

FUTUREPACK

Project Presentation to
“Forum for Fossilfri Plast” April 4th 2017

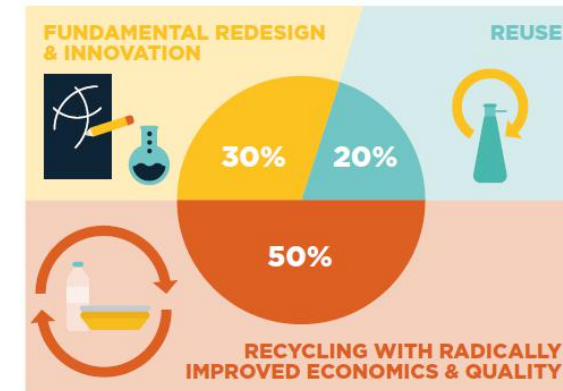
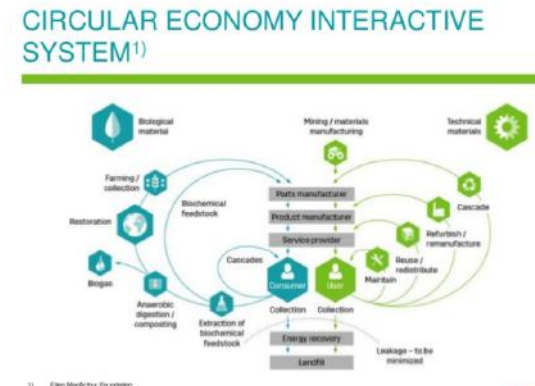
Jorunn Nilsen, Norner Researchas

PLASTICS IN THE CIRCULAR ECONOMY – MAIN PRINCIPLES

- Current main focus on plastics packaging
 - Packaging is 40 % of all plastics use in V-Europe
- Decouple plastics from fossil feedstock
- Reduce/eliminate material leakage from the value chain
- Material recycling is first priority
 - Feedstock/chemical recycling an option
- Focus on the large polymer types (e.g PE, PP,)



EU's Circular Economy package (2015)
http://ec.europa.eu/environment/circular-economy/index_en.htm#



2016 Rethinking the Future of Plastics 2017 The New Plastics Economy – Catalyzing actions
The Ellen MacArthur Foundation

FUTUREPACK, BACKGROUND

- Initiativ from Grønt Punkt Norge (GPN)
- Via Emballasjeforsk, GPN asked Norner, together with the other institutes, to develop a project proposal where the subject should be:
 - «Morgendagens emballasje i en sirkulær økonomi»
 - Norwegian biomass
 - Design for recycling
 - Dedicated industrial participants
- Strong consortium with industrial partners representing various parts of the value chain:

FUTUREPACK – FACTS & FIGURES

- Project name: Future Plastic Packaging in the Circular Economy
- Acronym: FuturePack
- Program: Brukerstyrt Innovasjonsarena BIA - Programme for *user-driven* research-based *Innovation*
- Project type: The Research Council of Norway – Knowledge-building Project for Industry (KPN)
- Project period: 2017 Q1 – 2020 Q4
- Project duration: 4 years
- Project budget: 26 MNOK
 - NRC: ~ 80 %
 - Industry: ~ 20 %
- Project consortium:
 - Industry and NGO's: 10 partners
 - R&D institutions: 5 partners
 - The Research Council of Norway



