

# “Distributed Chemicals and Fuels Production from CO<sub>2</sub> in Photo-electrocatalytic Devices (DECADE) project”

## *Market Assessment and Social Impact Analysis*

Tommaso Francese, Ph.D.

### Tech Transfer



Research  
contracts

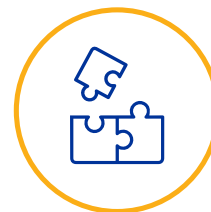


Innovation  
consulting



IP licensing and  
valorization

### Stakeholders & Ecosystem



Community



EU projects  
development  
& management

### Academy



Post lauream and  
Lifelong learning



Talent  
engagement

### Communication & Events



RIA – Research and Innovation Action



DECAD

Grant agreement ID: 862030



DOI

[10.3030/862030](https://doi.org/10.3030/862030)

EC signature date

8 April 2020

Start date

1 May 2020

End date

31 October 2024

Funded under

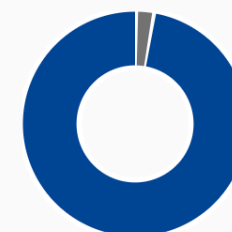
INDUSTRIAL LEADERSHIP - Leadership in enabling  
and industrial technologies - Advanced materials

Total cost

€ 5 358 672,49

EU contribution

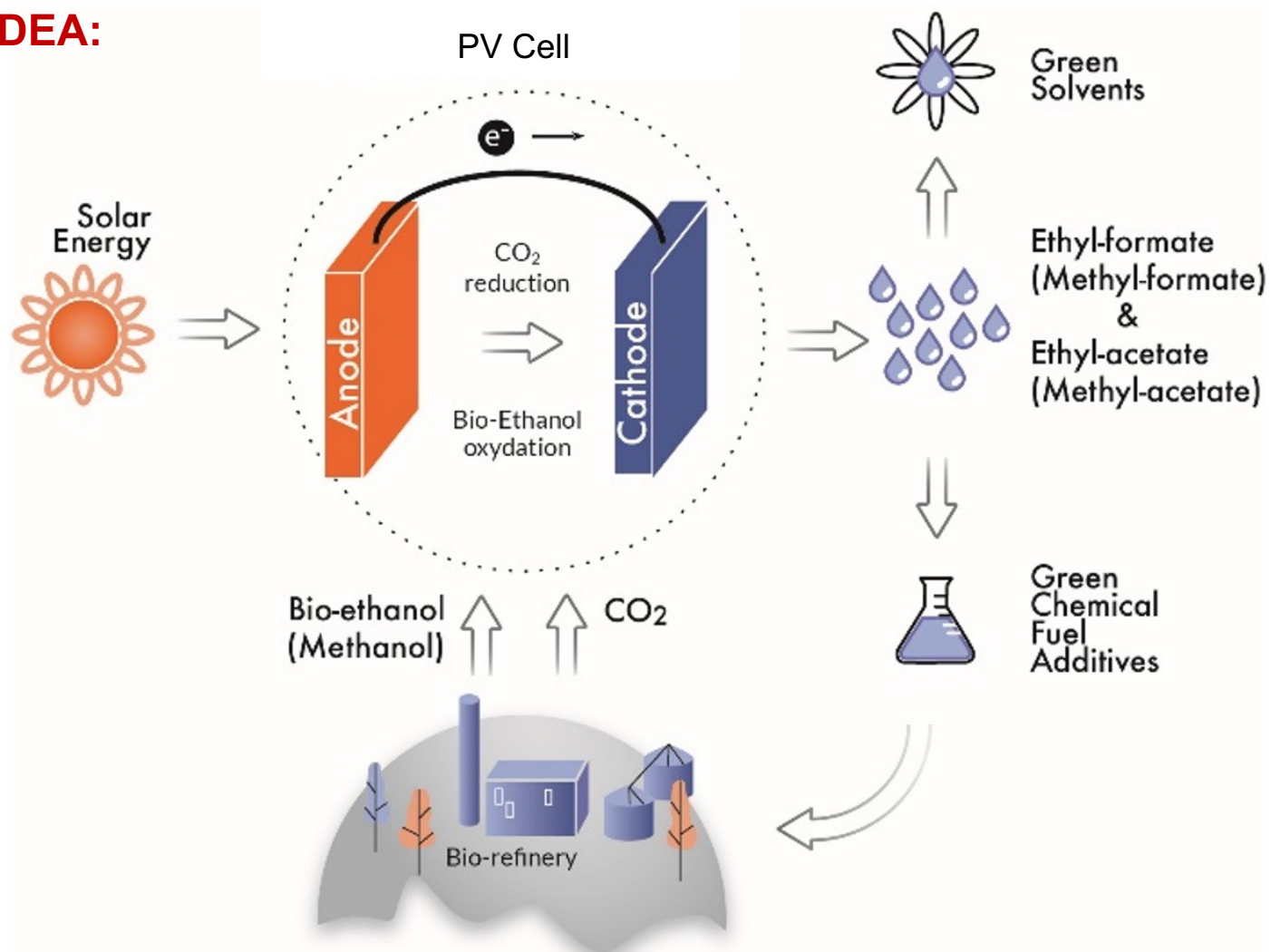
€ 5 198 756,69



Coordinated by

European Research Institute of Catalysis A.I.S.B.L.

 Belgium

**IDEA:****MAIN GOAL:**

- Production of chemicals and fuels from CO<sub>2</sub>, H<sub>2</sub>O and  $h\nu$

**POTENTIAL BENEFITS:**

- Use of CO<sub>2</sub> as raw carbon source
- Use of "free" energy source
- Increment of the circularity & reduction of the carbon footprint

**INTRINSIC CHALLENGES:**

- avoid H<sub>2</sub>O oxidation as anodic reaction
- exploit bio-alcohols and waste CO<sub>2</sub> as feed to generate value-added products
- target products: ethyl (methyl) acetate and ethyl (methyl) formate



