



FIT-4-NMP

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to NMP projects under Horizon Europe

HIGH-PERFORMANCE and SUSTAINABLE COMPOSITES INNOVATION WORKSHOP TU DRESDEN 13-14.10.2022

*Łukasiewicz Research Network – Automotive Industry Institute
(Łukasiewicz-PIMOT), Fuels & Bioeconomy Research Group
Piotr Wieczorek
Poland*



This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 958255

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Łukasiewicz Research Network - Automotive Industry Institute:

- was established in 1972 as an independent research and development unit operating in the field of the automotive industry.
- Since April 2019 ŁUKASIEWICZ – PIMOT is a part of Łukasiewicz Research Network

Fuels & Bioeconomy Research Group:

- A group of experienced scientists, combining research, teaching and work for the needs of industry;
- National and international legal acts consulting;
- International activity of the team: IRENA leading expert, ETIP Bioenergy & RH&C SC members;
- Associate member of CBE JU (BBI), member of UPEB(B)I;
- Ongoing project: EUREKA Nr E! 13358, Acronym: BIOGASDRIVE „The use of pre-purified biogas as a fuel to supply the engines of agriculture vehicles and machinery”;
- Commercial projects (examples): Fixed-bed catalytic reactor experiments for evaluation of reaction and deactivation kinetics of Propane Dehydrogenation (PDH) process; Development of a new technology dedicated to recycling of large-size vehicles, including heavy goods vehicles and/or their components.



Łukasiewicz
Przemysłowy
Instytut
Motoryzacji



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HORIZON-CL4-2024-RESILIENCE-01-24: DEVELOPMENT OF SAFE AND SUSTAINABLE BY DESIGN ALTERNATIVES (IA)

1. My key idea for contribution to a project under this topic

Problem: It is not the plastic itself that is bad, but what we do with it. Polymeric materials have many advantages for example low density, high mechanical strength relative to weight, durability or corrosion resistance. For this reason, they are construction materials commonly used in various areas of the economy. The biggest problem is the reuse of contaminated polymer waste, multi-component materials or polymer waste of poor utility quality. They constitute a heavy burden on the environment and economy, and their management through incineration prevents the effective use of this waste.

Solution: Here we present a novel thermolysis process, which is energy self-efficient (after starting phase), carried out at about atmospheric pressure, based on reactive distillation, and allows to obtain various streams of hydrocarbons from different waste streams, mostly waste plastics (PE, PP, PS). Our solution is currently at TRL 7 – for most common streams. New raw material streams for the process can be scaled up relatively quickly.

2. Competences relevant to the topic and motivation to apply

- Production of a dedicated (green) hydrocarbon stream from a selected category of waste, for direct use or further conversion in a selected chemical proces, application of green hydrogen (if needed)
- Hydrocarbon stream separation and analyzis
- Test scaling - from lab setup to demo
- LCA analyzis, building social awarness (with University partners)

Why us: knowledge transfer, expanding competences, building new contacts, technology development, scientific and research excellence



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HORIZON-CL4-2024-RESILIENCE-01-24: DEVELOPMENT OF SAFE AND SUSTAINABLE BY DESIGN ALTERNATIVES (IA)

Industrial partner ready to join the project:
Handerek Technologies & it's a new spin-off

- SME located in Warsaw & Zgierz
- Patents co-owner (together with people from my team), technology developer, plant owner
- Already participated in public-funded projects



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HORIZON-CL4-2023-TWIN-TRANSITION-01-31 HORIZON-CL4-2024-RESILIENCE-01-24 RELEVANT EQUIPMENT AND FACILITIES

- People: team qualified in research, including patent co-owners, lab personnel with significant experience in testing samples, plant operating personnel (at an industrial partner);
- Infrastructure: installation on a semi-technical scale located in the Institute (with a separate hydrogenation module), larger, demo-scale plant (under final commissioning) located in Zgierz, Poland (at partner's site), PCA-accredited analytical lab in the Institute, the ability to perform LCA analyzes;
- Other: advanced cooperation with external labs to perform analysis not covered by our lab.



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Piotr Wiczorek

Łukasiewicz Research Network – Automotive Industry Institute
(Łukasiewicz-PIMOT)

Head of Fuels & Bioeconomy Research Group

piotr.wiczorek@pimot.lukasiewicz.gov.pl

+48 22 7777 234



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