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Report on business models

LOCALISED Deliverable 7.3

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LOCALISED

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List of Abbreviations

BMC	Business Model Canvas
LSBMC	LOCALISED Sustainable Business Model Canvas
SME	Small and Medium Enterprises
SBC	Sustainable Business Canvas
SBM	Sustainable Business Models
SDGs	Sustainable Development Goals
SOIs	Sustainable Oriented Indicators

Executive Summary

The overriding objective of LOCALISED project is to downscale national decarbonisation trajectories consistent with Europe's net-zero target to the local levels in a way that would speed up the uptake of mitigation and adaptation actions. Consequently, and specifically through the implementation of (1) the Climate Action Strategiser and (2) the Net-Zero Business Consultant tool, the project will allow local authorities and policy-makers, as well as citizens and businesses, to identify viable combinations and best practices of (sectoral) mitigation and adaptation measures.

Specifically, to empower businesses and successfully engage them in the transition towards net-zero, LOCALISED will provide information on emerging mitigation and adaptation technologies in key sectors of the economy and possible ways to overcome negative impacts, including instruments, financial incentives, and other relevant aspects. For this focal group of stakeholders, the project will build the LOCALISED Net-Zero Business Consultant, translating model results and viable pathways into user guidance and a set of practical recommendations for sound business practices.

The Sustainable Business Models Canvas (LSBMC) developed by LOCALISED has been designed to assist organisations in identifying the nine essential elements of business models (supplies & outsourcing, production, functional value, materials, end of life, distribution, use phase, environmental impact, environmental benefits) explicitly to recognise the benefits and solutions for end-users and all involved parties. In addition, it provides business best practices in the main economic sectors, namely manufacturing, agriculture, construction, and transportation. The case studies will allow the visualisation of relevant measures, financial incentives, and programs that facilitate investments in decarbonisation technologies. Moreover, by merging the canvas with other key project outcomes, such as the comprehensive database of measures, instruments, and indicators, we can gain a valuable understanding of the intricate dynamics of the private sector and pinpoint specific aspects relevant to businesses and their operations.

Within this framework, an Excel tool (https://doi.org/10.5281/zenodo.13809695) has been developed to assist companies in analysing their current business models. The tool aims to help businesses visualise potential improvements, explore compatible pathways for decarbonisation, and identify barriers. This report serves as a user guide, describing the context, the tool's capabilities, and the project outcomes integrated into it. Nevertheless, a test will be conducted with a limited number of companies during the following months to check its validity. Based on their feedback and the lessons learned from this process, a second version of the tool will be presented by the end of 2024.

1. Introduction

In today's world, economic crises, global epidemics, and environmental or climate change issues constantly compel us to review and discuss solutions to promote sustainable development, improve living conditions and, therefore, balance environmental, social, and economic aspects. (Strange & Bayley, 2008). In recent years, business models have received much attention since they play a key role in the process (Dohrmann, Raith, & Siebold, 2015; Kleine & von Hauff, 2009; Lüdeke-Freund, Carroux, Joyce, Massa, & Breuer, 2018; Rauter, Jonker, & Baumgartner, 2017; Upward & Jones, 2015). In light of their respective functions and the increasingly stringent regulatory landscape, with new laws targeting emissions reduction, energy efficiency, and sustainable practices, to stay competitive, businesses will need to integrate environmental requirements into their strategies, transitioning to low-carbon technologies, reducing waste, and reconfiguring supply chains. In a world increasingly focused on sustainability, not adapting to new environmental standards and regulations could entail reputational damage or a loss of market share. However, even though companies are increasingly employing sustainability practices and considering social aspects, many organisations still have profit-oriented business models that hinder sustainability progress in the business sector.

Despite the significant progress in fostering the implementation of new business models that prioritise innovation, sustainability, and social responsibility, many organisations still have not rethought their traditional business models. A wealth of literature, including books and scientific publications, can be found analysing these business models, their solutions, and the potential challenges and opportunities (Bocken, Short, Rana, & Evans, 2014; Breuer, Fichter, Lüdeke-Freund, & Tiemann, 2018; Lüdeke-Freund, Carroux, et al., 2018). Within this collection, it is possible to find papers and articles introducing a literature review of existing patterns, taxonomy, and methodologies for analysing and improving business models (Joyce & Paquin, 2016; Lüdeke-Freund, Gold, & Bocken, 2018; Remane, Hanelt, Tesch, & Kolbe, 2017; Wunder, 2019). Several aspects are studied, such as the integration of circular economy, innovation, sustainability transparency, and fair policies.

