



# TÜV SÜD als Partner im COMET

Branchentag Wasserstoff  
Wien

**Add value.  
Inspire trust.**



# TÜV SÜD at a glance



**15,000+**

technical  
experts



**150+**

years of safety,  
security & sustainability



**1,000+**

locations  
worldwide



**26,000+**

TÜV SÜD  
employees



**€2.9**

billion in  
annual revenue



**100 %**

independent  
& impartial

TÜV SÜD global experts are committed to helping you manage risks and access global markets through a comprehensive portfolio of technical solutions

# Ensuring safety and efficiency along the H<sub>2</sub> value chain

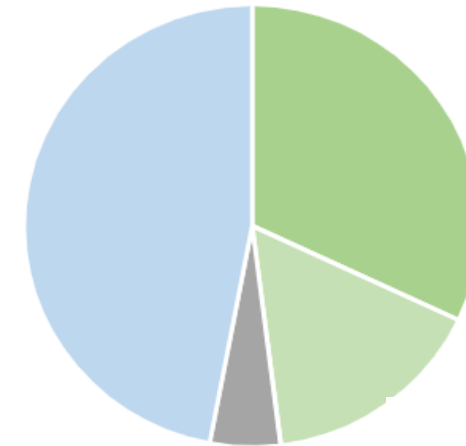


Feasibility & management	Technical due diligence of the PtX-plant with electrolyser system & project rating		
	Global Supply Chain requirements management		
Engineering	Material & component compatibility as certification body (TS standard)		
	HAZOP, safety concept & certification concept		
Construction & Commissioning	ELY stack and system certification (e.g. CE, ISO 22734)	Plant safety, pipeline and gas system qualification	
	Electrolysis plant safety <ul style="list-style-type: none"> <li>- Approval with authorities</li> <li>- conformity assessment (e.g. CE)</li> <li>- accredited expert services for plant</li> <li>- assembly commissioning</li> </ul>		Component, fuel cell and electrolyser qualification as TS & CB
Operation	Inspection, Functional Safety testing, NDT		

Staff training



19,71 M€ Budget for 4 years



■ Federal funding ■ Provincial funding ■ Scientific partners ■ Company partners

# Research Areas along the Entire Value Chain

The three distinguished technological areas and one cross-cutting area are closely linked and essential parts of the entire value chain research.

## RESEARCH AREAS HYCENTA



**Areas** include **all steps** along the **value chain**, from production to distribution and followed by applications

### HyCentA K1 COMET Centre

#### Area 1 Electrolysis and Power-to-X

Material research, new electrolysis technologies, alternative processes (from materials to industrial applications)

#### Area 2 Green Energy and Industry

Storage and distribution (gas storage, hydrides etc.), electrochemical compression, stationary fuel cells, safety

#### Area 3 Green Mobility

Fuel cell research on materials, cell, stack and system; optimisation of entire powertrain system including hydrogen storage

#### Area 4 Circularity and System Optimisation

Measurement and testing technologies, controls, diagnostics, modelling and simulation "digital twin"

# Innovation and Entrepreneurship



We support you along the entire project lifecycle ...

I

## Stack Level

Certification of the components and materials



II

## System Level

Ensuring functional safety and performance



III

## Electrolyser Plant Level

Safety and compliance from planning to operation



IV

## Supply Chain Assessment

Supplier assessment and product specification management - to ensure quality, compliance to regulation with global supply chain

# „The hydrogen economy should not get stuck in the middle“

## Arguments against Hydrogen

- „Hydrogen cannot be stored.“
- „Hydrogen cannot be transported.“
- „Hydrogen is extremely dangerous.“
- „Hydrogen needs to be compressed and this is inefficient.“
- „Hydrogen needs to be extremely pure for utilization.“
- „Production and utilization ramp-up is not synchronized.“

## Facts

- „Hydrogen is used and stored as technical/industrial gas since decades.“
- „Hydrogen is transported in trailers and pipelines since decades.“
- „120 Mio t/y are handled every year.“
- „Costs and energy consumption of H2 compression is below 10% of the total.“
- „Only for FC, high purity is necessary, not as energy gas.“
- „Production and utilization on one site.“



### Passenger cars

- UNECE R134 (EU)
- GTR #13 (UN)
- HGV 2 (USA)
- SAE J2579 (USA)
- KHK S0128 (JP)
- EIHP (EU)
- ISO 19881 (internat.)



