

Completion Report

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Plastic waste is internationally recognized as a problem, fuelled by increased public awareness of environmental concerns and the steady increase in waste import bans. Modern sorting and recycling technologies are mature, but face implementation limitations and the lack of corresponding management policies in developing countries such as Malaysia. Nowadays, the policy landscape has changed considerably to decrease the plastic waste output. For instance, Japan is known for extensive recycling systems than other countries, in which the 3R policy is well cultured and implemented.

Therefore, this study aimed to conduct a comparative study on the Japan policies and observe its best practices towards post-consumer plastic waste circular economy. This was done by executing interview, online survey, visit, and reviewing policies both in Japan and Malaysia. We have observed the best practices by Japan community, and municipal council in a city at Japan for better understanding on the policies implementation. Fortunately, we had an opportunity to visit Osaka city and Kamikatsu, the first municipality in Japan to make a zero-waste declaration. We observed the commitment of community and municipal council of Kamikatsu to implement 3R policy systematically. They have transformed its open-air burning practices for waste disposal into a system of recycling and reuse nearly all items from plastics, metal, paper, and food waste.

We have noticed several policies which being implemented by Japan have been identified , namely Solid Waste and Public Cleansing Management Act 2007 (Act 672) with Japan Law for the Promotion of Sorted Collection and Recycling Containers and Packaging (1995), Basic Act on Establishing a Sound Material-Cycle Society (2000), Recycling Guidelines (By Product Category, By Industry Sector) (2004), and Circular Economy Vision 2020 report issued by Japan Ministry of Economy, Trade and Industry (METI). Meanwhile, we observed similarities towards direction of reducing single-use plastic in both countries recently. This will enable us to see whether the The Malaysia's Roadmap Towards Zero Single-Use Plastic 2018-2030 should be a good policy direction reduce single-use and unnecessary plastics items. The Ministry of Environment and Water of Malaysia launched the Malaysia Plastics Sustainability Roadmap 2021 – 2030 in Dec 2021. Our main researcher Ir Dr Nor Yuliana Yuhana has been part of the effort.

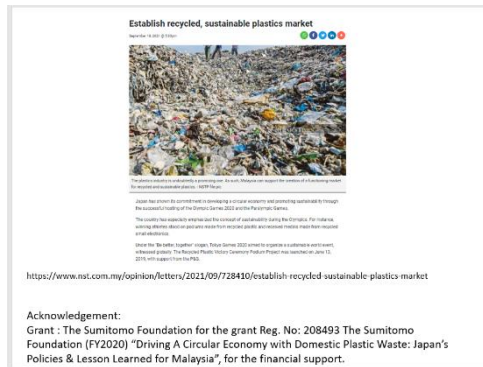
This research have analysed the pro and con of plastic disposal system including incineration system which will benefit Japan and Malaysia. From our literature review, we observed that Japan has taken several measures to reduce the emission of the gas. First of all, the complete combustion of plastic waste at a temperature of 800 °C and above in a furnace can prevent the release of dioxins from plastic waste. In addition, the use of air filters to filter dioxins and exhaust cooling to 200 °C or below 200 °C to prevent re-synthesis of dioxins are also measures to reduce dioxin emissions. Japan has succeeded in reducing dioxin emissions in energy recycling by 98% since 1997 after implementing the actions and methods mentioned above.

The online questionnaire survey was carried out in year 2022. Target number of respondents for the Malaysian and Japanese public is 100 people each. Questions in the questionnaire survey is in close-ended form. Among the findings, we observed that respondent in both countries have awareness about the policies that are implemented in their countries. There is a clear difference between the views of respondents Malaysia and Japan in which more respondents from Japan (81%) agree that they will bring their own bag when shopping compared to Malaysia respondents (64%). Most of the Japan respondents (91%) agree that they will separate the recyclable items at home compare to Malaysia respondents which only 56%. From the online survey and visit to Japan, it is clearly observed that Japan has strived for the sustainable development goals (SDGs) concept towards sustainable environment and sustainable cities. Hence, Malaysia could have an inspiration from Japan for better post-consumer plastic waste circular economy.

