

Minutes of meeting

To introduce the OPTOCE project and to discuss with the participants on possible scope and timeline of activities in Thailand.

Asian Institute of Technology, Khlong Luang District, Thailand
 10 September 2019 13:00-16:00 hrs

INITIATED BY	WRITTEN BY	PRESENT	ABSENT	FOR YOUR INFORMATION
Kåre Helge Karstensen	Palash Kumar Saha			
DISTRIBUTION				
Mr. Taweechai Jiaranaikhajorn, Director- MSW Management, PCD			x	
Mr. Paradorn Chulajata, Chairman, Plastic Industry Club, FTI		x		
Ms Vanessa Carriedo, Regional Communications Officer, IUCN, Bangkok		x		
Ms Orathai Ponaruktham (Nok), Thailand Env. Institute (TEI), Bangkok		x		
Prof. Dr. Chongrak Polprasert, Thammasat School of Engineering		x		
Prof. Dr. C Visvanathan, School of Env., Resources and Dev., AIT		x		
Prof. Dr. Thammarat Kottatep, School of Env., Resources and Dev., AIT		x		
Dr. Vincent Aloysius, CEO, Ecocycle		x		
Ms Piyachat Chairoon, Communications Manager, Ecocycle		x		
Mr. Boonchai Pongnaravan, RDF lead, Ecocycle		x		
Ms Paranee Jansawake (Grace), Royal Norwegian Embassy, Bangkok		x	x	
Dr. Kåre Helge Karstensen, Chief Scientist, SINTEF		x		
Mr. Palash Kumar Saha, Research Scientist, SINTEF		x		
Mr. Eirik L Vigerust, Research Scientist, SINTEF				x
Ms Anneli Alatalo Paulsen, Research Scientist, SINTEF				x
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QZA-0835 RAS-18/0027 SINTEF102019800-1	2019-09-17	Unrestricted		

Agenda

Time	Activity	Presenter
13.00-13.05	Welcome and Opening remarks	Dr Kåre Helge Karstensen, Chief Scientist, SINTEF
13.05-13.10	Quick Round the table introduction of the participants	All
13.10-13.30	Presentation of the OPTOCE project <ul style="list-style-type: none"> - Role of the Task Force - Planned activities & timeline - Expected outcomes 	Dr Kåre Helge Karstensen, Chief Scientist, SINTEF
13.30 – 14.00	Reflections	All
14.00-14.15	Plastic waste in Thai dumpsites	Prof. Dr. C Visvanathan, Asian Institute of Technology (AIT)
14.15-14.30	Experiences from INSEE Ecocycle on landfill mining	Dr. Vincent Aloysius, CEO INSEE Ecocycle
14.30-14.45	Status of plastic waste in Thailand Where are we now, and where are we going	Mr. Taweechai Jiaranaikhajorn, Director of the Municipal Solid Waste Management Sub-division at PCD (not presented)
14.45-15.00	Plastic Industry Club What they do and their work with plastic waste	Mr. Paradorn Chulajata, Chairman of FTI Plastic Industry Club
15.00-15-15	Coffee break	
15.15-15.50	Discussion with participants: scope and timeline of OPTOCE Thailand activity	All
15.50-16.00	Closing remarks Summary of the day and way forward	Dr Kåre Helge Karstensen, Chief Scientist, SINTEF

Minutes of meeting

- Dr. Kåre Helge Karstensen, Chief Scientist- SINTEF and Programme Manager of the OPTOCE project, gave the opening remarks on the purpose of the inception meeting. The participants introduced themselves.
- Dr. Karstensen gave an introductory presentation on the OPTOCE project with a brief update on the activities and possible pilot demonstration sites in partner countries in China, India, Vietnam, Myanmar, and Thailand.
- In Thailand, the OPTOCE the project will work on plastic waste reclamation from dumpsites, evaluate the performance with a focus on quantifying waste collection, marine pollution avoidance potential, impact on the landfill/dumpsite lifetime and related socio-environment-economic benefits.
- Prof. Visvanathan (Visu) presented the studies conducted by AIT (Master Thesis) in estimating the quality and quantity of plastic wastes lying in dumpsites and landfills in Thailand and potential recovery of plastic wastes in energy-intensive industries.
- Thailand produces 25.24 Mt of solid wastes- 77% is currently mismanaged. The estimated share of plastic wastes in raw MSW is 18% and in dumpsites is 42%. After China banned the plastic waste import, the influx of wastes to Thailand has gone up substantially; approaching 0.6 million tonnes in 2018.
- The AIT study was conducted in two dumping sites (Nakhon Nayok and Nong-Khae) operated by INSEE Ecocycle to recover RDF/plastic wastes for utilization in its cement plant in Saraburi. The dumped wastes in Nong-Khae and Nakhon Nayok contains 45.25% and 39.12% of plastic, respectively; the percent goes up in processed wastes to 58.84% and 60.44%, respectively.
- There are 104 landfills and 2380 dumpsites in Thailand. The results from the two sites were extrapolated; there are 97.48 million tonnes of plastic wastes estimated to be lying in dumpsites and another 90.42 million tonnes in landfills. Therefore, there is the potential of recovering 187.9 million tonnes of plastic wastes. The study recommends prioritizing plastic waste recovery from 41 provinces located in the coastal area, Chao Phraya and Mae Khlong river basins.
- Dr. Vincent Aloysius, CEO, INSEE Ecocycle-Thailand made a presentation on experiences of INSEE Ecocycle on landfill mining. INSEE Ecocycle is a Siam City Group (SCCC) company and extends waste management and industrial services. There are 200 employees and the business work with several third-party service providers.
- INSEE Ecocycle mines landfills for plastics to turn co-mingled, soiled plastics in to Refuse-Derived Fuels (RDF). INSEE Ecocycle currently operates four dumpsites in Thailand. In the dumpsites, the plastic wastes are dug up from landfill, separated from soil and other materials, shred down to below 50 mm size, homogenized and delivered to cement plants for further treatment.
- In 2018, Ecocycle has removed 19 495 tonnes of plastic wastes from landfills, substituting 16 000 tonnes of coal and reducing 33 100 tonnes of CO₂ emissions. INSEE Ecocycle has the ambition of achieving 20% TSR for which annually 250 000 tonnes of plastic wastes/RDF could be co-processed; this is three to four times than what is being co-processed today. INSEE Ecocycle aspires to enhance