PROJECT OBJECTIVES

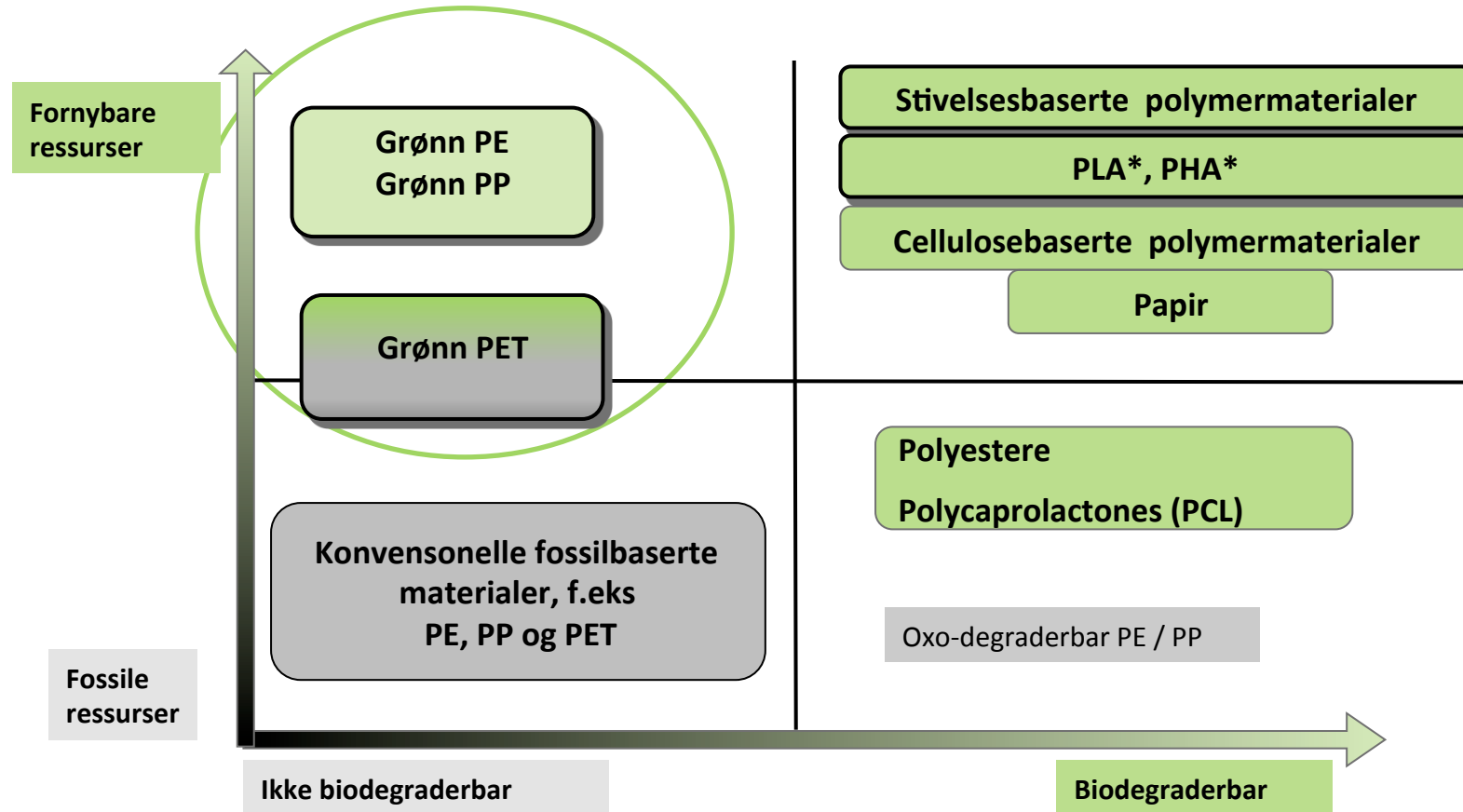
Primary Objective:

The FuturePack project will develop a *comprehensive knowledge platform* for the Norwegian production of *sustainable packaging materials* from *Norwegian biomass* and *polymer waste* resources, in accordance with the principles of *circular economy*.

Secondary Objectives

- SO1:** Evaluate the fit of Norwegian biomass and plastics waste resources for polymer production
- SO2:** Develop technology for cost-efficient conversion of biomass and plastics waste into building blocks for polymers
- SO3:** Demonstrate sustainable polymer production from biomass and recycled plastics
- SO4:** Develop smart and sustainable packaging design for improved material recycling
- SO5:** Develop sustainability assessments for bioplastic packaging concepts
- SO6:** Provide a knowledge platform with communication and networking tools

FUTUREPACK, POLYMER TYPES



*PLA = polylactic acid.

**PHA = polyhydroxyalkanoat

FUTUREPACK – PROJECT ORGANISATION

International
Advisory Board

Steering Committee

WP6

Project management & communication

WP1
Sustainable
raw materials

PFI, Norner, ØF, GPN,
Norgesgruppen, ROAF

Nova Inst. (DE)

WP2
Pyrolysis

PFI, NTNU, Norner

PhD/Postdoc, MSc, BSc

Univ. Aston (UK)

WP3
Polymer
production

Norner

MSc, BSc

WP4
Packaging design
for recycling

Nofima, Norner, Bama,
Bewi, Elopak, GPN,
Mills, Nortura, Orkla,
ROAF, Tine

Post doc, MSc

WP4
LCSA
Sustainability
assessment

ØF, all partners

MSc

IVL Swedish Environm. Inst.