Publication of the Results of Research Project:

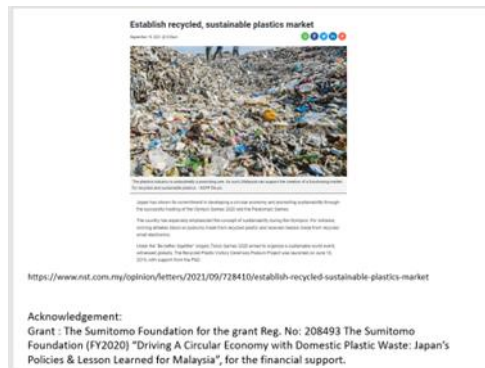
Verbal Presentation (Date, Venue, Name of Conference, Title of Presentation, Presenter, etc.)

1. Presenter : Nor Yuliana Yuhana. Together with students of the Plastic Engineering course KKKKR5942, we shared the outcome of our research to the staff of Ministry of Environment & Water, Malaysia, industries & the community through Webinar on Plastic Waste Issues : What Other Countries Do? - 25 Jun 2021).



Acknowledgement:
Grant : The Sumitomo Foundation for the grant Reg. No: 208493 The Sumitomo Foundation (FY2020) "Driving A Circular Economy with Domestic Plastic Waste: Japan's Policies & Lesson Learned for Malaysia", for the financial support.

2. Presenter : Nor Yuliana Yuhana. I talked on plastic issues to the industry & society, organized by the Institute of Engineers Malaysia, in conjunction with the National Technical Profession Day 2021. Webinar entitled "Plastics Sustainability : Challenges & Opportunities", 2 Dec 2021.



Acknowledgement:
Grant : The Sumitomo Foundation for the grant Reg. No: 208493 The Sumitomo Foundation (FY2020) "Driving A Circular Economy with Domestic Plastic Waste: Japan's Policies & Lesson Learned for Malaysia", for the financial support.

3. Presenter : Nor Yuliana Yuhana. A sharing session with industry & society through online webinar organized by Institute of Engineers Malaysia- Taylor's University on Plastic Sustainability, 27 April 2021.

IEM TAYLOR'S UNIVERSITY

SUSTAINABLE POLYMERS

Webinar (OPEN TO ALL)
Tuesday, 27th April 2021
2.00 pm-3.30pm

'WHAT IS POLYMER?'
BY DR. LOW JIU HOR
CENG. MICHELE
Chemical Engineering Programme
Taylor's University Malaysia

'PLASTICS AND SUSTAINABILITY'
BY DR. NOR YULIANA YUHANA
CENG. PING. MICHÉLE
Department of Chemical and Process Engineering
Universiti Kebangsaan Malaysia

Meeting ID: 989 3262 2075
Passcode: 828955

Zoom QR code and 'Scan Me!' text.

Establish recycled, sustainable plastics market

https://www.nst.com.my/opinion/letters/2021/09/728410/establish-recycled-sustainable-plastics-market

Acknowledgement:
Grant : The Sumitomo Foundation for the grant Reg. No: 208493 The Sumitomo Foundation (FY2020) "Driving A Circular Economy with Domestic Plastic Waste: Japan's Policies & Lesson Learned for Malaysia", for the financial support.

4. Presenter : Nor Yuliana Yuhana. A sharing session with community of Pantai Kelanang, Selangor, Malaysia (10 Julai 2023).



Thesis (Name of Journal and its Date, Title and Author of Thesis, etc.)