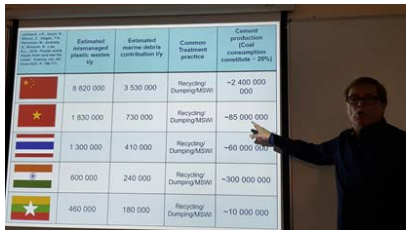
the capacity and competence on dumpsite reclamation and supply RDF to other end users (cement plants and waste-to-energy plants). There are, however, few challenges such as high costs of delivering Grade 3 RDF to Saraburi plant, asset utilization etc.

- Other big cement players in Thailand are SCG and TPI. TPI is mostly working on MSW issues and currently utilizing raw MSW in its captive power plant, whereas SCG has SCI Eco as its waste management business offering similar solutions as INSEE Ecocycle.
- Mr. Paradorn Chulajata, Chairman of FTI Plastic Industry Club, made a presentation on Thailand Public-Private Partnership for plastic and waste management (Thailand PPP Plastic). Thailand PPP Plastic is a national collaboration program between the Thai Government, private sectors and NGOs (such as TEI) to solve plastic waste issues in Thailand (total 33 organisations).
- Thailand was ranked 6th globally in terms of plastic waste release to oceans. In 2018, 2.1 million tonnes of post-consumer plastic waste were generated- 1.5 million tonnes were sent to landfills and incinerators, 0.4 million tonnes were recycled, and 0.01-0.03 million tonnes were likely to be released to the ocean from mismanagement.
- Thai government announced the national goal to 'reduce Thailand plastic ocean waste at least 50% by 2027'. Pollution Control Department (PCD) under MONRE has prepared a roadmap for plastic waste management (2018-2030).
- Since August 2018, Thailand PPP Plastic, led by the Federation of Thai Industry and Thailand Business Council for Sustainable Development (TBCSD), is appointed to be the 3rd Working Group of the Plastic Waste Management Sub-Committee, under the National Environmental Committee (NEC). NEC is headed by Thailand's Deputy Prime Minister.
- Thailand PPP Plastic's mission is to support the plastic circular economy by working with the government to shape country's direction and develop policy/legislation and with all stakeholders to improve current systems and infrastructures. There are six pillars namely (1) waste management infrastructure, (2) innovation, (3) education and communication, (4) policy and legislation, (5) database, and (6) funding. For example, Thailand's PPP Plastic has prepared a Material Flow Analysis with plastic in production, consumption and post-consumption phases and estimated release of plastic wastes into environment and oceans.
- For few work streams Thailand PPP Plastic collaborates with the other working groups led by deputy DG- PCD and deputy DG- Department of Environmental Quality Promotion.
- During the discussions, Dr. Kåre Helge mentioned that currently there are no good methodologies for assessing the release of plastics from mismanagement inland or from dumpsites. Any estimate would depend on several variables such as seasons, topography, hydrology which would be site-specific. For estimating the marine pollution avoidance potential, some assumptions on leakages need to be made.
- Ms. Vanessa Carriedo, Regional Communications Officer, IUCN, Bangkok, informed that IUCN has recently published a report listing different methodologies; SINTEF will follow the relevant studies.
- Mr. Paradorn Chulajata enquired if energy recovery of non-recyclable plastic waste in Cement Kilns (Co-processing) could be considered in the Plastic Circular Economy. Dr. Karstensen and Dr. Vincent

clarified that energy recovery in cement kilns (Co-processing) should be considered in Circular Economy initiatives as plastic waste is used as coal (fuel) substitute during cement production.

- SINTEF suggested that it would be good if the potential of Cement Kiln Co-processing in reducing the release of plastic wastes to the ocean and increasing the national waste treatment capacity could be showcased in the Thailand PPP Plastic led Working Group, as one of the solutions in integrated plastic waste management in Thailand.
- PPP Plastic, IUCN-Bangkok and TEI are open to collaborate with the OPTOCE project. The letter of intent could be signed for formally participating in or following the OPTOCE project activities in Thailand.

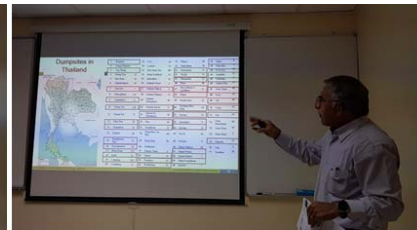
Photos from the Meeting



Dr. Karstensen from SINTEF introducing the OPTOCE project



Dr. Vincent Aloysius of Ecocycle-Thailand presenting achievements and challenges



Prof. Visvanathan of AIT presenting AIT's dumpsite study findings



Mr. Paradorn Chulataja presenting Thailand's PPP Plastics activities



Discussions in the meeting



AIT was the venue for the OPTOCE Inception Meeting on 10.09.2019