European  
Commission

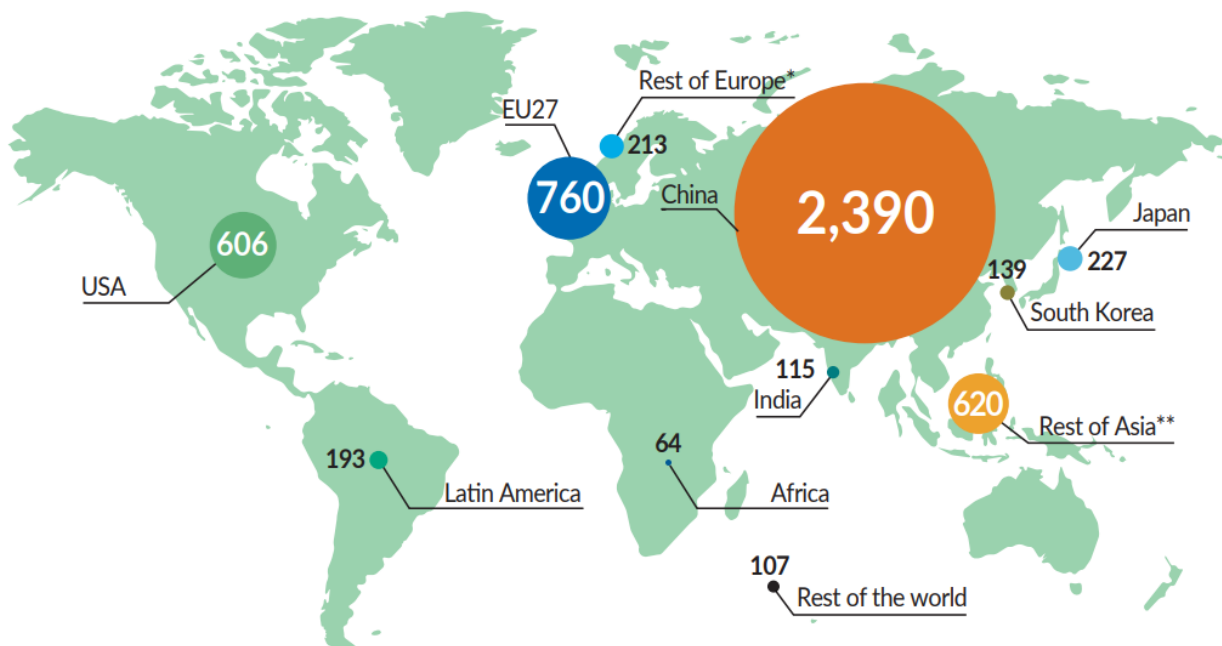


CORDIS  
EU research results



UniMART  
Fondazione Università di Padova