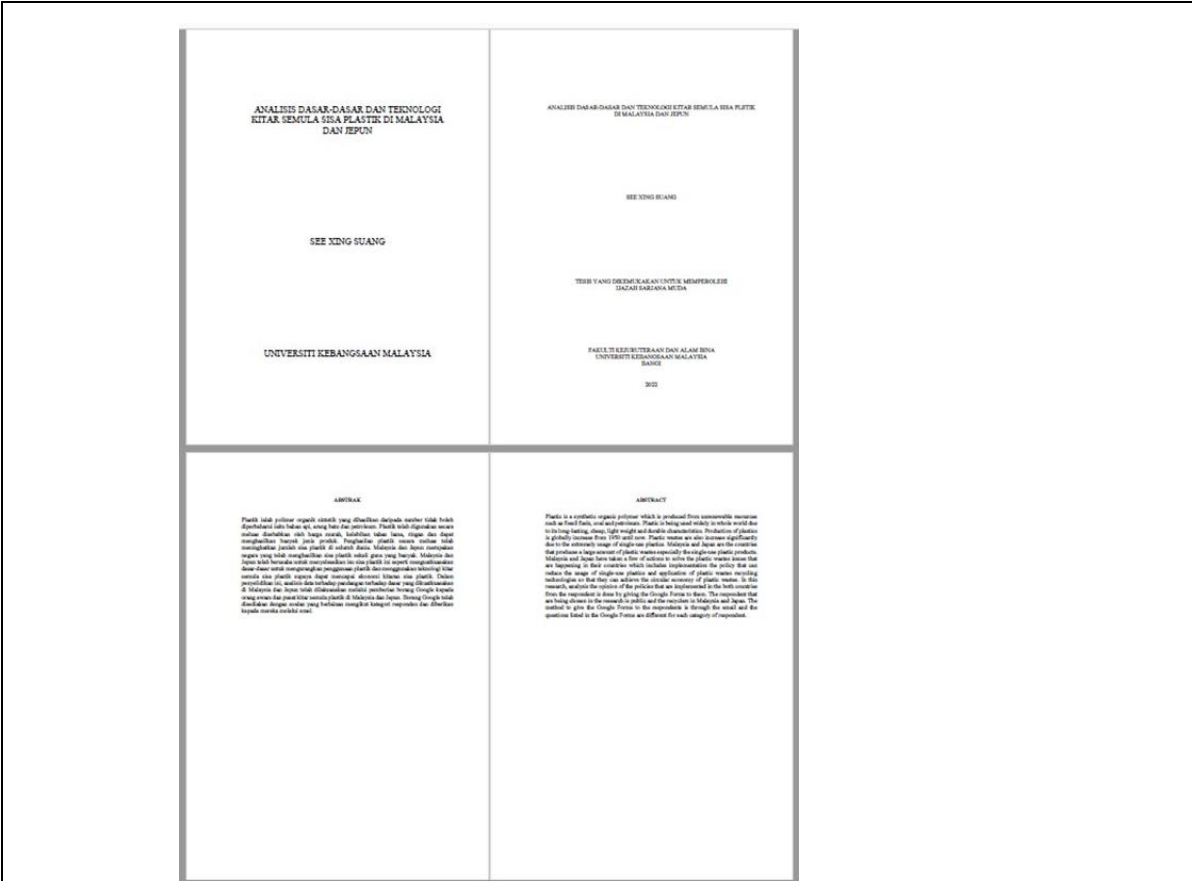
1. Research at the Final Year Undergraduate Project level (Session 2021/2022). Title : Policy Analysis and Technology of Plastic Recycling in Malaysia and Japan. Student: See Xing Xuang & Shabbah Begum. Research Output : Project Report

ANALYSIS ON POLICIES AND TECHNOLOGIES ON PLASTIC WASTES IN MALAYSIA AND JAPAN

Analisis Dasar-dasar dan Teknologi Kitar Semula Sisa Plastik di Malaysia dan Japan
See Xing Xuang, Nor Yuliana Yuhana
Department of Chemical and Process Engineering, Faculty of Engineering & Built Environment,
Universiti Kebangsaan Malaysia

