

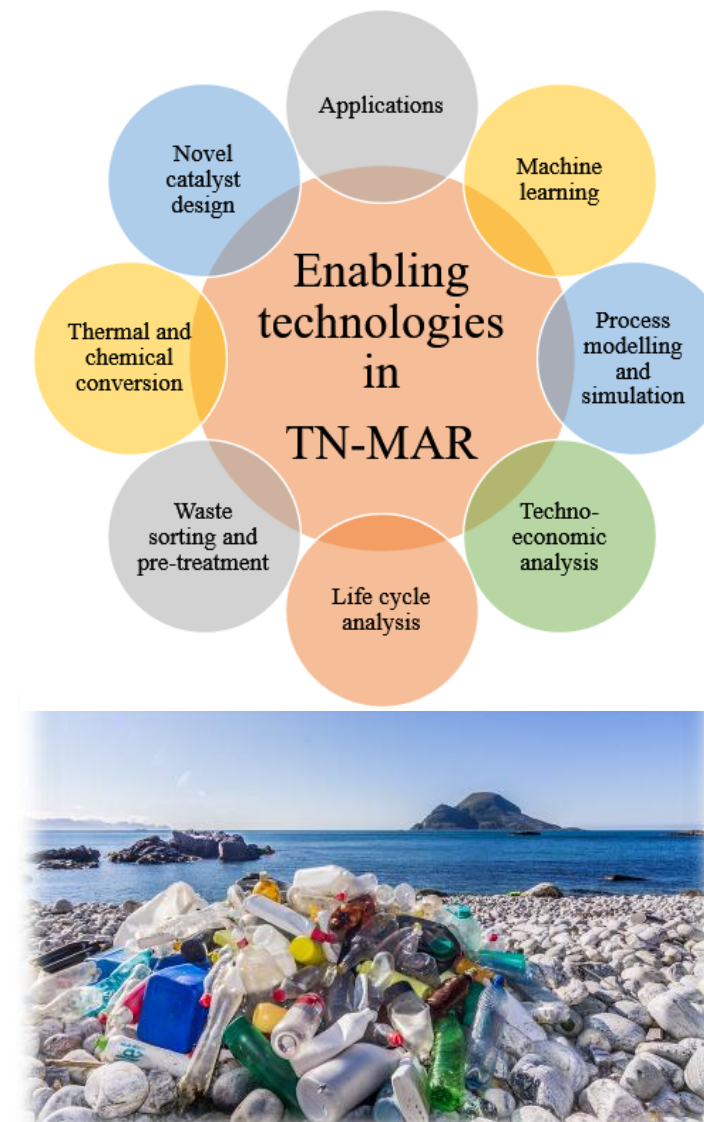
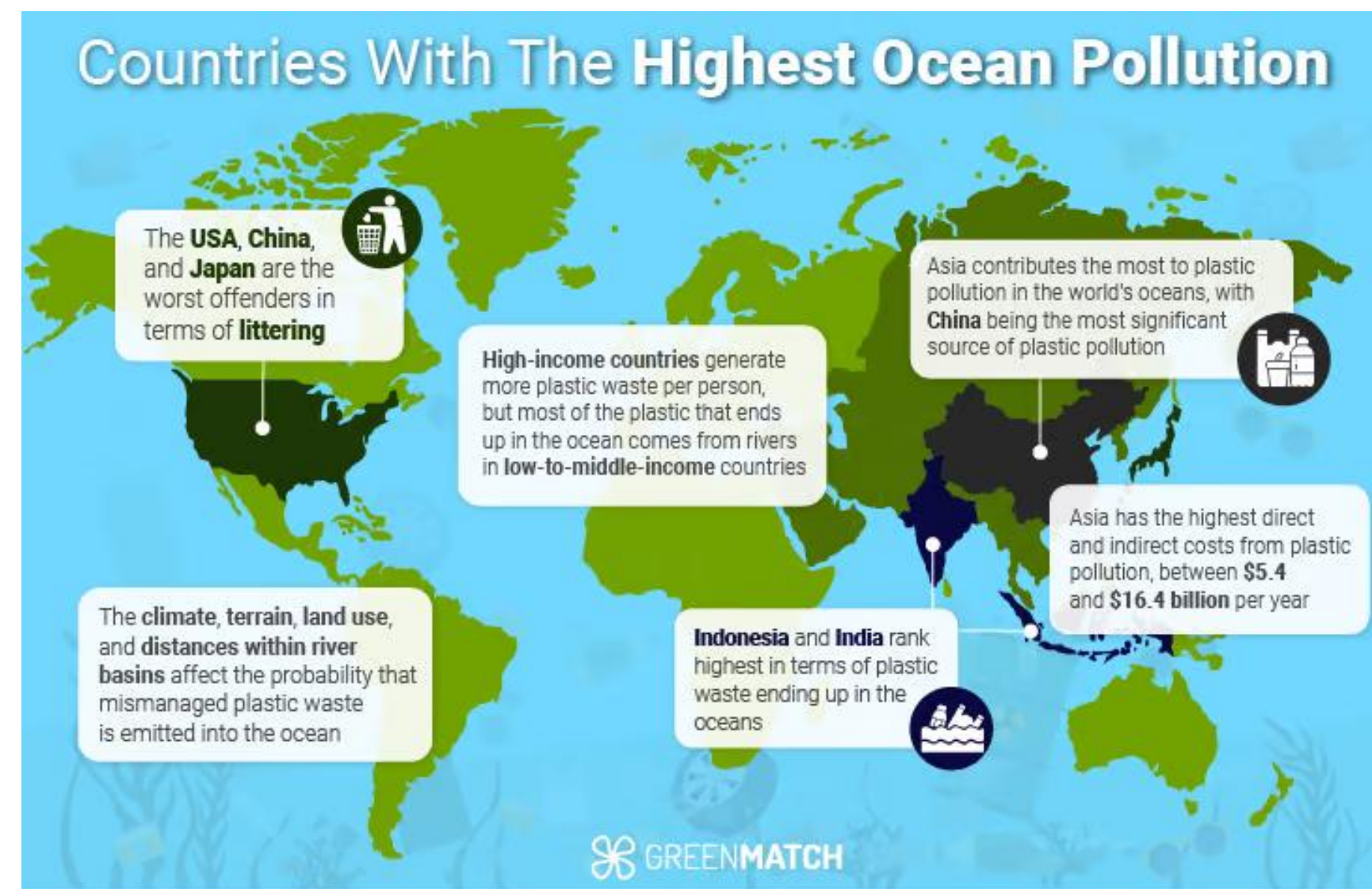


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Marine plastic waste management according to circular economy concept through the interdisciplinary and international cooperation

The CUPOLA project is the international, interdisciplinary, and intersectoral research and innovation project aiming to find solutions to this global problem. The main goal of the CUPOLA project is to establish long-term research cooperation between institutions with complementary expertise to design and develop carbon-neutral, scalable, and socially acceptable methods to sort and convert plastic waste into valuable chemicals and materials. The originality of CUPOLA lies in the collaborative network among experimentalists, theoreticians, and industrialists. Key technologies in the project include waste sorting and pre-treatment methods. Novel pneumatic systems are developed for the separation of waste plastics, effectively separating the plastic waste into PET-rich, PO-rich, and PA-rich streams.