### Heavy duty vehicles

- UNECE R134 (EU)
- HGV 2 (USA)



### Transport

- Transportable Pressure Equipment Directive – TPED (EU)
- ADR (Europe, internat.)
- EN 12245 (EU)



### Stationary storage

- DGRL/PED (EU)
- ISO 19884 (internat.)
- EN 17533 (EU)



### Materials

- ISO 11114 (internat.)
- ASTM F519 (USA)
- ASTM F1624 (USA)
- ASTM G142 (USA)
- ASME B31.12 (USA)
- ...



THERE'S NO  
PLANET B

The sign features a hand-drawn illustration of the Earth in the center, with green continents and blue oceans. The text 'THERE'S NO' is arched above the globe, and 'PLANET B' is arched below it. The entire sign is made of brown cardboard and is held by a person's hand.

Challenge:  
Producing and using  
sustainable goods  
will be the license to  
operate now and in  
the future.

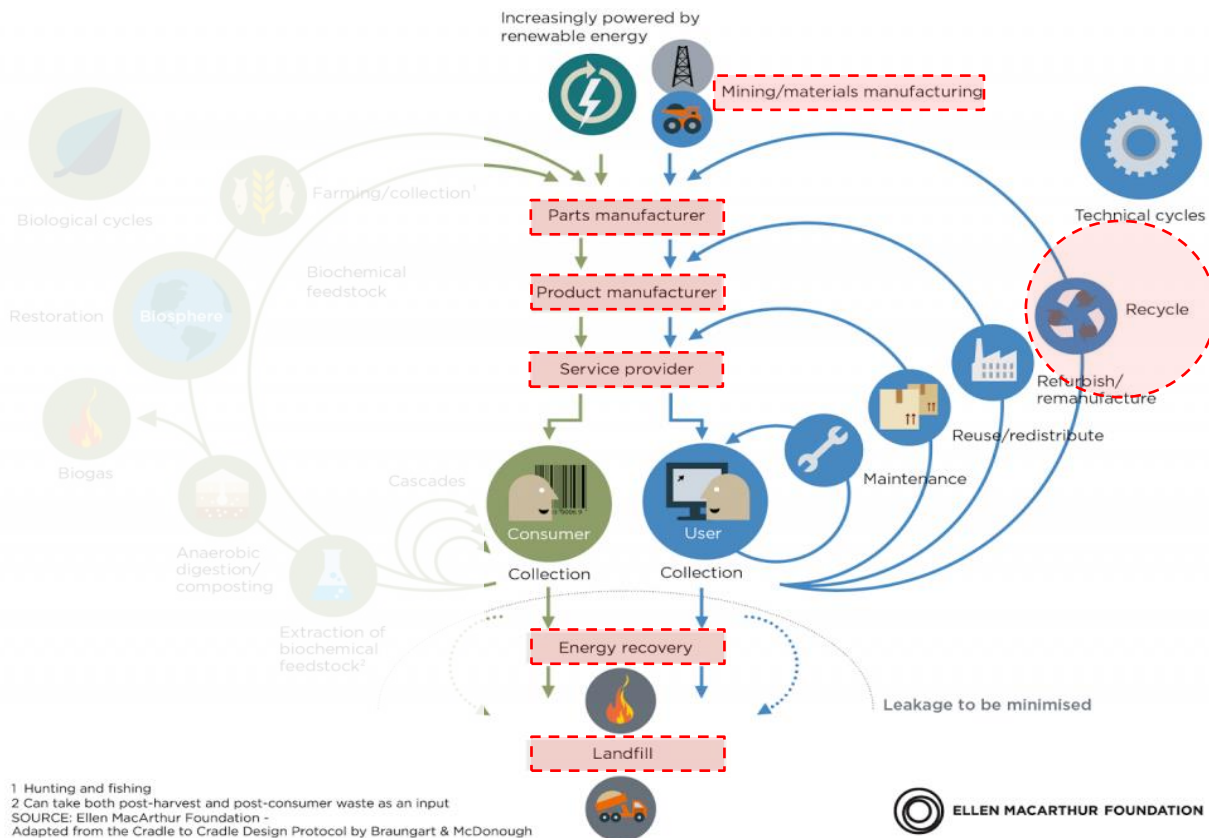