FUTUREPACK – WP1 SUSTAINABLE RAW MATERIALS

FuturePack

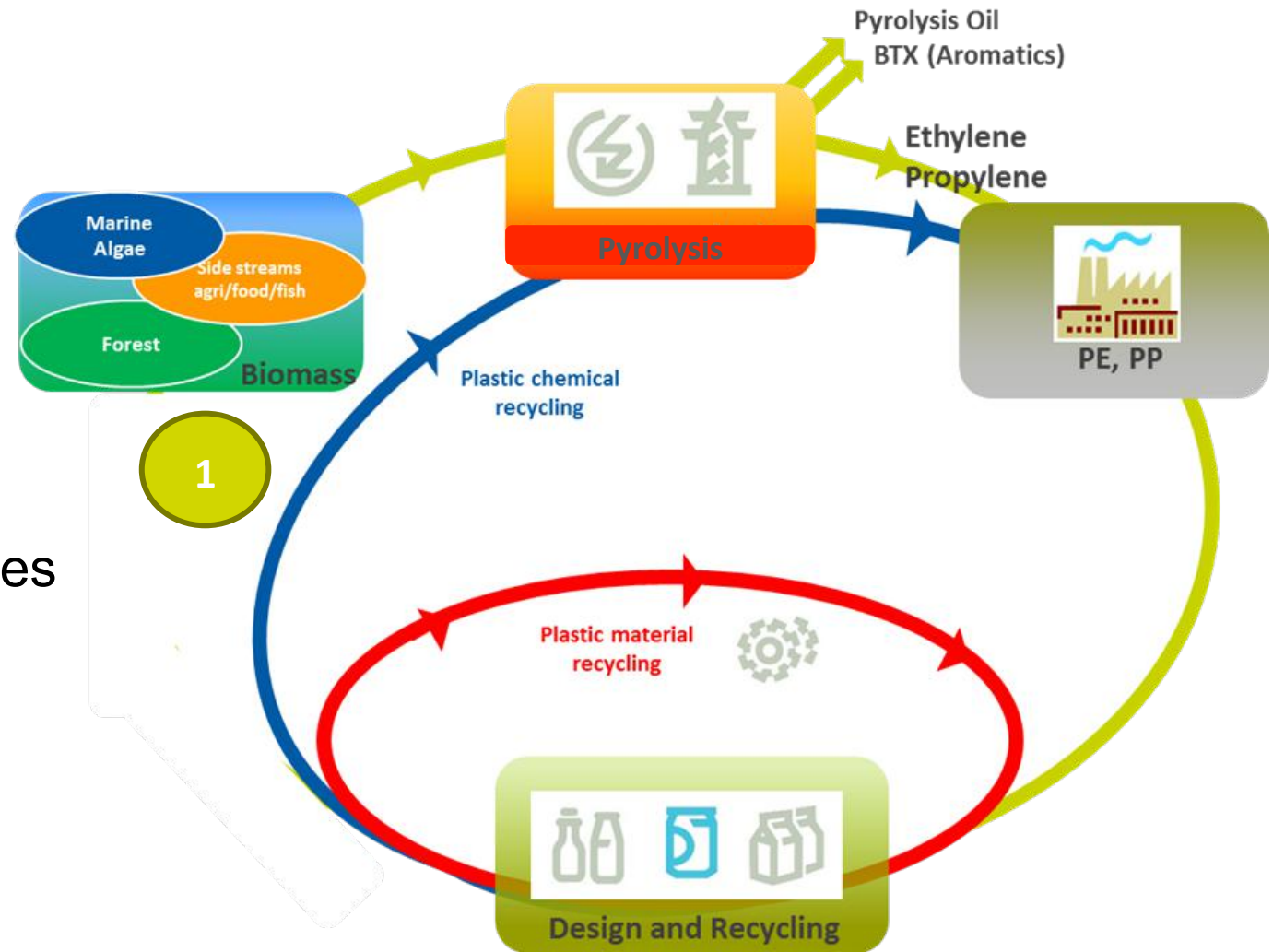
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Biobased feedstock (virgin)

- Norwegian resources
- Wood
- Marine
- Raw rest materials from industries

Multimaterial packaging (recycling)

