of Policy development and recommendation to support the RECP implementation and promotion. There were 4 topics: 1) The details of ToR, 2) Project duration (15 months or 18 months), 3) Participants to evaluate the technical proposal (TWG or representatives), and 4) List of institute/company to be invited. (See attached 3.1)

### **Conclusion and suggestions from point 3.1**

#### 1. Review additional information and government policies as follows:

- Bio Economy, Circular Economy, and Green Economy
- Resource Efficient and Cleaner Production (RECP) along with Eco Industrial Town
- European Conformity (CE)

2. Prepare an overview of the relationship between the SDGs, the national policy, the Master Plan, the Ministry's strategy, Department Strategy, and Division Strategy up to the project's level.

3. The in-depth interview with the management who has an experience on driving the eco-industrial development at various levels: national level, community level, stakeholder level.

4. The National Savings Fund (NSF) should be invited to the stakeholder meeting.

5. Greening industry (GI) should be included in the ToR of Policy Formulation and Recommendations to Promote RECP Adoption and Promotion).

6. The tools for analysis and policy development should be specified.

7. The pre/post-implementation should be evaluated. Also, Eco Factory, Eco Factory Plus Social Value (Eco Factory +SV), and risk assessment should be included in this ToR of Policy development and recommendation to support the RECP implementation and promotion.

8. Add one more hearing meeting (approximately 30 participants). Therefore, the total of hearing meeting would be six times that would have 200 people.

9. Vigilant measures against the spread of COVID-19 should be included in the ToR.
10. The implementation period of this activity will be 15 months.
11. The members of TWG will took part to the technical evaluation.
10. The following companies/institutes should be invited to submit the technical proposals:
  - United Analyst and Engineering Consultant (UAE)
  - Center of Excellence on Hazardous Substance Management, Chulalongkorn University
  - NPC Safety and Environmental Service Co.,Ltd.
  - Thai Environmental Technic Limited
  - CMS Engineering & Management Co.,Ltd. (CMS)
  - Management System Certification Institute (Thailand) (MASCI)
  - Thai Environmental Technic Limited (TET)
  - Thailand Development Research Institute (TDRI)

### **3.2 ToR of provision of the establishment of National Eco-industrial Development Framework**

Ms. Uma Wirutskulshai presented the ToR of the establishment of National Eco-industrial Development Framework. There were 4 topics: 1) The details of ToR, 2) Project duration (15 months or 18 months), 3) Participants to evaluate the technical proposal (TWG or representatives), and 4) List of institute/company to be invited. (See attached 3.2)

#### **Conclusion and suggestions from point 3.2**

1. The meeting proposed that the focus group should be arranged two times.
2. The processing/demonstration of the information to linkage to eco-industrial town and SDGs. Also, risk assessment should be added into ToR of the establishment of National Eco-industrial Development Framework.
3. The meeting proposed to do the work instruction of implementing the Eco-Industrial Town criteria or Eco-Industrial Park criteria in each area.
4. Added to one more hearing meeting for stakeholders/experts.
5. Item 6.1 should be modified to “upgrading the National Eco-industrial Development Framework to be a National/International Standard”
6. The time schedules would be 15 months. The payments ‘schedule for contractor was be separated into five months, ten months, and fifteen months. (
7. The companies/institutes should be invited to submit the technical proposals:
  - United Analyst and Engineering Consultant (UAE)
  - King Mongkut's University of Technology North Bangkok (KMUTNB)
  - Management System Certification Institute (Thailand) (MASCI)
  - Thai Environmental Technic Limited (TEI)
  - NPC Safety and Environmental Service Co.,Ltd. (NPC S&E)
  - VGREEN

- Chiang Mai University (CMU)
- Excellence Center of Eco-Energy Chemical Engineering, TU (ECEE TU)
- National Institute of Development Administration (NIDA)
- Economic Research and Training Center (ERTC)

### 3.3 RECP assessments

Mr. Pongtheb Jaruampornparn presented the RECP assessment plan. There were three target areas: Rayong, Chonburi, and Samut Prakarn province.

