



EUROPEAN CLIMATE, INFRASTRUCTURE AND ENVIRONMENT EXECUTIVE AGENCY (CINEA)

CINEA.D – Natural Resources, Climate, Sustainable Blue Economy and Clean Energy
CINEA.D.3 – Sustainable Blue Economy

Ecomondo 2021

TRANSFORMING PLASTIC LITTER INTO NEW CHEMICALS? OPPORTUNITIES AND CHALLENGES FOR INNOVATIVE PYROLYSIS PLANTS

#BLUE-GREEN-CINEA

26 October 2021, Rimini Expo, Room Ravezzi 2 South Hall, Italy

Summary Report

Discussing the opportunities and challenges of innovative technologies for chemical recycling of plastic litter, including marine litter, was the focus of the round table at one of the thematic Blue Growth sessions organised by CINEA during Ecomondo 2021.

The session took place on 26 October 2021 in a hybrid modality, and saw a broad participation of stakeholders, including EU and national policy makers, EU funded project coordinators, representatives of ports, ship owners, industry and investors.

The session started presenting the initiatives and instruments that the European Commission is putting in place to tackle plastic and marine litter and that are needed for a sustainable blue economy.

The presentations of the following case studies fed the discussion with experiences on the ground:

- the EMFF funded project **marGnet**
- the Life funded project **LIFE ECOMETHYLAL**
- the case of the **Port of Moerdijk** (NL)

From the presented case studies, chemical recycling processes of complex plastics waste flows, as marine litter, show a significant potential to contribute to the objectives of the European Green Deal, the Circular Economy Action Plan, the Zero Pollution Ambition, and of the Sustainable Blue Economy. Still, to fully exploit this potential, technological, economic and legislative challenges may need to be addressed.

The round table discussion that took place after the presentations of the case studies highlighted the following points:

- The European Strategy for Plastics in a Circular Economy, the European Green Deal, the Circular Economy Action Plan, and the Zero Pollution action Plan represent a policy framework with the ambition of achieving **10 million tons of recycled plastics** in new products on the EU market **by 2025**, and improving water quality by **reducing plastic litter at sea by 50%, and microplastics released into the environment by 30%**.
- The **Waste Framework Directive**, as amended in 2018, and the **Directive on single use plastics (2019)** are the main legislative instruments that the EU has already in place.

- At EU level, new initiatives are in the pipeline in particular for plastics: **mandatory requirements for recycled content and waste reduction measures**, addressing the presence of **microplastics** in the environment (cosmetics, detergents, paints, pellets, textile, tyres), and a **policy framework on bio-based and biodegradable plastics** (studies on addressing biobased plastics, compostable plastics, use of biodegradable plastics).
- In addition, the **revision of the Packaging and Packaging Waste Directive**, planned for 2022, is expected to include new measures for prevention, design for reuse and recycling of packaging. The aim is that all packaging on the EU market is reusable or recyclable by 2030.
- For all set of measures, research and innovation would be very important.
- In Italy, the [National Strategy for Circular Economy of September 2021](#) focuses on **eco-design and eco-efficiency to boost the national recycling sector**, including support for mechanical and chemical recycling for plastics.
- In the Italian national recovery and resilience plan there are measures to support collection system, in particular it includes investments for the implementation of **plastics hubs** (from collection to transport to mechanical and chemical recycling) of about 600 M EUR.
- The transposition of the directive on Single Use Plastic in Italy is expected to address also bioplastics.
- For the End of Waste (EoW) Criteria, in Italy there are regulations at national and regional level. Italy is trying to push national registration to reduce the regional divide by setting up a **national platform to share regional schemes of EoW**. Sharing of administrative capacity and technical knowledge is crucial.
- Specifically for marine litter, during the Italian presidency, the G20 conclusions include a **shared commitment in renewing effort in reducing marine litter** recognizing the need to tackle plastic pollution, including, but not limited to, by adhering to the waste hierarchy and implementing a comprehensive life-cycle approach. In Italy marine litter is addressed in the so called “Legge Salvamare”.
- From the **port authority perspective**, collecting and recycling marine litter is an opportunity to achieve a circular economy and not just an obligation coming from legislation. It is important, however, to create upstream an appropriate management of waste, with an assessment of the treatment options available beyond mechanical recycling. Examples of projects that use chemical treatment to transform marine litter into energy and achieved good results already exist. A simplification of the legislative framework would facilitate the permitting for making use of innovative solutions.
- From the **Fishing Ship-owners perspective**, there is the need for a **harmonized legislation to valorize marine litter** and that goes beyond the International Convention for the Prevention of Pollution from Ships (MARPOL). There are constraints for fishers to bring to ports entangled waste as the space in vessel is limited and because fishers are charged for the disposal of collected waste. Experience with the EU funded project [OCEANET](#) shows that **innovative solutions together with the engagement of fishers and vessels owners** can tackle the issue of marine litter and provide a second life to fishing gears.
- From the **plastics industry perspective**, there is a **clear commitment** in developing chemical recycling and pyrolysis processes for the treatment of complex waste streams to complement mechanical recycling and to reach EU target for plastic recycling and GHG reduction. In particular, chemical recycling is key as it allows producing new polymers that can be used in

