



# CIRCULAR PLASTICS

Project Ideas JIP 2019

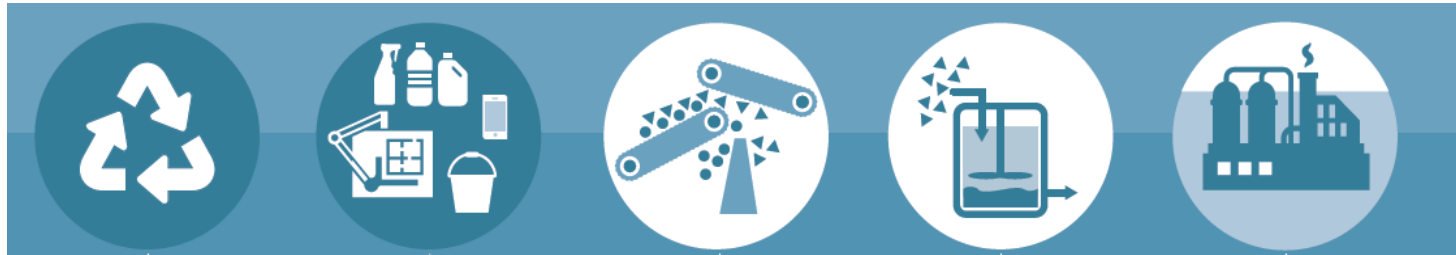
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# MMIP 6 CLOSING OF INDUSTRIAL LOOPS

## OBJECTIVE

We aim to reduce 80 PJ of crude oil and 4 Mton of embedded CO<sub>2</sub> in 2050. This is approx. 15% of the of the energy and CO<sub>2</sub> emissions of all plastics produced in the Netherlands (of which ¾ is exported).



Chain development and LCA

Design for recycling

Mechanical recycling

Chemical recycling

Thermal recycling

# FRAMEWORK FOR ASSESSMENT ON RECYCLABILITY OF NOVEL ALL POLYOLEFIN MULTILAYER PACKAGING

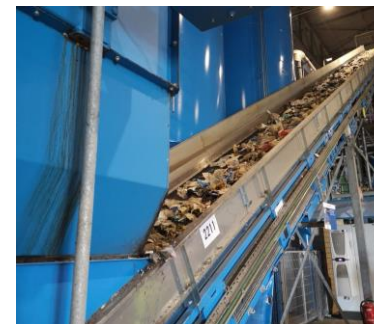
## › Objective

- › to set a framework for assessment of recyclability of novel all-polyolefin multilayer film packaging design. This framework will include: (a) experimental testing of the feasibility by thermal, chemical and mechanical recycling methods, (b) assessment of these methods on impact (sustainability), (c) setting guidelines for packaging design made from all-polyolefin multilayer films.

## › Approach/result

- › Feasibility testing of different recycling techniques
- › Determination of costs and environmental impact
- › Define guidelines for recyclability

## › Needed: companies from the value chain



# CHEMICAL RECYCLING OF WEEE PLASTICS TO RECOVER POLYMERS, ADDITIVES AND METALS

## › Objective

- › test the feasibility of recovery of polymers and of other materials like additives and metals from WEEE plastics by chemical recycling technology as an alternative for conventional incineration methods.

## › Approach

- › Pyrolysis: recovery of non volatile additives (metals)
- › Solvo-chemical recycling: recovery of polymers and additives

## › Needed: Companies of the value chain

# CHEMICAL RECYCLING OF COMPOSITES FROM ABANDONED WIND TURBINES FOR REUSE IN HIGHER VALUE APPLICATIONS

## › Objective

- › test the feasibility of both thermal and solvo-chemical recycling methods for chopped wind turbine blades to recover both: (a) fiber fragments for re-use in short fiber reinforced products and (b) decomposition products

## › Approach/result

- › Representative chopped pieces of wind turbine blade composites will be subjected to tests in thermal and solvo-chemical recycling process equipment at laboratory or bench scale
- › A first process design will be made for an industrial scale facility and experimental results will be used as input for a techno-economical evaluation and impact assessment.



## › Needed: companies from the value chain

# SOLVO-CHEMICAL RECYCLING OF PVC TO ENABLE RE-USE OF POLYMER AND ADDITIVES

## › Objective

- › Solvo-chemical recycling with a single solvent.
- › Recovery of PVC polymer, plasticizers and mineral additives

## › Approach

- › Recovery of polymer by dissolution
- › Recovery of plasticizers by absorption
- › Recovery of mineral additives by filtration

## › Result

- › a conceptual process scheme
- › first estimates of processing cost and impact assessment

## › Needed: companies of the value chain



A nighttime photograph of a city street. In the foreground, a modern, curved pedestrian bridge with a glass railing is illuminated. The background shows a multi-story brick building on the left and a modern glass-walled building on the right. Long-exposure light trails in green and yellow are visible across the scene, suggesting traffic or light trails. The overall atmosphere is urban and modern.

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