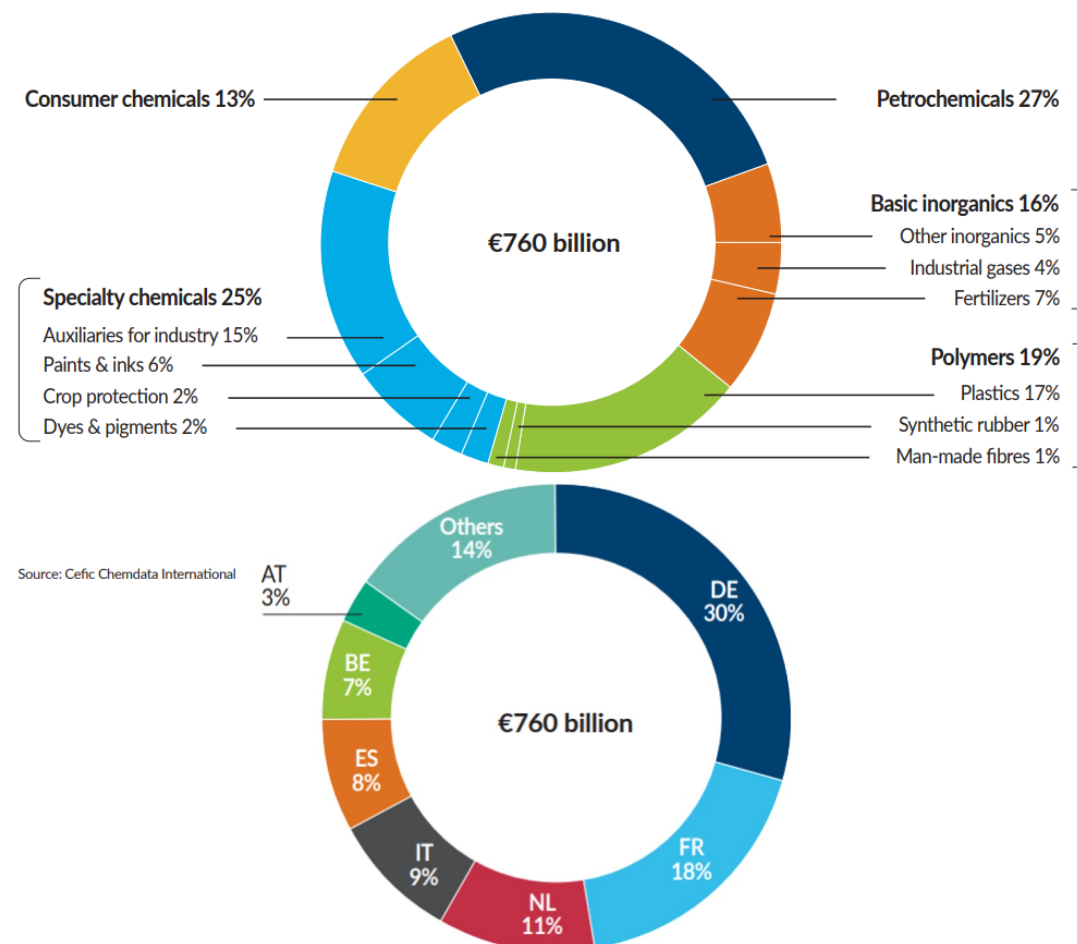
*Europe represents the second-largest chemical producer in the world*