Acknowledgement

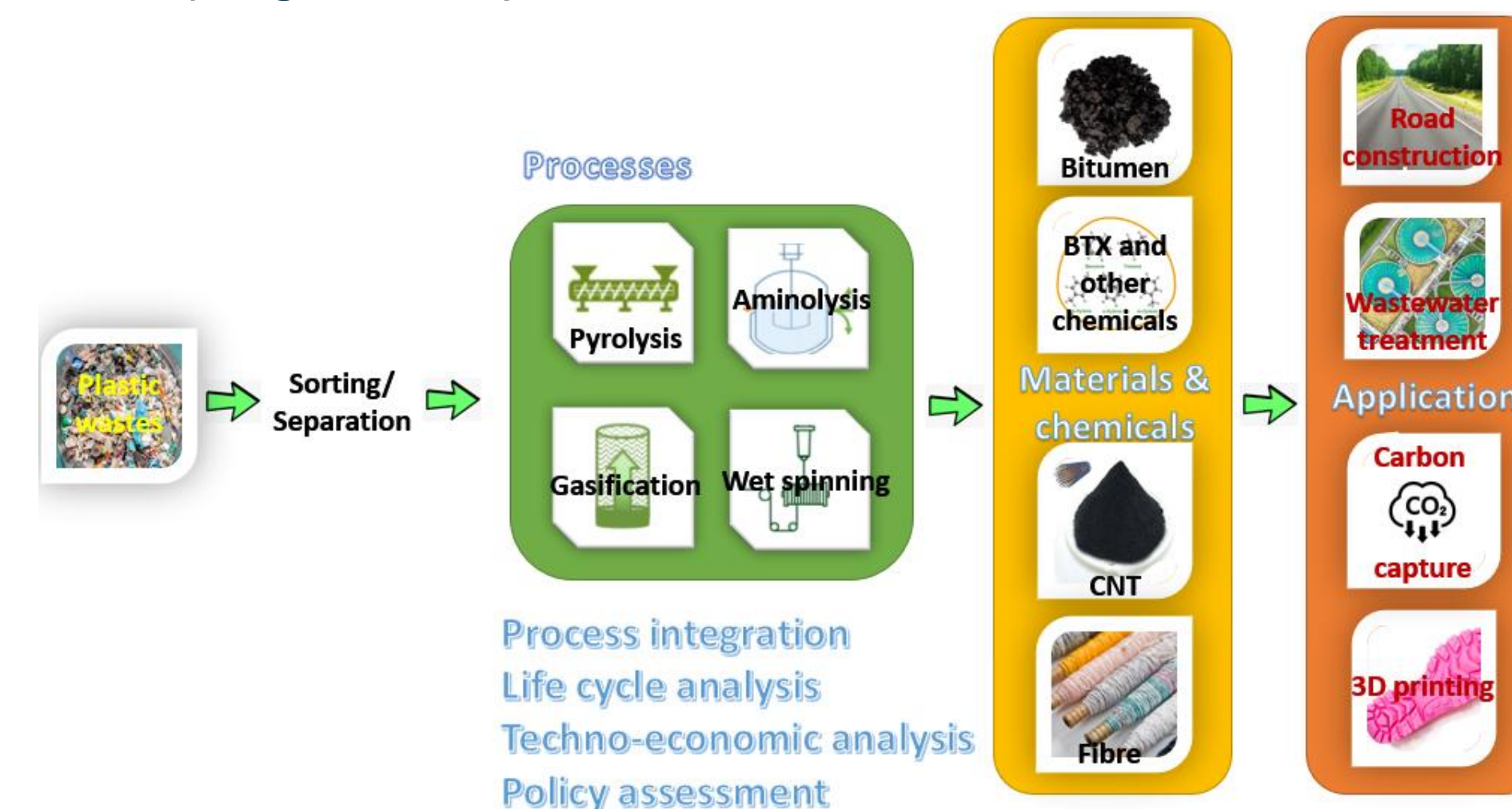
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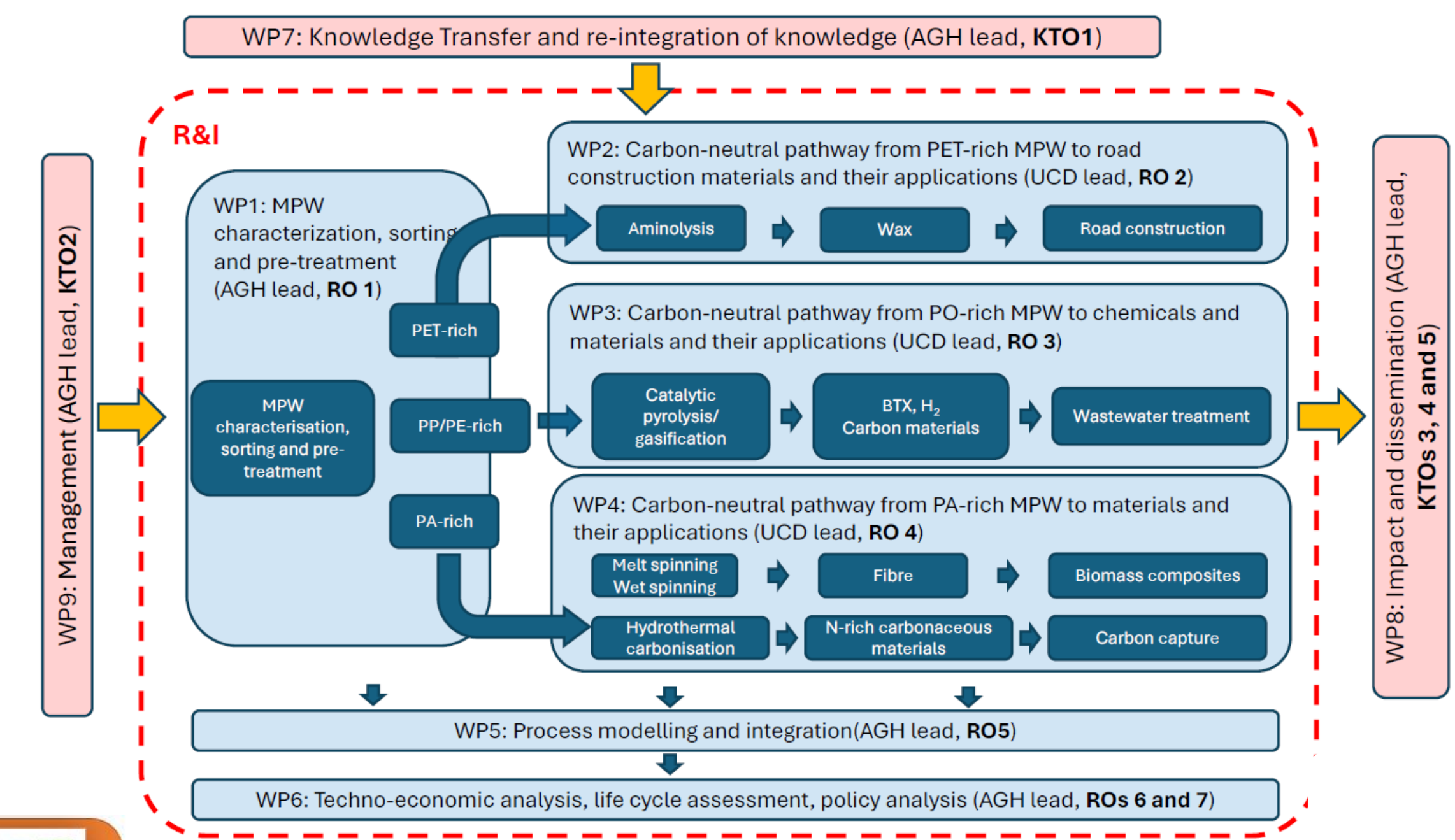
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The successful separation of plastic waste is crucial for the subsequent mechanical and chemical recycling processes. Thermochemical processes such as catalytic pyrolysis, catalytic gasification, aminolysis, and hydrothermal carbonization are applied to convert feedstocks into valuable chemicals and materials. For instance, the PET-rich stream will be transformed into bitumen additives through aminolysis, while the polyolefin-rich stream will be converted to benzene, toluene, and xylenes (BTX) via catalytic pyrolysis, and to H₂ and carbon nanotubes through catalytic gasification. The project will involve process modeling, techno-economic analysis, and life cycle assessment to provide essential information about the economic viability and environmental impact of these processes. This project has the potential to bring together a wide range of research and industry groups in chemistry, chemical engineering, civil engineering, mechanical engineering, environmental science, and computer science to collaborate on the recycling of marine plastic waste.



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