food contact applications. On the other hand, chemical recycling processes raise some **questions on the application of regulatory framework**, as they can generate different outputs that can have multiple users, e.g. products or inputs in co-processing. This makes very difficult to link the input to the output of a recycling process, in particular when **one of the output is fuel used in intermediary steps of the recycling chain**. Therefore, it would be important to clarify how to apply the Waste Framework Directive in complex recycling processes, as it excludes the production of fuel from the definition of recycling processes. A legal assessment would be needed to explore which rule for attributing the recycling characteristics to one or several outputs of chemical treatment processes would be in line with the legal definition of recycling.

- From the **investors' perspectives**, chemical recycling is a **promising area**. Many start-ups are trying to develop solutions for ports and ships for proper and cost efficient management and disposal of waste. There are, however, issues linked to the **variability of waste price and access to raw materials** that have to be clearly addressed in their business plans. In addition, it is important to **trace the value claimed in terms of environmental benefits** of the proposed processes. Pyrolysis may be a valid option for large mass of waste that cannot be recycled today with current mechanical recycling technologies. In the future, there may be different conditions for investments. The much diversified value chain of chemical recycling of plastic may involve various types of investors at different stages.

Summarising the main indications that we can get from the discussions are the following:

- For complex plastic waste streams, chemical recycling including pyrolysis for fuel recovery can be considered as a valid option to mechanical recycling to achieve EU recycling targets.
- An enabling legislative framework should address the issues of the collection at sea of marine litter and its handling on the mainland, in particular in ports, and of the definition of clear criteria for assessing the status of waste for marine litter and other plastic litter that can be delivered in ports from ships.
- The development of chemical recycling and pyrolysis would benefit from a clear application of the EU Waste Framework Directive, especially when chemical and pyrolysis processes lead to the production of fuels, as one of the outputs, at different level of the process.
- For the development of innovative solutions, it is essential to engage with local authorities for facilitating the testing of innovative plants.
- Awareness campaigns are needed to inform and engage with local players, as fishers and ports authorities, and in general local communities, on reducing plastic and marine litter, sharing good practice, and make use of the available technologies developed by the projects to treat these waste flows.
- EU will provide future interesting funding opportunities, as in the new European Maritime Fisheries and Aquaculture Fund and Horizon Europe, in particular in the frame of the Horizon Europe Ocean Mission.
- Investments, both public and private, can facilitate the development of more efficient solutions for chemical recycling plants.

Agenda

- 10:00–10:30 **Registrations**
- 10:30–10:35 **Welcome message**
Luca Marangoni, deputy Head of Unit at CINEA, European Commission
- 10:35–10:45 **Sustainable Blue Economy and Marine Litter: where we stand**
Alena Petrikovicova - De Chevilly, Policy Officer at DG MARE, European Commission
- 10:45–11:00 **The case of the EU funded project marGnet**
Gian Claudio Faussonne (Sintol s.r.l.)
Fantina Madricardo (Cnr-ISMAR)
- 11:00–11:15 **The case of the EU funded project LIFE ECOMETHYLAL**
Alberto Barranca Jiménez (AIMPLAS)
- 11:15–11:30 **The case of the port of Moerdijk (NL)**
Jayand Baladien (Port Authority of Moerdijk)
- 11:30–12:30 **Round table discussion on sustainable options for tackling plastics waste, including marine litter: regulatory and market challenges**
Paola Migliorini, Deputy Head of Unit “Sustainable Production, Products & Consumption”
DG Environment (European Commission, DG Environment)
Laura D’Aprile, Director of Department for Ecological Transition (Italian Ministry of Ecological Transition)
Simona Giovagnoni, Secretariat General of the Associazione Nazionale Servizi Ecologici Portuali e la tutela dell’Ambiente marino (ANSEP UNITAM)
Ángela Cortina, Technical Secretary of the Fishing Shipowners’ Cooperative of the Port of Vigo (ARVI)
Hervé MILLET, *Climate & Production Director* (PlasticsEurope)
Rita Sousa (Blue Pioneers)
Baptiste Le Clerc, Investment Associate (Telos Impact)
- 12.30–12:45 **Closure**
Luca Marangoni, deputy Head of Unit at CINEA, European Commission