

# Decarbonisation innovations database

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## Deliverable 2.1

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[This is a revised version based on the feedback from the midterm review report]



# Introduction

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The following database consists of 109 leading global innovations in the plastics, paper, steel, and meat & dairy sectors, helping these industries move towards decarbonisation. These cases cover technical, social, economic or institutional innovations that reduce the carbon intensiveness of at least one of these four industries. The innovations showcased are relatively new, yet already up and running, and highlight how carbon reduction activities are being integrated throughout the value chain – covering production, consumption, waste/recycling and finance. The type of information gathered about each case relates to the innovation's development, the actors behind the innovation, its decarbonisation potential, how it is financed, as well as information relating to the drivers of the innovation and its social, economic and environmental co-benefits and/or disadvantages.

Selection of cases involved a three-step process. First, an interdisciplinary team of researchers from all partner universities took part in identifying and vetting innovations, drawing on industry expertise and extensive desktop research. In order to compile the needed information for an entry, different sources were consulted, from webpages of the focal actors, to industry journals, public media, forums, campaigns, existing climate innovation databases, etc. This was complemented by a case by case review by all researchers at a partner meeting in 2017, at which a shortlist selection was made. This list was presented to industry-specific advisory boards who offered their insight and expertise, upon which the final selection of innovations was made.

The Decarbonisation Innovations Database is available online, as an Excel file, on Zenodo platform, in line with REINVENT's commitment to Horizon 2020's Open Data Pilot in Open Research Data (see D8.2 Data Management Plan):

Links to the database:

- Zenodo: <https://zenodo.org/record/1284945#.WzP7mtNuY1g>
- DOI: <https://doi.org/10.5281/zenodo.1284945>

Below is the full overview of information recorded for each database entry.

The full database is also attached as an Appendix to this document.

## Database entries

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Question	Template response	Explanation/comment
1. Locating the innovation		
Paper value chain	Yes/no	Is the innovation concerned with the given industry
Plastics value chain	Yes/no	
Steel value chain	Yes/no	

Meat and dairy value chain	Yes/no	
Is this innovation designed to substitute one of our four industries?	Yes/no	An example here would be meat or dairy substitutes for the food sector or innovative wood building substitutes for the steel sector
Primary part of the value chain captured by this innovation?	Drop-down list <ul style="list-style-type: none"> <li>- Finance</li> <li>- Production</li> <li>- Consumption</li> <li>- Recycling</li> </ul>	Which element of the value chain is most interesting/relevant for this innovation? Select the primary option
<b>2. Describing the innovation</b>		
Brief description of innovation	Text <sup>1</sup> – 100 words max.	Briefly summarize the innovation, either in own words or copied text from the innovation (in which case, be sure to cite)
Type of innovation	Drop-down list <ul style="list-style-type: none"> <li>- Social</li> <li>- Technological</li> </ul>	See definitions and explanations at the end of this document
Year launched	Text	Year the initiative is launched or the innovation is available on the market
Innovation diffusion	Text	If the information is available, then list the locations where the innovation has been implemented. Please be as specific as possible and when relevant.
Type of product/service	Bulk/Differentiated	Is the product/service associated with the innovation (at the relevant stage in the production chain) a bulk commodity or a differentiated product/service?
<b>3. Actors involved in the innovation</b>		
Name of focal actor behind the innovation	Text – 50 words max.	Name the organisation which appears to be the central actor for the innovation
Role of focal actor for the innovation	Text – 100 words max.	Describe the role of the focal actor in the innovation and why it is considered the focal actor
Focal actor's organizational type	Drop down menu: <ul style="list-style-type: none"> <li>- Firm</li> <li>- University</li> </ul>	Select the most appropriate category

<sup>1</sup> Text can either be in own words or pasted from the innovation's own material. If pasting in a copied description be sure to provide quotation marks and sources.