- Materials with inseparable layers of different materials

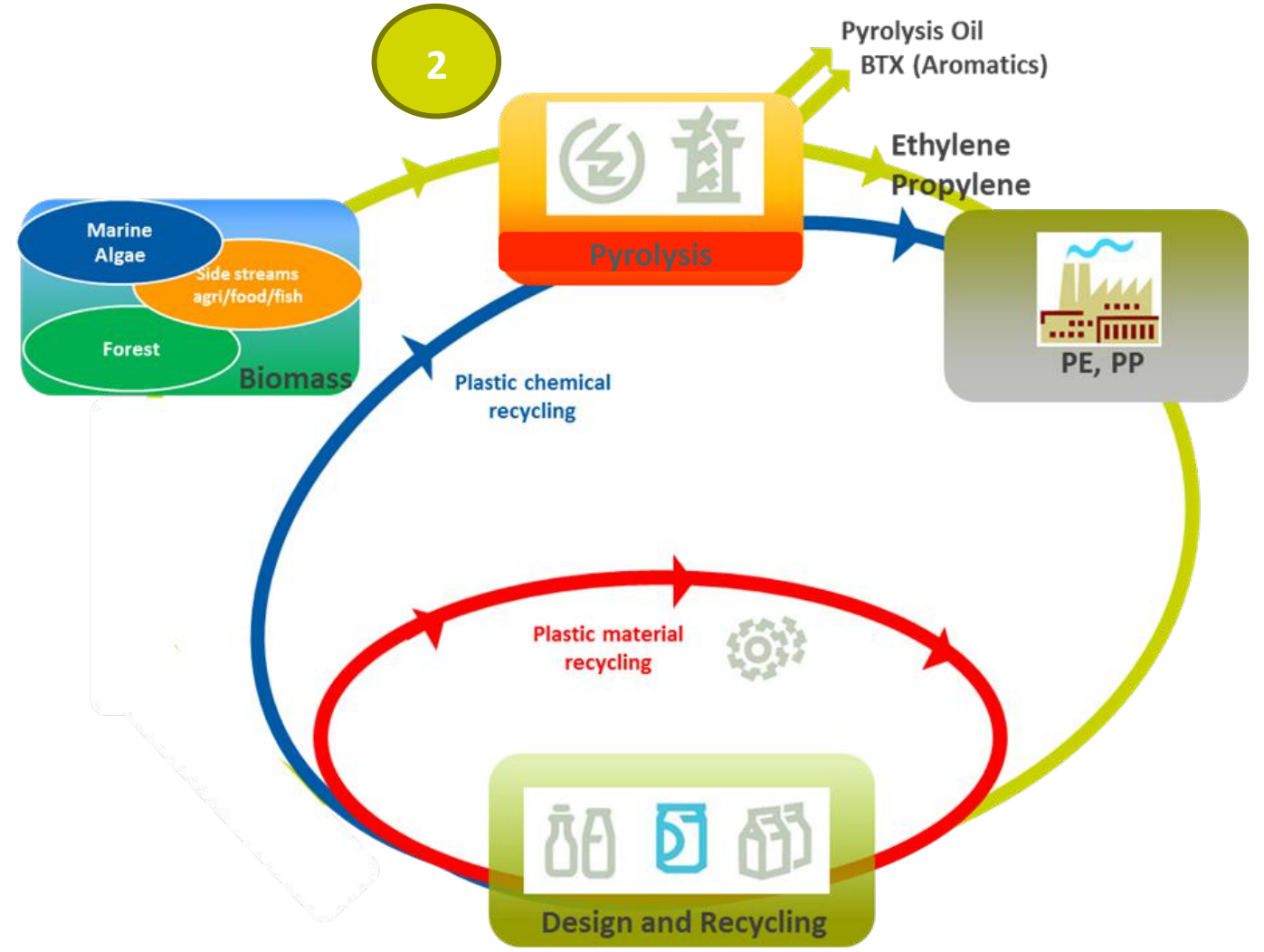


FUTUREPACK – WP2 CONVERSION OF BIOMASS AND PLASTICS WASTE

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Catalytic fast pyrolysis technology

- Biomass
- Plastic waste
- Co-pyrolysis of bio- and plastics
- Direct vapour upgrading