ABSTRACT

Plastic is a synthetic organic polymer which is produced from unrenewable resources such as fossil fuels, coal and petroleum. Plastic is being used widely in whole world due to its long-lasting, cheap, light weight and durable characteristics. Production of plastics is globally increase from 1950 until now. Plastic wastes are also increase significantly due to the extremely usage of single-use plastics. Malaysia and Japan are the countries that produces a large amount of plastic wastes especially the single-use plastic products. Malaysia and Japan have taken a few of actions to solve the plastic wastes issues that are happening in their countries which includes implementation the policy that can reduce the usage of single-use plastics and application of plastic wastes recycling technologies so that they can achieve the circular economy of plastic wastes. This research focuses on the views and opinions of public from Malaysia and Japan about the policies that are implemented in Malaysia and Japan to reduce the plastic wastes through questionnaire survey. Furthermore, this research also focuses on the comparison of policies implemented and plastic wastes recycling technologies between Malaysia and Japan. The questionnaire survey is carried out from March 2022 to May 2022 in Malaysia and Japan. Data that are collected are analyzed by using descriptive statistics. The results show that respondent in both countries have awareness about the policies that are implemented in their countries and these policies can help to reduce plastic wastes. However, some respondents Malaysia do not practice some actions to support the policies. Malaysia could refer Japan as role model in terms of policies and plastic wastes recycling technologies. The authors would like to acknowledge The Sumitomo Foundation for the grant Reg. No: 208493 The Sumitomo Foundation (FY2020) "Driving A Circular Economy with Domestic Plastic Waste: Japan's Policies & Lesson Learned for Malaysia", for the financial support.



Book (Publisher and Date of the Book, Title and Author of the Book, etc.)

1. Writing in newspapers related to plastic sustainability that can be inspired from Japan.

NY Yuhana, Establish recycled, sustainable plastics market, 18 Sept 2021, New Straits Times

(rujuk :

<https://www.nst.com.my/opinion/letters/2021/09/728410/establish-recycled-sustainable-plastics-market>)

Establish recycled, sustainable plastics market

September 18, 2021 @ 5:33pm



The plastics industry is undoubtedly a promising one. As such, Malaysia can support the creation of a functioning market for recycled and sustainable plastics. - NSTP file pic

Japan has shown its commitment in developing a circular economy and promoting sustainability through the successful hosting of the Olympic Games 2020 and the Paralympic Games.

The country has especially emphasized the concept of sustainability during the Olympics. For instance, winning athletes stood on podiums made from recycled plastic and received medals made from recycled small electronics.

Under the "Be better, together" slogan, Tokyo Games 2020 aimed to organize a sustainable world event, witnessed globally. The Recycled Plastic Victory Ceremony Podium Project was launched on June 13, 2019, with support from the P&G.

Establish recycled, sustainable plastics market

September 18, 2021 @ 5:33pm



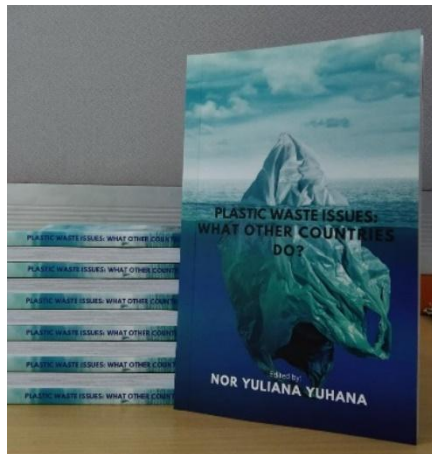
The plastics industry is undoubtedly a promising one. As such, Malaysia can support the creation of a functioning market for recycled and sustainable plastics. - NSTP file pic

<https://www.nst.com.my/opinion/features/2021/09/728152/establish-recycled-sustainable-plastics-market>

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Grant : The Sumitomo Foundation for the grant Reg. No: 208493 The Sumitomo Foundation (FY2020) "Driving A Circular Economy with Domestic Plastic Waste: Japan's Policies & Lesson Learned for Malaysia", for the financial support.

2. Nor Yuliana Yuhana. (2022). Plastic Waste Issues : What Other Countries Do?. Fakulti Kejuruteraan & Alam Bina, UKM.



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&

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