



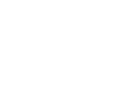
# demeto

## Newsletter September 2019



### How does DEMETO revolutionise PET recycling?

Today it is hard to imagine a world without PET. We drink from it, we eat from it and we even wear it. Yet only some of the products are being recycled. Let's close the loop. Check out the new DEMETO [brochure](#) and [presentation](#) showing the progress of the project.



### The Industrial Advisory Board of DEMETO

– experts from the entire value chain

DEMETO does not only consist of consortium partners from the entire value chain. In order to get the most out of the Horizon 2020 project, the partners are **supported by an Industrial Advisory Board that provides feedback and comments to steer the direction of DEMETO's business development activities.** The IAB consists of top brands of home textile, sportswear textile, fashion textile, home and personal care and drinks, as well as plastic converters, waste collectors and recyclers: a2a, Adidas, ALPLA, Coca-Cola, EIT RawMaterials, Henkel, Ikea, Kolon Industries, Logoplaste, MAKSC, Nestle Waters, OVS, Petcore Europe, Remondis, SEFEA IMPACT, SOEX, Sorema, Suez, Unilever, TWD Fibres and Waste2Wear.



The Industrial Advisory Board of Demeto – experts from the entire value chain

### Participation in CHEMICAL RECYCLING CONFERENCE

On 4 June, Chemical Recycling Europe (ChemRecEurope) organised a first conference on European Chemical Recycling to discuss this innovative form of plastics recycling and to address the evermore pertinent issue of circular economy: "Recycling targets set up in the EU Circular Economy Package will not be achievable without the development of chemical recycling. To boost circular economy, stem the flow of plastics into landfill and our environment and to answer the inherent limitations of current mechanical recycling, Chemical Recycling can be a solution to these limits as a complement to the existing system.", said Maurizio Crippa from gr3n. [Read more](#)



### First Review Meeting in Brussels - Synesis

On 15 March, the DEMETO project held its mid-term review meeting in Brussels, during which the European Commission, represented by the Project Officer and the Technical Monitor, assessed the state of development of the activities.

The project Coordinator, NextChem, supported by all the Work Package leaders, presented how DEMETO has achieved all its expected technical and strategic milestones, facing many R&D challenges that are natural for a path towards the solution the plastic waste global problem. In particular:

- A full re-design of the depolymerisation Reactive Unit was completed by Synesis and gr3n in March 2019, enabling the procurement phase that is currently in a deep stage of advancement;
- The whole downstream purification process was validated experimentally by DTU and gr3n, providing invaluable insights needed for the engineering of the pilot plant;
- NextChem concluded the major steps of design for DEMETO's pilot plant, starting the optimisation and procurement phase of the project, aligned with a commissioning for the end of the year;
- 3V-Tech finalised the design of the optimal Chlor-Alkali unit, which is now being realised for an autumn commissioning;
- A detailed analysis of the PET and Polyester value chains was accomplished by gr3n and NextChem, with the support of EuPC, EOG, H&M and, more generally, all partners, leading to deep restructuring of DEMETO business plan.

Overall, the feedback received from the European Commission has been therefore very positive, granting a relevant strategic support to the Consortium towards the final achievement of its very challenging results.

The next major milestone is now set for the end of the year, when the commissioning phase for the pilot plant will start. Legislative assessment for the construction site is already on-going and the civil works will start intensely at the beginning of September.



### H2020 Plastics Circularity Multiplier

On 3 June 2019, DEMETO welcomed twelve other ongoing European Projects on Plastics Circularity to explore possible synergies in a meeting held at the EuPC offices in Brussels. During the workshop, the participants were invited to make a brief presentation of their projects, before focusing on the common regulatory and scale-up challenges. Keti Medarova-Bergstrom, Project adviser H2020 Eco-innovation - EASME, was also present at the meeting and provided valuable input for future collaboration and synergies. [Read more](#)



### The role of solid-state microwave generators in DEMETO

Microwave generators are used in a lot of different applications ranging from simple heating processes to high-performance depolymerisation systems. As long ago as 1920, the Siemens corporation invented the magnetron and since then they found their manifold cases of application. But there's a potentially major trend in the contemporary microwave-heating technology, namely the insertion of solid-state microwave sources.

Such a transition from vacuum tubes (e. g. a magnetron) to solid-state electronics already occurred decades ago in areas of communication, computers and control. And now also in the microwave heating field such a transition is observable. Solid-state microwave generators are offering different advantages over magnetrons such as frequency and phase variability and control, low input-voltage, compactness and rigidity. But there are still some challenges, which must be considered. Mainly those generators are more expensive and their efficiency (at least for heating applications) is yet lower than that of magnetrons.

The transition from magnetrons to solid-state is also characterised by the different engineering methodologies and skills required. While working with magnetrons often includes intuition and gut feelings (which you get through years of experience), working with solid-state generators initially requires computer modelling for the design of the dynamic microwave-heating mechanism and its control. In a nutshell, you can't directly compare magnetrons and solid-state microwave generators. Each industrial heating application is different and needs a specialized solution either including magnetrons or solid-state solutions.

Fricke und Mallah Microwave Technology GmbH, located in Peine, Germany, is a leading manufacturer of both magnetrons and solid-state based microwave generators with many years of experience.

"Together with the customer, we always find the best possible solution including either of those technologies. As a future-oriented company we are feeling honoured to work on the DEMETO project to hopefully eliminate the plastics waste on earth someday."



### Optimisation of the DEMETO reactor

SUPSI has significantly detailed simulations of the electromagnetic behaviour of different chamber through the detailed simulations of the electromagnetic behaviour of different typologies of the DEMETO reactor. The original design concept developed has been analysed to allow subsequent comparison with new reactor proposals. The thermodynamic behaviour of the actual reactor has been modelled to predict and control the temperature evolution of the PET-based mixture along the depolymerisation process. At the end of this task, the various EM models of reactors analysed have been compared to choose the best version according to different criteria and strategic rules to guarantee a homogeneous electrical field distribution into the mixture, avoid thermal hot spots into the mixture, find a cheaper reaction design and increment the mixture material processing ratio.

Afterwards an optimisation procedure is sustained in these task to improve the overall design of the MW-based reaction chamber with the objective to increase the value of the most relevant key performance indicators, such as velocity of the reaction, energy consumption, energy recovery, etc.

The implementation of the thermal model of the DEMETO reactor has been validated and the model has been simplified to be usable to control the process along the reactor. SUPSI is currently working on the development of a new type of evaporator.



### Upcoming events

- 23/09/2019 Plastics Circularity Multiplier webinar
- 24/10/2019 Industrial Advisory Board meeting
- 05-08/11/2019 Ecomondo Expo



Avenue de Cortenberg 71  
1000 Brussels – Belgium  
[info@demeto.eu](mailto:info@demeto.eu)  
[www.demeto.eu](http://www.demeto.eu)



The project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement no 768573