	<ul style="list-style-type: none"> <li>- Research institute</li> <li>- Government body</li> <li>- NGO/Philanthropy</li> <li>- Industry association</li> <li>- Other</li> </ul>	
Focal actor's size	Drop down menu: <ul style="list-style-type: none"> <li>- &lt; 50 employees</li> <li>- 50-250 employees</li> <li>- &gt; 250 employees</li> </ul>	Size refers to the organization as a whole, i.e. not unit or plant
Focal actor's location (city)	Text	Provide the city where the focal actor is based. If the organization has multiple addresses, then select the address of the unit which appears most central to the innovation. If this is not clear, then select the city of the HQ.
Is this innovation the product of a spinoff/does the actor behind the innovation have a clear connection with another firm/organization?	Yes/No	Does the primary organization behind the innovation have ties in some way to another organization?
If yes, please explain how the primary organization behind the innovation is connected to another organization or firm.	Text	Briefly describe the nature of the relationship
Has the organization been established to introduce the innovation?	Text	Is this innovation the only innovation or initiative developed by the company (ie are the company and innovation one and the same)?
Name of collaborator 1	Text	Name the first organisation which appears to be a central collaborator for the innovation
Role of collaborator 1 for the innovation	Text – 100 words max.	Describe the role of collaborator 1 in the innovation and why it is considered an important collaborator
Collaborator 1's organizational type	Drop down menu: <ul style="list-style-type: none"> <li>- Firm</li> <li>- University</li> <li>- Research institute</li> <li>- Government body</li> <li>- NGO</li> <li>- Industry association</li> <li>- Other</li> </ul>	Select the most appropriate category
Collaborator 1's size	Drop down menu: <ul style="list-style-type: none"> <li>- &lt; 50 employees</li> <li>- 50-250 employees</li> </ul>	Size refers to the organization as a whole, i.e. not unit or plant

	- > 250 employees	
Collaborator 1's location (city)	Text	Provide the city where the focal actor is based. If the organization has multiple addresses, then select the address of the unit which appears most central to the innovation. If this is not clear, then select the city of the HQ.
4. Decarbonisation		
Does decarbonisation take place through energy efficiency?	Yes/No	Does reduction of CO2 occur by using less energy in production (e.g., furnace insulation)?
Does decarbonisation take place through emissions efficiency?	Yes/No	Does reduction of CO2 occur by using less carbon-intensive energy or feedstock (e.g., switching to non-fossil fuel electricity supply) or by applying CCU/S technology?
Does decarbonisation take place through material efficiency in manufacturing?	Yes/No	Does reduction of CO2 occur by using less materials to produce a product (e.g., reducing yield losses in blanking and stamping sheet metal)?
Does decarbonisation take place through material efficiency in product design?	Yes/No	Does reduction of CO2 occur by designing products that require less materials (e.g., extended product life or light-weight design)?
Does decarbonisation take place through product-service efficiency?	Yes/No	Does reduction of CO2 occur by using the products in a more efficient way (e.g., car sharing)?
Does decarbonisation take place through service demand reduction	Yes/No	Does reduction of CO2 occur by using less of the product (e.g., switching from private to public transport)?
Realized CO <sub>2</sub> reduction capabilities of the innovation	Text – max 100 words	Provide a brief description of the realized CO <sub>2</sub> reduction capabilities of the innovation. It is unlikely each innovation will assess or calculate these figures in the same manner, so please provide the most general and broad range figure possible.
Realized CO <sub>2</sub> reduction capabilities of the innovation – source	Drop-down list - Self-reporting - Independently	Select the source of the realized CO <sub>2</sub> reduction capabilities reported above

