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Integrating CO₂ in the value chain

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The role of Horizon 2020

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Horizon 2020: Key elements

- A single programme with three pillars: **societal challenges, industrial competitiveness and excellence in science**
- More emphasis on **innovation**
- More involvement of industry via the **industrial deployment of key enabling technologies**, and through **PPPs** - institutionalised and contractual
- **Simplified access** for all stakeholders

Horizon 2020 - LEIT:

"Leadership in Enabling and Industrial Technologies" promotes greater involvement of industry

- To enhance **synergies between research and industry**
- **Strategic research and innovation agendas** defined by industry and business, together with the research community
- With a strong focus on **leveraging private sector investment**
- **SME targeted activities**: integrated approach and SME Instrument
- **PPPs are used for the implementation of KETs** in the Factories of the Future, Energy-efficient Buildings & Sustainable Process Industry

PPPs in Horizon 2020

Institutionalised PPPs

- Innovative Medicines (IMI)
- Clean Sky
- Single European Sky ATM Research (SESAR)
- Fuel Cells and Hydrogen (FCH)
- Electronic Components and Systems (ECSEL - old ARTEMIS + ENIAC)

New:

- Bio-based Industries (BBI)
- Shift2Rail

Contractual PPPs

- Factory of the Future (FoF)
- Energy-efficient Buildings (EeB)
- Green Vehicles (EGVI)
- Future internet (5G)

New:

- **Sustainable Process Industry (SPIRE)**
- Robotics
- Photonics
- High Performance Computing
- Big Data

The future of processing



Resource Efficiency in the whole production process

Input



Output

Process

ENERGY

RAW MATERIAL

Solvents,
Catalysts &
Auxiliaries

WATER

PACKAGING

CO₂

PRODUCTS

By-products

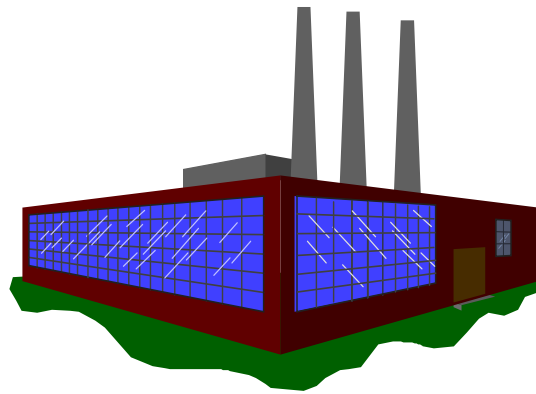
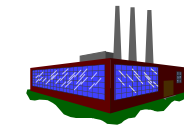
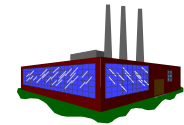
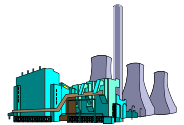
Residues

WASTE
WATER

Landfill
Waste

Gaseous
Emissions

Recycling

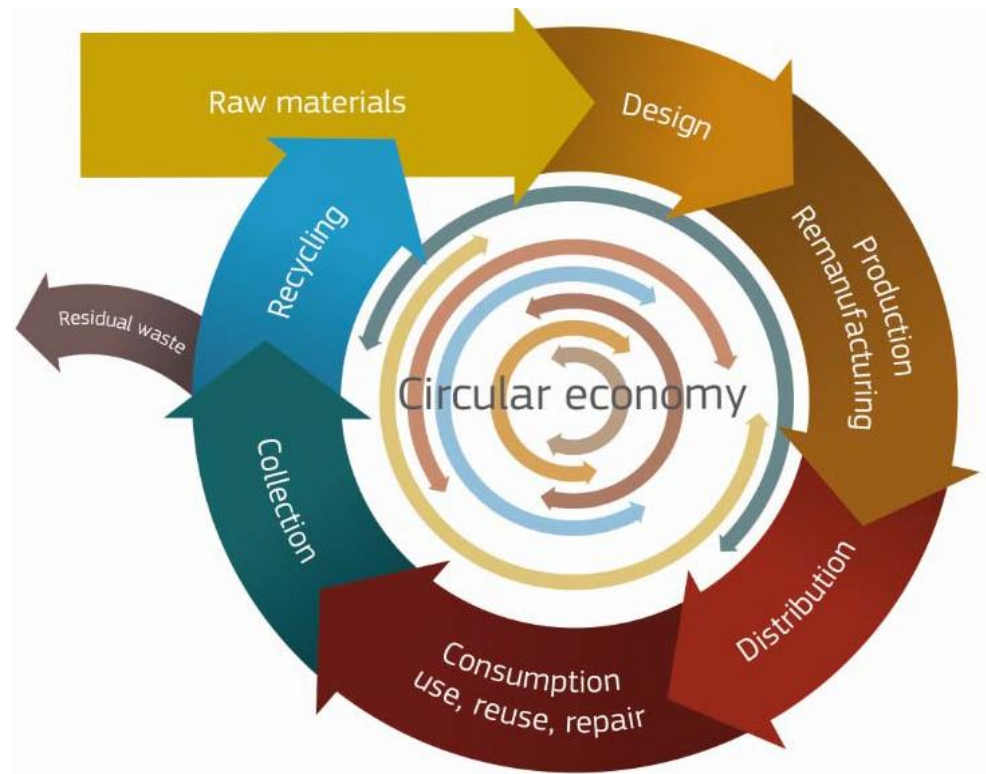




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CIRCULAR ECONOMY

- no longer linear
- extended life time
- collaborative approach
- cross-sectors
- multi-stakeholders
- innovation in all forms
- design strategies
- new business models
- demand-side measures
- etc...



Running LEIT-NMBP projects related to CO₂ utilisation in FP7 and Horizon 2020

- **Eco2CO2:** Eco-friendly bio-refinery fine chemicals from CO₂ photo-catalytic reduction
Started 1-12-2012 (42 months): EU contribution is 3.4 M€
- **CyclicCO2:** Production of Cyclic Carbonates from CO₂ using Renewable Feedstocks
Started 1-1-2013 (48 months): EU contribution is 3.9 M€
- **MethCO2:** Synthesis of methanol from captured carbon dioxide using surplus electricity
Started 1-12-2014 (48 months): EU contribution is 8.6 M€

Future LEIT-NMBP call topics on CO₂ utilisation under consideration within Horizon 2020

- Use of CO₂ as feedstock for the process industry
SPIRE – CSA – 2016
- CO₂ utilisation for value added chemicals
SPIRE – RIA – 2017
- Microbial platforms for CO₂ - reuse processes
Biotechnology – RIA – 2017



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New Industrial Technologies in a Circular Economy require R & I investments

CIRCULAR ECONOMY in HORIZON 2016-2017



Funding opportunities beyond HORIZON 2020

- Private funds
- Structural funds
- EIB
- etc.



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Towards a GLOBAL IMPACT





**Thank you
for your attention!**

Find out more:

www.ec.europa.eu/research/horizon2020