Considering these challenges, the main objective of the LOCALISED project is to provide end-user solutions for regional businesses and investors that align with decarbonisation pathways. LOCALISED Work Package 7 is devoted to analysing end-user decarbonisation solutions for regional companies and investors. The work done under this work package will help characterise how local businesses can implement emerging mitigation and adaptation options and develop low-carbon business models. This will

involve analysing the potential impact of various technologies in reducing carbon emissions and identifying the obstacles to implementing these technologies.

In addition to the project's primary business tool, this task offers a methodology for implementing and analysing business models. Hence, as a result of this task, a complementary tool, the LOCALISED Sustainable Business Model Canvas (LSBMC), was developed. The tool will be particularly useful for companies that lack the resources, information, or expertise to conduct complex strategic reviews on their own, such as small and medium-sized enterprises (SMEs) which are struggling to keep up with rapidly changing regulations and sustainability demands due to limited budgets and internal knowledge.

The tool's objective is to facilitate an initial analysis of their current business model, identify areas for improvement, and recommend potential measures and instruments to overcome the primary challenges. It will also connect these suggestions with relevant Sustainable Oriented Indicators (SOIs) and the Sustainable Development Goals (SDGs). Hence consolidating key insights and recommendations that would otherwise require additional resources and budget, enabling these businesses to make informed decisions, optimize their resources, and remain competitive in a market that increasingly prioritizes sustainability. In the current context, the aforementioned tool constitutes a key resource that simplifies the process by providing a step-by-step framework for analysing their current operations, identifying gaps, and uncovering opportunities for sustainable improvements. This report summarises the main features and describes the necessary steps to use the tool.

This report, therefore, serves as a user guideline. The document is structured in the following sections. Section 2 describes the background on the subject, section 3 describes the methodology and the different capabilities of the tool, and section 4 summarises the conclusions.

2. Contextualisation

2.1. Sustainable Business Models

Climate change is a significant and intricate issue, requiring extensive collaboration among individuals, businesses, governments, and other relevant stakeholders. Companies have a crucial role in addressing social and environmental challenges, as these issues can also present significant business opportunities. But to respond to the challenges of the future, the three main aspects embedded in the architectural framework of a company must be driven by equally balanced goals considering social, environmental, and economic aspects. That is, how to create value and for whom, how

to deliver that value consistently over time, and how to capture value from those transactions, so is possible to make a profit. To do so, innovative ways of getting the job done need to be implemented and replicated. Innovation is a new means-end combination.

In other words, to adapt to future needs, companies must be willing to explore innovative ways of creating, capturing, and delivering value. This entails shifting from the traditional sole focus on profitability towards a more integrated model. In that sense, a ***Sustainable Business Model (SBM)*** can be defined as a model that "*helps describing, analysing, managing, and communicating (i) a company's sustainable value proposition to its customers, and all other stakeholders, (ii) how it creates and delivers this value, (iii) and how it captures economic value while maintaining or regenerating natural, social, and economic capital beyond its organizational boundaries*." (Schaltegger, Hansen, & Lüdeke-Freund, 2016). As stated by the authors, at least five features can be identified around the notion of SBM:

- An explicit sustainability orientation, integrating ecological, social and economic concerns.
- An extended notion of value creation, questioning traditional definitions of value and success.
- An extended notion of value capture in terms of those for whom value is created.
- An explicit emphasis on the need to consider stakeholders and not just customers.
- An extended perspective on the wider system in which an SBM is embedded.

There are multiple examples of this innovative transformation, both related to environmental aspects, social, or economic ones.

One example of this transformation is the circular business model. A circular economy may be defined as *"a regenerative system in which resource input and waste, emission, and energy leakage are minimised by slowing, closing, and narrowing material and energy loops. This can be achieved through long-lasting design, maintenance, repair, reuse, remanufacturing, refurbishing, and recycling"* (Geissdoerfer, Savaget, Bocken, & Hultink, 2017). This innovative approach can offer many advantages, from optimising efficiency and life cycles to rationalising resources.