FUTUREPACK – WP3 POLYMER PRODUCTION

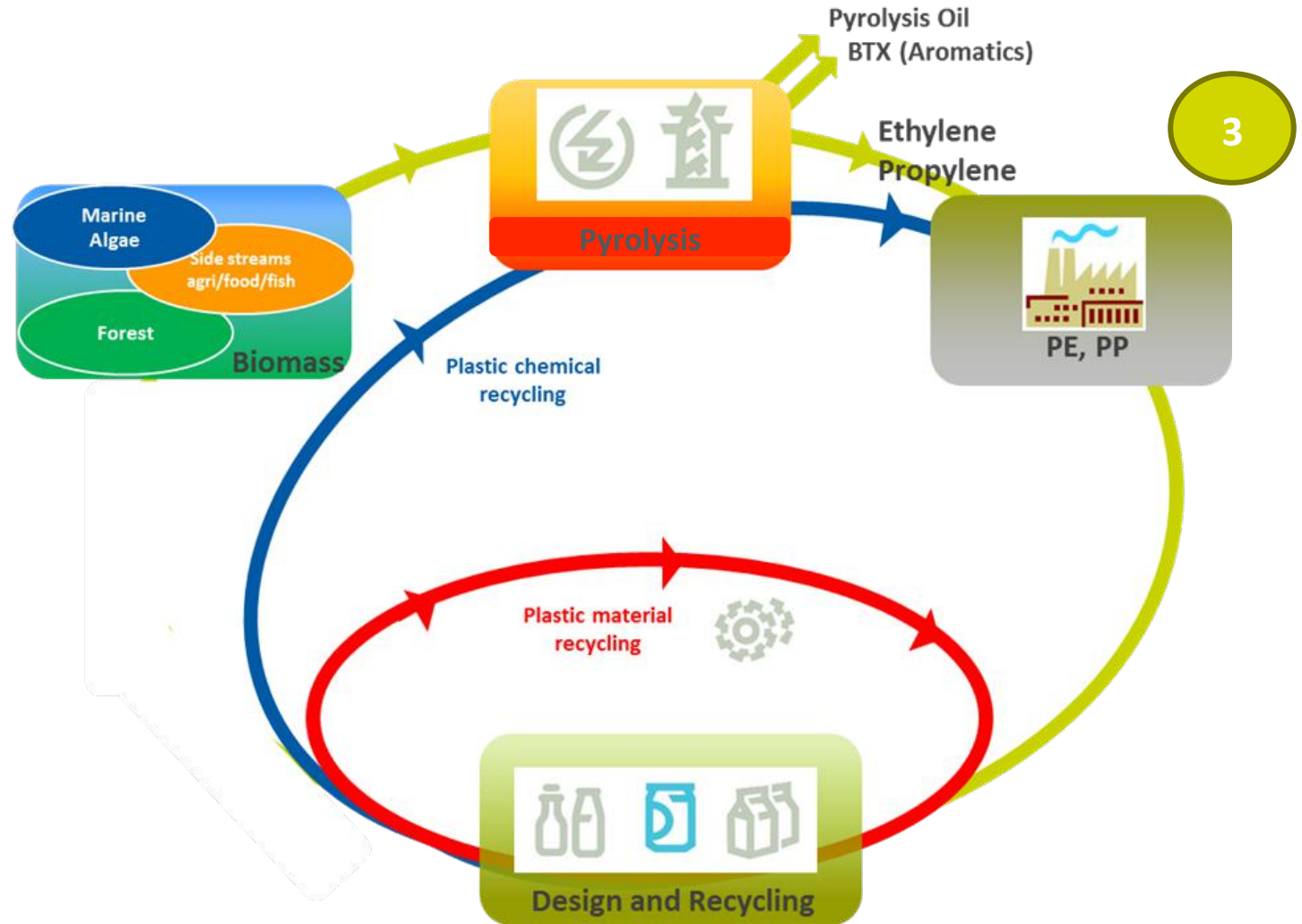
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Purification of ethylene and propylene