Source: Cefic Chemdata International

\*Rest of Europe covers UK, Switzerland, Norway, Turkey, Russia and Ukraine

\*\*Asia excluding China, India, Japan and South Korea



Source: Cefic Chemdata International





European  
Commission

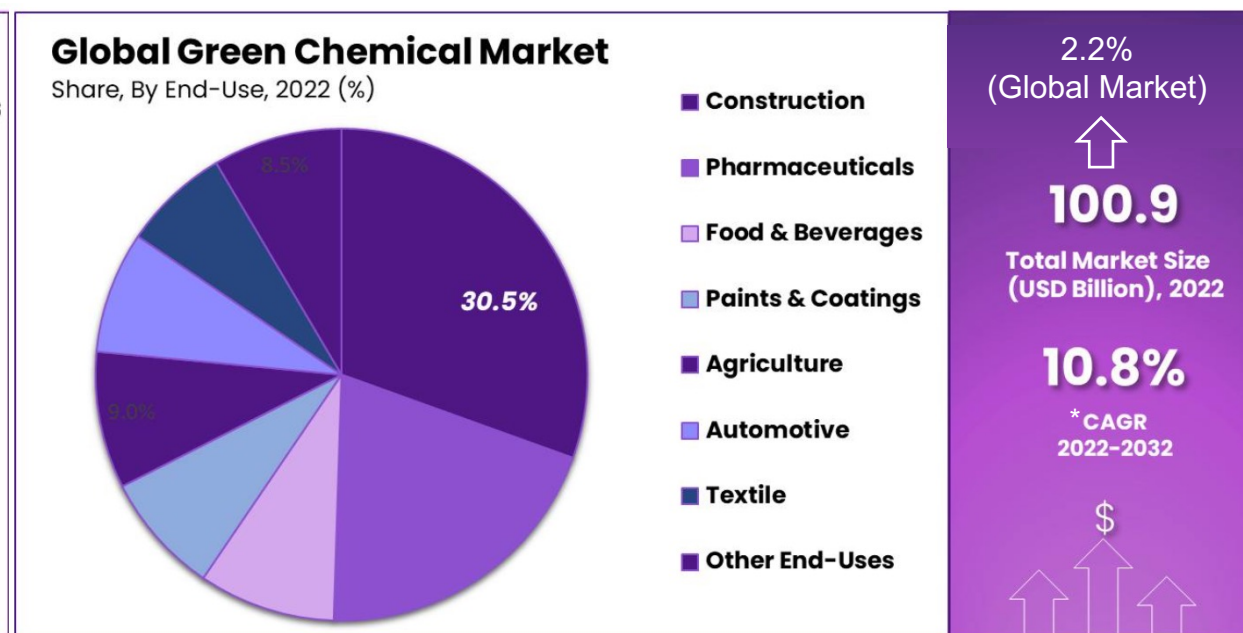
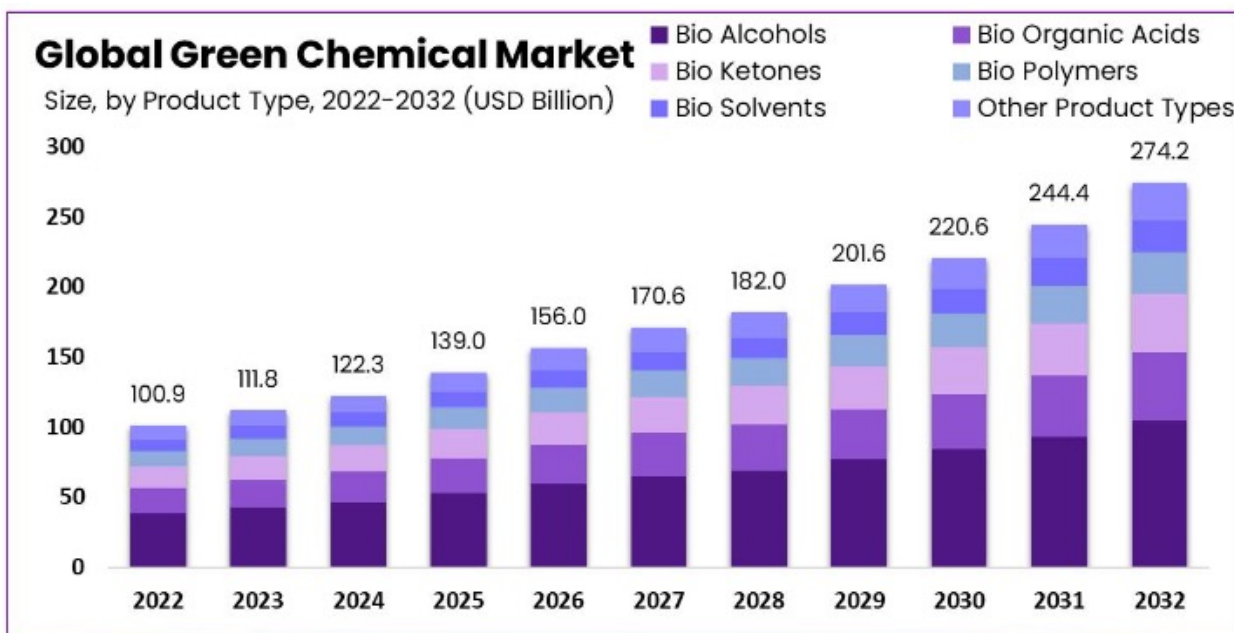