Another example is the access economy, which is turning the industry from an ownership-based model to an access-based model. An access economy implies a shift in the logic of the business from a product to a subscription-based service. This kind of model increases resource efficiency by leaving the ownership in the hands of the manufacturer of the product. In a subscription-based business model, the company

provides all the required resources and conducts various activities to ensure that their products continue to function effectively over time. This may include regular maintenance, updates, and customer support to keep the products in optimal condition. In return for these ongoing services, the company charges a monthly fee to capture the value they provide to their customers.

However, environmental aspects are not the only values that should drive the company. In order to have a systemic approximation to sustainability, many other aspects could be assessed by an organisation, such as:

- ✓ Governance, transparency, and equity:
  - Promote transparency, diversity, equity, and inclusion in the company.
  - Create awareness campaigns and ethical behaviour guidelines.
- ✓ Partnerships:
  - Establish key partnerships with relevant actors, such as NGOs and other public authorities, that acknowledge that sustainable development cannot be achieved alone.
- ✓ Education and outreach:
  - Implement learning and development programs to ensure that training and courses are accessible to all.
  - Collaborate with non-profit associations and donate time or resources.
  - Disseminate good practices and knowledge to other spheres.

One particular classification approach was first proposed by Lüdeke-Freund et al., which consists of a methodology to analyse and develop sustainability-oriented business models (Lüdeke-Freund, Carroux, et al., 2018). Using patterns as a problem-solution combination and following a multi-method and multi-step approach, they identified and validated 45 SBM patterns that can be used in business model tools.

There are several types of value creation and business spectrums. As seen in ***Figure 1***, it is possible to analyse companies based on how much the economic, environmental, or ecological factors influence their model. Some companies can be more socially oriented, and others more environmentally friendly. By analysing this triangle and the current structure of the company, organisations can have a preliminary assessment of their situation and visualise how far they are from the centre that represents the most equilibrated model.

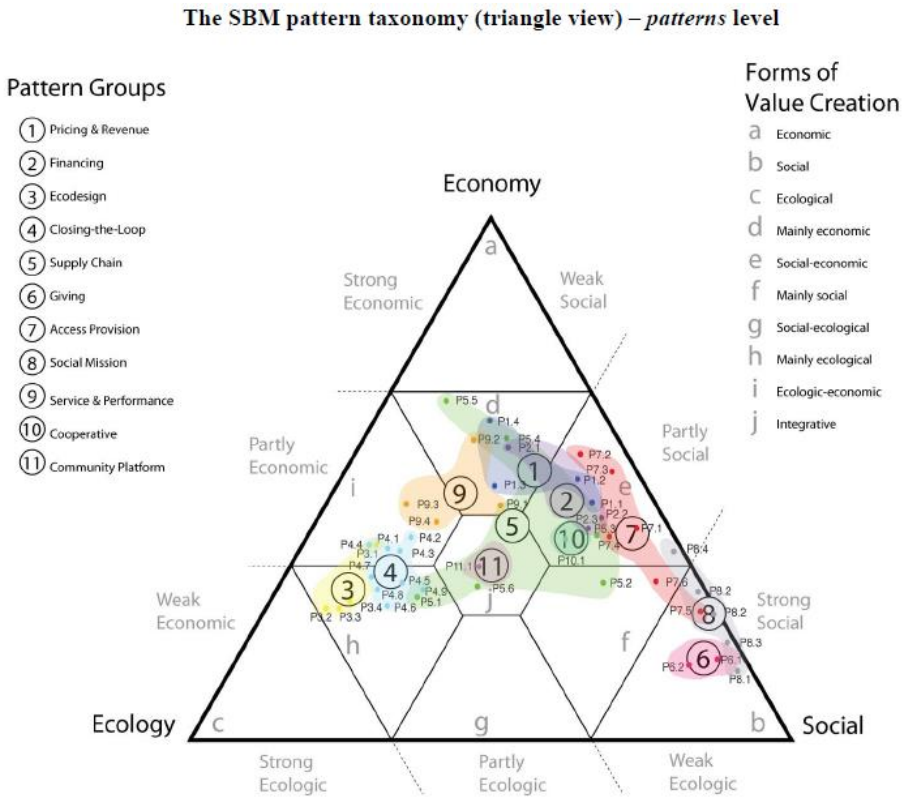


Figure 1 The SBM pattern taxonomy (triangle view) – patterns level. Source: Lüdeke-Freund, Carroux, et al., 2018

The different colours represent the pattern groups of the companies analysed for the study. As an example, Eco-design companies are comprised in the yellow shape.