- New technology development

Polymerisation

- Green PE
- Green PP

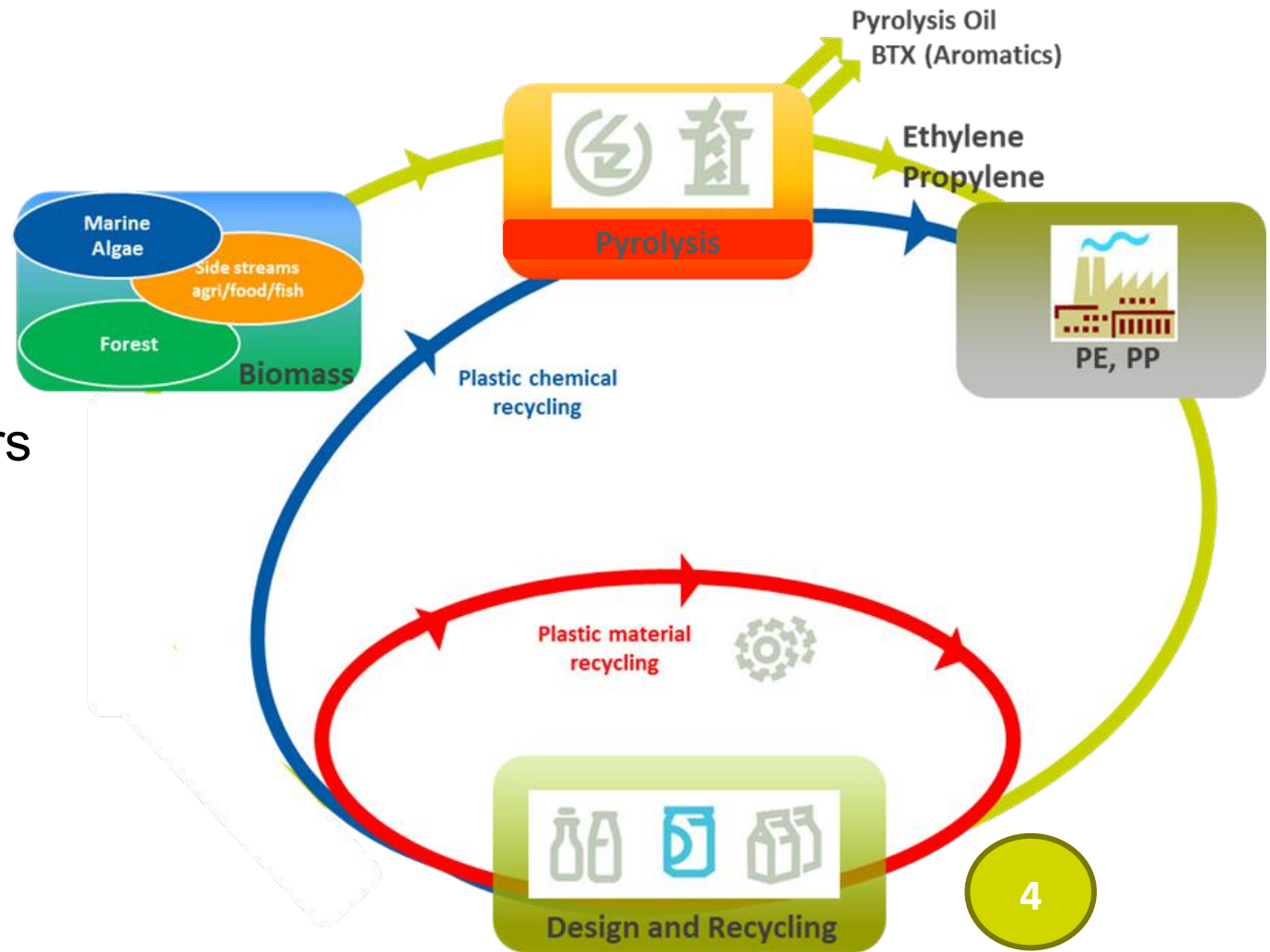


FUTUREPACK – WP4 PACKAGING DESIGN FOR RECYCLING

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Packaging design for recycling

- Case studies selected in co-operation with industrial partners
- Use of recycled materials with improved quality
- Monomaterials to replace laminates
 - in food packaging applications
 - in display packaging applications