	verified - Other	
CO <sub>2</sub> reduction in focus?	Yes/No	Is the innovation's reduction of CO <sub>2</sub> a co-benefit arising from other aim/activity?
CO <sub>2</sub> reduction in focus? – explanation	Text – 25 words max	Please explain
5. Funding the innovation		
Source of funding – primary firm/organization	Yes/no/do not know	Did the primary firm invest money or other resources in the development of the innovation?
Source of funding – collaborator 1	Yes/no/do not know	Did collaborator 1 invest money or other resources in the development of the innovation?
Source of funding – private investor	Yes/no/do not know	Did a private investor invest money or other resources in the development of the innovation?
Source of funding – government	Yes/no/do not know	Did the government invest money or other resources in the development of the innovation?
Source of funding – international organization	Yes/no/do not know	Did an international organization invest money or other resources in the development of the innovation?
Source of funding – NGO/Philanthropy	Yes/no/do not know	Did an NGO invest money or other resources in the development of the innovation?
Source of funding – other	Yes/no/do not know	Did another type of actor invest money or other resources in the development of the innovation?
6. Drivers of the innovation		
Government regulation, legislation and planning guidance	Yes/No	Has the innovation reportedly been driven by government regulation, legislation or planning guidance?
Government regulation, legislation and planning guidance – explanation	Text – 25 words max	If yes, please explain which type of regulation, legislation or planning guidance
(Voluntary) Standards and targets	Yes/No	Has the innovation reportedly been driven by aid compliance or progress toward a standard, scheme, or target?
(Voluntary) Standards and targets –	Text – 25 words max	If yes, please explain which

explanation		type of standard, scheme, or target
Corporate social responsibility	Yes/No	Has the innovation reportedly been driven by corporate social responsibility?
Corporate social responsibility – explanation	Text – 25 words max	If yes, please explain
Market demand	Yes/No	Has the innovation reportedly been driven by market demand?
Market demand – explanation	Text – 25 words max	If yes, please explain which type of downstream demand
Technology supply	Yes/No	Has the innovation reportedly been driven by the availability of new technology?
Technology supply – explanation	Text – 25 words max	If yes, please explain which new technologies
Material properties	Yes/No	Has the innovation reportedly been driven by material properties?
Material properties – explanation	Text – 25 words max	If yes, please explain in which way
Stakeholder pressure	Yes/No	Has the innovation reportedly been driven by pressure from stakeholders, including public campaign and pressure from NGOs?
Stakeholder pressure – explanation	Text – 25 words max	If yes, please explain which type of stakeholder pressure
Other	Yes/No	Has the innovation reportedly been driven by other drivers, not mentioned above?
Other – explanation	Text – 25 words max	If yes, please explain
<b>7. (Co-)benefits and disadvantages</b>		
Benefits from the innovation	Drop down list <ul style="list-style-type: none"> <li>- Focal actor</li> <li>- Other actor</li> <li>- Both</li> </ul>	Do the benefits of the innovation accrue to the focal actor, or does the innovation rely on demonstrating quality/cost differentiation to elsewhere in the product chain?
Visibility of innovation	Drop down list <ul style="list-style-type: none"> <li>- Public-facing product</li> <li>- Component or ingredient</li> </ul>	Is the innovation perceptible or potentially perceptible to the consumer or public? (versus products sold as components or ingredients)
Social co-benefits of the innovation	Text	50 words max
Economic co-benefits of the innovation	Text	50 words max
Environmental co-benefits of the innovation (aside from CO <sub>2</sub>	Text	50 words max

reduction)		
Adverse social impacts of the innovation	Text	50 words max
Adverse economic impacts of the innovation	Text	50 words max
Adverse environmental impacts of the innovation	Text	50 words max
Sources		
Sources	Text (links and/or references)	List all sources used

## Definitions of innovation types

<b>Social</b>	<b>Policy</b>	A policy innovation refers to new (or significant changes in) in public policy frameworks such as new forms of regulations and public incentives. Interventions include legal designations, regulation, strategic prioritisation; development of policy instruments, e.g. voluntary agreements, certifications, benchmarks.
	Governance	A governance innovation refers to new (or significant changes in) public or private governance frameworks and/or arrangements. Interventions include new forms of collaboration between public and private actors, citizen engagement efforts, value chain management, firm-specific campaigns.
	Economic	An economic innovation refers to new (or significant changes in) economic frameworks or modes of operation. Interventions include new business models, financing arrangements, ways in which value is assessed and marketed.
<b>Technological</b>	Product	A product innovation is the introduction of a good or service that is new or has significantly improved characteristics or intended uses. Interventions could include new specific plant-based packaging, new meat substitutes
	Process	A process innovation refers to the implementation of a new or significantly improved production or delivery method. Interventions could include energy reduction or energy efficiency improvements in steelmaking, recycling advancements. .