**CORDIS**  
EU research results



**UniMART**  
Fondazione Università di Padova

## *The Green chemical market*



Source: market.us

\*Compound Annual Growth Rate



European  
Commission



**CORDIS**  
EU research results



**UniMART**  
Fondazione Università di Padova





## *The Green chemical market*

	Market Size	Expected Market Growth	Major Players & Categories	Regions
<b>Ethyl Acetate</b>	\$4.7 billion <sup>1</sup> (2020)	+8.8% (2021-2028) <sup>1</sup>	<ul style="list-style-type: none"> <li>➤ Paints and Coatings</li> <li>➤ Pharmaceuticals</li> <li>➤ Artificial Leather</li> <li>➤ Food and Beverage Packaging<sup>1,2</sup></li> </ul>	Asia-Pacific North America Europe <sup>1,2</sup>
<b>Methyl Formate</b>	\$7.1 billion <sup>3</sup> (2020)	+5.7% (2022-2028) <sup>3</sup>	<ul style="list-style-type: none"> <li>➤ Formic Acid (&amp; derivatives)               <ul style="list-style-type: none"> <li>➤ Pharmaceuticals</li> <li>➤ Agrochemicals</li> </ul> </li> <li>➤ Flavors and Fragrances<sup>3,4</sup></li> </ul>	Asia-Pacific North America Europe <sup>3,4</sup>

1. [Green Solvents Market Size Worth \\$3.46 Billion By 2030](#)
2. [Green & Bio-Solvents Market Size – Market&Markets](#)
3. [Green/Bio-based Solvents Market Size – Forecast 2030](#)
4. [Green Solvents Market Size and Gross Margin: Latest Insights](#)

## How to choose the right market for the DECADE products?

**STRENGTHS:**  
*internal assignments  
that constitute a  
source of advantage*

 <ul style="list-style-type: none"><li>• Sector of high strategic importance</li><li>• <u>Big players with big investment capacity</u></li><li>• Close relations with research centres and universities</li><li>• Government and community programmes for market development</li><li>• Great awareness of the theme</li></ul>	 <ul style="list-style-type: none"><li>• <u>High research and development costs</u></li><li>• Need to change the nature of raw materials and modify production methods</li><li>• High energy costs</li><li>• <u>Dependency on the global supply chain</u></li></ul>
 <ul style="list-style-type: none"><li>• New sustainable products and made from renewable raw materials</li><li>• <u>High market growth</u></li><li>• Rapid growth of the green chemicals market</li><li>• Increased use of industry 4.0 technologies</li></ul>	 <ul style="list-style-type: none"><li>• Commodity price volatility</li><li>• Exchange rate</li><li>• <u>Failure in research and development processes</u></li><li>• Possible legislative limitations</li></ul>