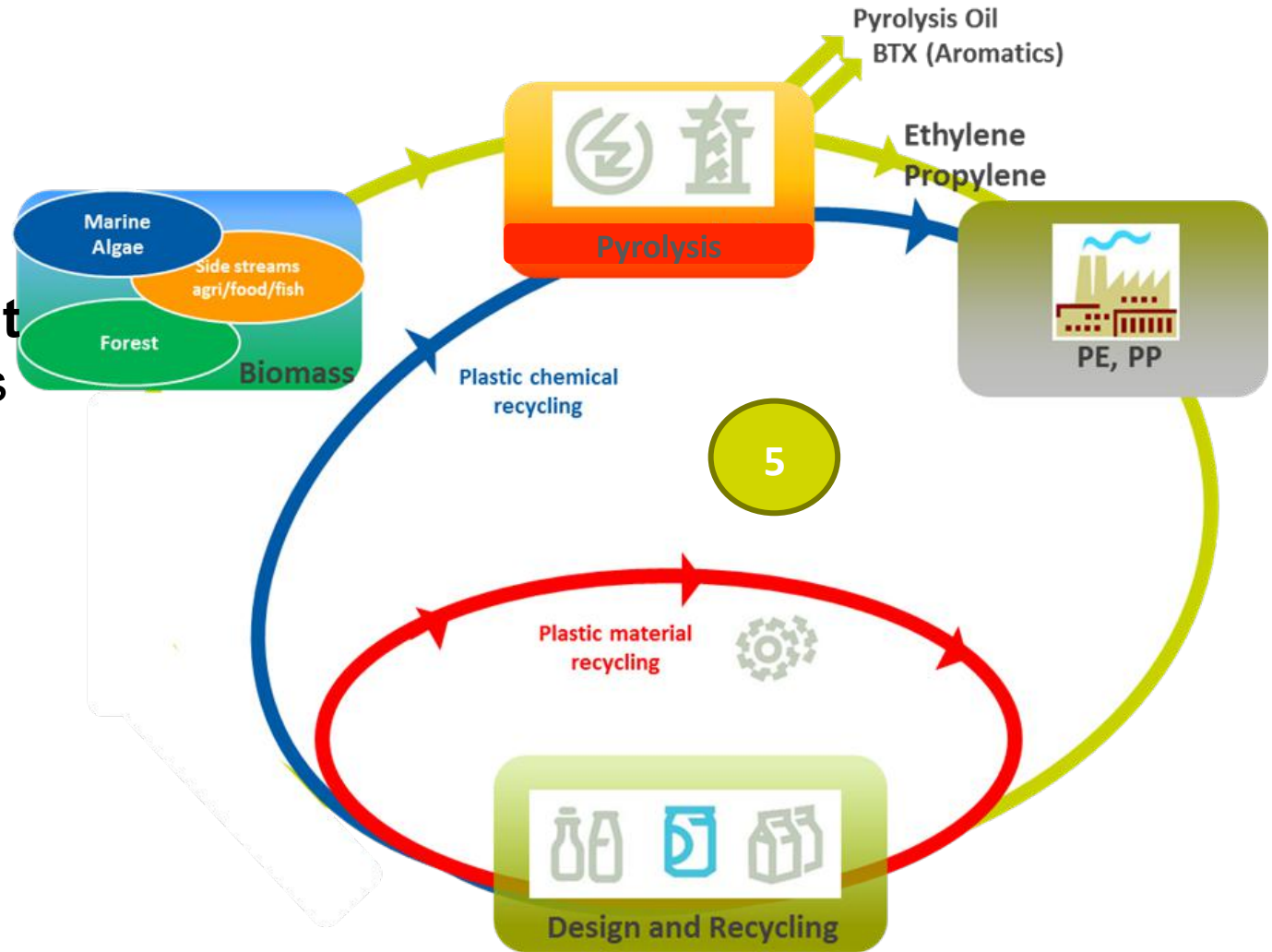


FUTUREPACK – WP5 LCSA SUSTAINABILITY ASSESSMENT

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LCSA Sustainability assessment