# Circular supply chains



## Consideration of circular economy principles and sustainability

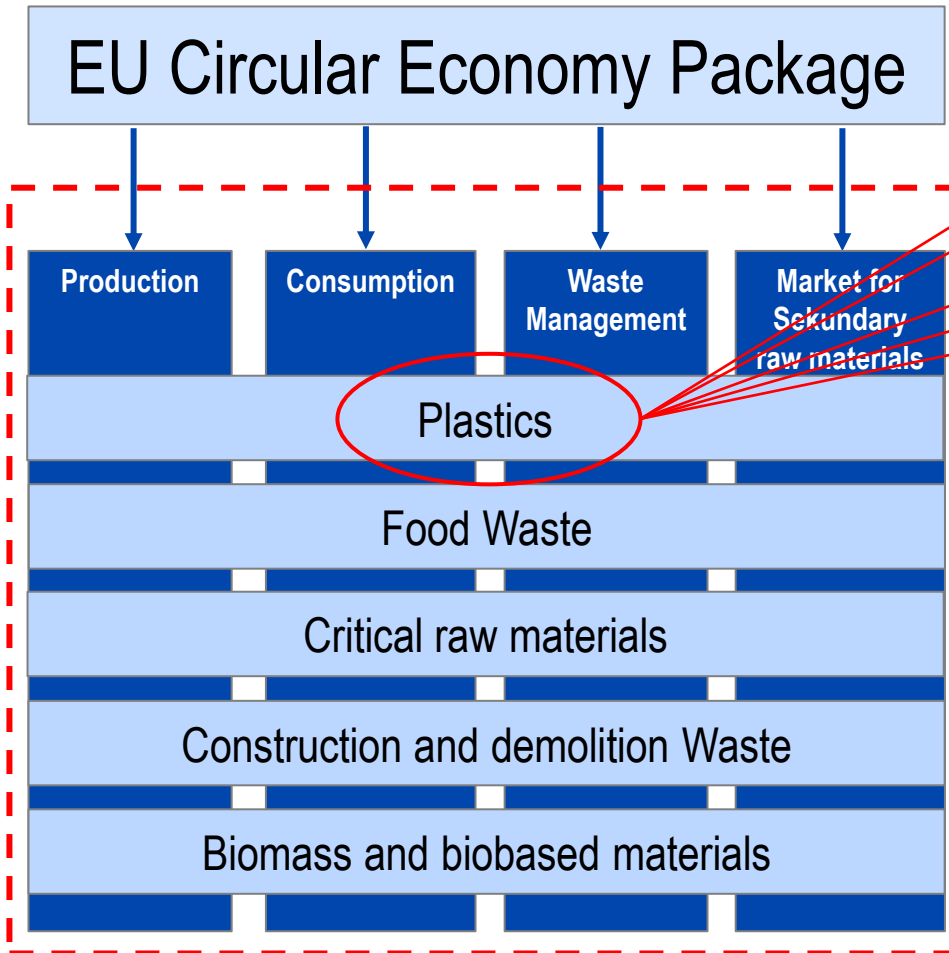
CIRCULAR ECONOMY - an industrial system that is restorative by design



# EU Circular Economy Package

- EU-Ökodesign directive
- Directive on electrical and electronic waste
- Directive on batteries and accumulators

- Directive on Landfill
- Directive on Packaging Waste
- Directive on end-of-life Vehicles
- Directive on Waste
- EU Strategy for Plastics in the Circular Economy
- Directive on Single-Use-Plastic



Specific targets for packaging recycling rates		
	til 2025	Til 2030
All packages	65%	70%
<b>Plastics</b>	50%	55%
Wood	25%	30%
Ferrous metals	70%	80%
Aluminium	50%	60%
Glass	70%	75%
Paper and cardboard	75%	85%



# Danke!

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It's time for the next level...  
... now, together!

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