**OPPORTUNITIES:**  
*external conditions  
that are positive*

**WEAKNESSES:**  
*internal allocations  
that constitute a  
source of  
disadvantage*

**THREATS:**  
*conditions that could  
have negative effects*





European  
Commission

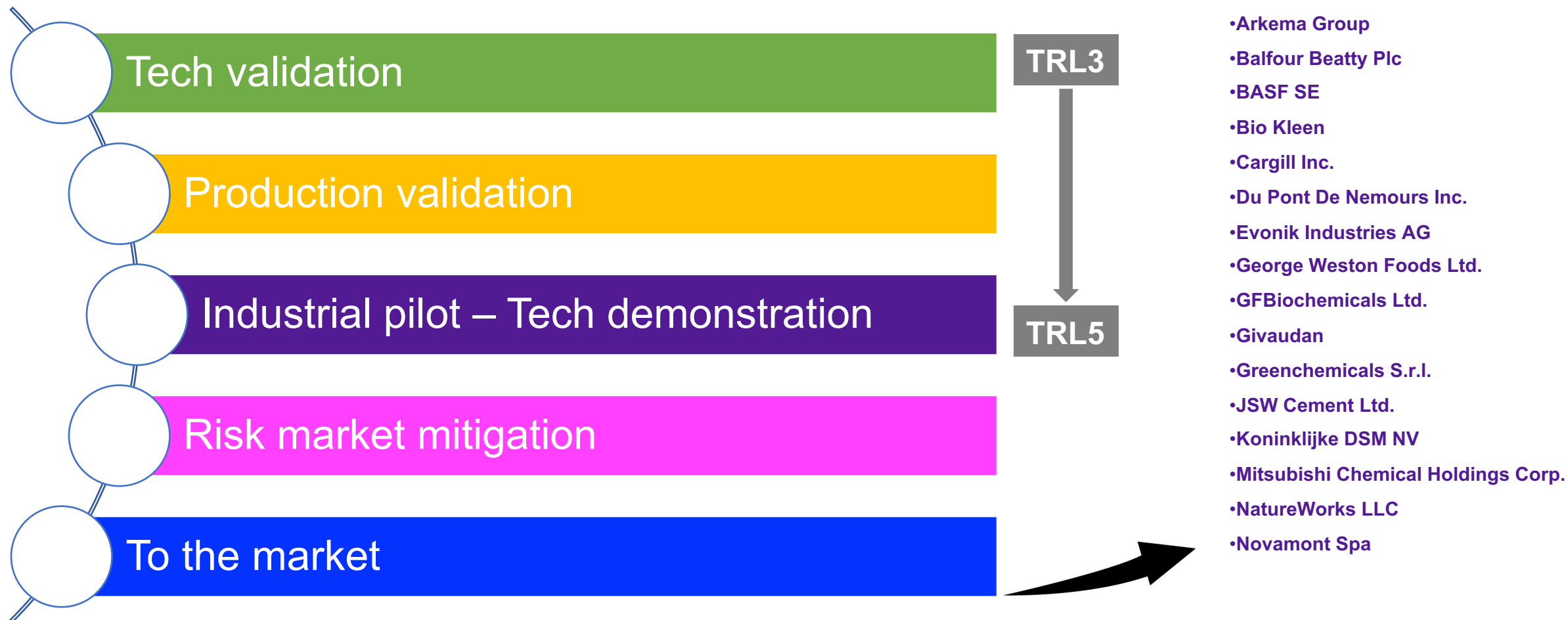


**CORDIS**  
EU research results



**UniMART**  
Fondazione Università di Padova

Next actions from DECADE partners:





European  
Commission



CORDIS  
EU research results



Uni/MART  
Fondazione Università di Padova

## *Market Assessment and Social Impact Analysis*





European  
Commission



CORDIS  
EU research results



Uni/MART  
Fondazione Università di Padova

***THANKS FOR THE ATTENTION***