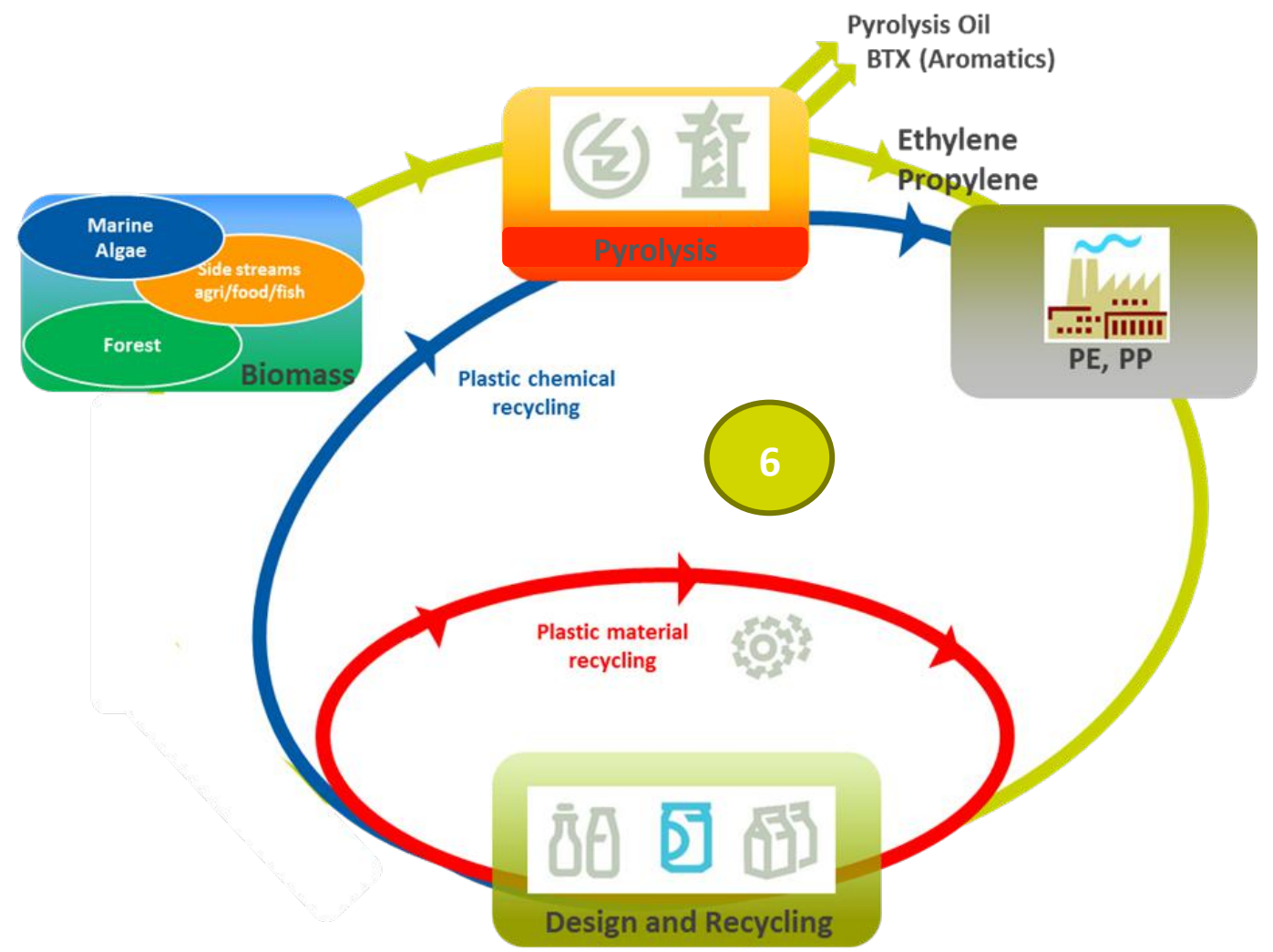
- Develop baseline LCSA models
- Update of models based on project results



FUTUREPACK – WP6 PROJECT MAN. AND COMMUNICATION FuturePack

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- Project management
- Communication platform
 - Internal
 - External

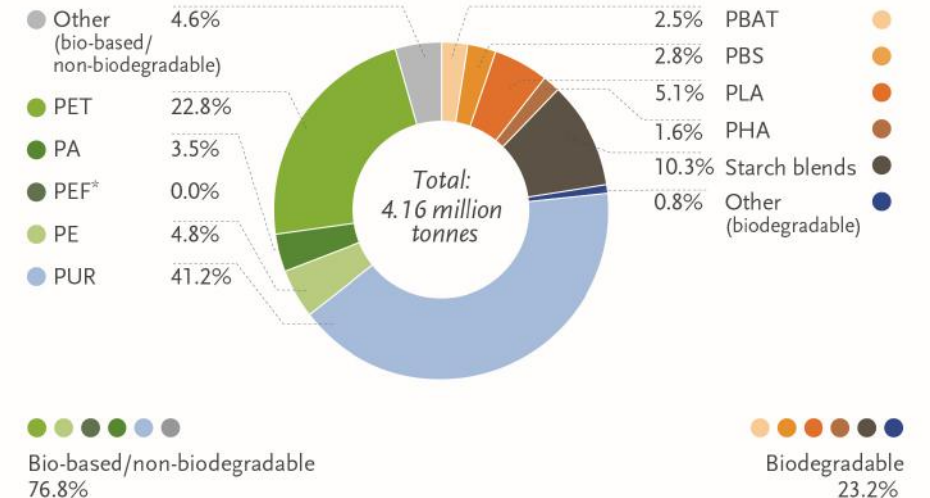


BIOPLAST – FREMTIDENS LØSNING!?



- Bioplast – en stor og uensartet gruppe polymerer
 - Biobasert, eller
 - Biodegraderbar, og
 - begge deler
- Hva slags polymerer?
 - Nye typer polymerer
 - Konvensjonelle polymerer i «bio-utgave»
- Bioplast for emballasje: **PE, PP**

Global production capacities of bioplastics 2016
(by material type)



*PEF is currently in development and predicted to be available in commercial scale in 2020.

Source: European Bioplastics, nova-Institute (2016).

More information: www.bio-based.eu/markets and www.european-bioplastics.org/market

Source: Plastics Europe Plastics the Facts 2016