The RECP assessment was divided into two parts, as follows:

#### 1. Framework for enhancing resource efficiency, chemical, energy, and industrial waste

- Consulting and evaluating RECP issues for factories (4 man-days per factory) with a target of 200 factories in 3 provinces: Rayong, Samut Prakan, and Chon Buri to assess development opportunities in RECP by using the Eco Factory indicator tool to evaluate and recommend improvements/upgrades of the factory.
- Study on technical and financial suitability (9 man-days / project) This includes the on-desk duration of the consultant) with a goal of 100 projects selected from 200 factories to produce a report on the technical and financial suitability of the selected projects.
- Encourage implementation of measures or results of studies (4-8 Man-days/project), targeting 50 projects selected from 100 projects to assess the effect of quantitative savings, reduce greenhouse gas emissions, and promote Eco Factory, Green Industry certification.

\* The operations would be divided into three periods of 10-12 months each, and there are 67-70 factories in each period.

#### 2. To conduct audits to promote resource efficient

- Criteria for selecting factories to be audited
- Schedule of on-site advice to assess development opportunities for Resource Efficient and Cleaner Production: RECP (4 Man-days/factory).
- Factory audit checklist According to the eco-factory criteria, which were divided into seven areas, including
  1. Raw Material Usage
  2. Energy management
  3. Water and Waste water management
  4. Air Pollution Control
  5. GHG emission management
  6. Waste management
  7. Chemical management

Status of factories: 84 factories participating in the project, with 200 target factories that were audited for the target RECP in the first phase, 67 factories (see attached 3.3)

### **Conclusion and suggestions from point 3.3**

1. The Eco Industrial Development Division had been tasked with submitting a list of factories and factory entrance data tables, as well as notifying Industrial Permit Services Divisions 1 and 2. However, Mr. Verakit Rantakittanawat requested to participate approximately 2 times.

2. For the training, FTI would coordinate through the Eco Industrial Development Division and other divisions to further participate.

### **Agenda item 4: Other (if any)**

#### **4.1 Seminar based on the eco-industrial town implementation direction according to Thailand's 20-Year National Strategy**

Request for the permission arrangement of the seminar based on the eco-industrial town implementation direction according to Thailand's 20-Year National Strategy was held on February 25, 2021, at the Sukosol Hotel in Bangkok. The target group consists of at least 50 government employees involved in eco-industrial town development.

### **Conclusion and suggestions from point 4.1**

The TWG agreed to hold a seminar based on eco-industrial town implementation direction according to Thailand's 20-Year National Strategy on February 25, 2021, at the Sukosol Hotel in Bangkok.

#### **4.2 Actions supporting studied to reduce GHG greenhouse gas emissions**

### **Conclusion and suggestions from point 4.2**

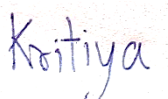
Additional studies should be conducted to determine the overall productivity of the existing industrial sector at the national level, beginning with three provinces: Rayong, Chonburi, and Samutprakarn Province. Then, over the next five years, design a plan to reduce GHG emissions. Furthermore, GHG emissions are an indicator that is part of the UN SDGs. As a result, it may be used to measure the industry's performance.

#### **4.3 The development of personnel**

### **Conclusion and suggestions from point 4.3**

The TWG proposed that personnel in both parts of the Department of Industrial Works and Provincial Industry Office, including the industries involved in GHG reduction, should be developed skills/knowledge to raise awareness of GHG problems and enhance the learning of the relevant officers.

**The meeting was closed at 4:40 p.m.**



**(Ms.Kritiya Kaspanich)**

**Working group and Joint Secretary**

**Minutes taker**

**(Ms.Uma Wirutskulshai)**

**Committee and Joint Secretary**

**Minutes Inspector**