2.2. Innovative Business Models and Sustainable Development Goals

The Sustainable Development Goals (SDGs) established by the United Nations, approved in 2015 and signed by 193 nations, established an ambitious roadmap to achieve sustainable development. Nevertheless, the achievement of these goals demands a collective effort and collaborations between the different governmental levels, citizens, and the private sector. The private sector plays a crucial role in the transition to a greener economy. According to the World Economic Forum, the private sector is responsible for over 80% of greenhouse gas emissions in the European Union (EU) (World Economic Forum, 2024). This means that their transformation is essential for reaching sustainable goals. Collaborating with organisations is crucial to lower the emissions but also due to their capacity to offer investment capital, support research and innovation, generate employment opportunities, and facilitate skills development across diverse nations.

In the current context, the SDG framework holds the potential to significantly reshape markets by fostering inclusivity, fairness, and sustainability. By prioritising these aspects, the framework can not only facilitate financial gains but also contribute to overcoming the challenges of the future. However, incorporating sustainability into business models is a complex process, and as highlighted by the Global Reporting Initiative (GRI) report "*State Of Progress: Business Contributions To The SDGs*". Even though businesses are starting to integrate the SDGs into their corporate reporting, most of them have not set explicitly aligned targets with the SDGs and the overwhelming majority of businesses are also not yet reporting data on progress towards the SDGs (Global Reporting Initiative, 2021). Furthermore, a study that analysed the Fortune Global Top 500 corporations revealed uneven engagement across sectors and countries and the superficiality of the assessment, almost 33% of the corporations analysed matched their usual business practices with SDGs, whereas only 22.8% of the corporations developed specific actions or strategies (Song et al., 2022). In addition, small and medium businesses seem to be facing greater challenges in integrating sustainable goals. A study that examined a sample of 8,500 organisations determined that only about 16% of SMEs report on SDGs, while larger companies report at a rate of 45% (Thammaraksa, Gebara, Hauschild, Pontoppidan, & Laurent, 2024).

Some of the conclusions of these studies highlight the need for:

- ✓ Methodologies that guarantee a systemic approach and the proper integration of SDGs in the core of businesses.
- ✓ Developing systematic and comprehensive evaluation tools to assess the impact and progress of the business sector.
- ✓ More guidance on SDG indicator selection and performance assessment to establish a set of uniform indicators and allow benchmarking between organisations.
- ✓ Policy support from public administration to foster inclusive and green economies and give preference to businesses that are willing to integrate SDGs into their core corporation structure.
- ✓ Business transparency to verify the level of engagement with the SDGs framework.
- ✓ Innovative business models and financial instruments to accelerate the transition

3. LOCALISED Sustainable Business Canvas Tool to promote SBM and SDGs.

3.1. Methodology

In order to conduct an in-depth analysis of the environmental aspects of the company's current business model and identify specific areas for improvement, as well as measures and actions to be implemented, a comprehensive three-step methodology was proposed. As seen in ***Figure 2*** the first step involved reviewing existing methodologies and literature to gather insights and best practices. This was followed by two subsequent processes aimed at selecting the most appropriate structure and the project outcomes to integrate. Additionally, a fourth step is planned for the upcoming months, which will involve the validation and testing of the proposed tool with real-world companies to ensure its practical applicability and effectiveness.

The objective of the tool will be to help businesses identify solutions and instruments and the benefits and impacts associated with their implementation. Furthermore, the final structure proposed and the integrated features could help overcome the main challenges pointed out in the literature, therefore accelerating the transition to more sustainable models. The focus of the tool will be namely on four sectors: manufacturing, agriculture, construction, and transportation, in particular small and medium organisations. Special attention will be paid to industries in less represented areas in Europe, those with long lifetimes and with high energy intensity processes. The subsequent sections will provide a more detailed introduction to all the steps that have been followed.

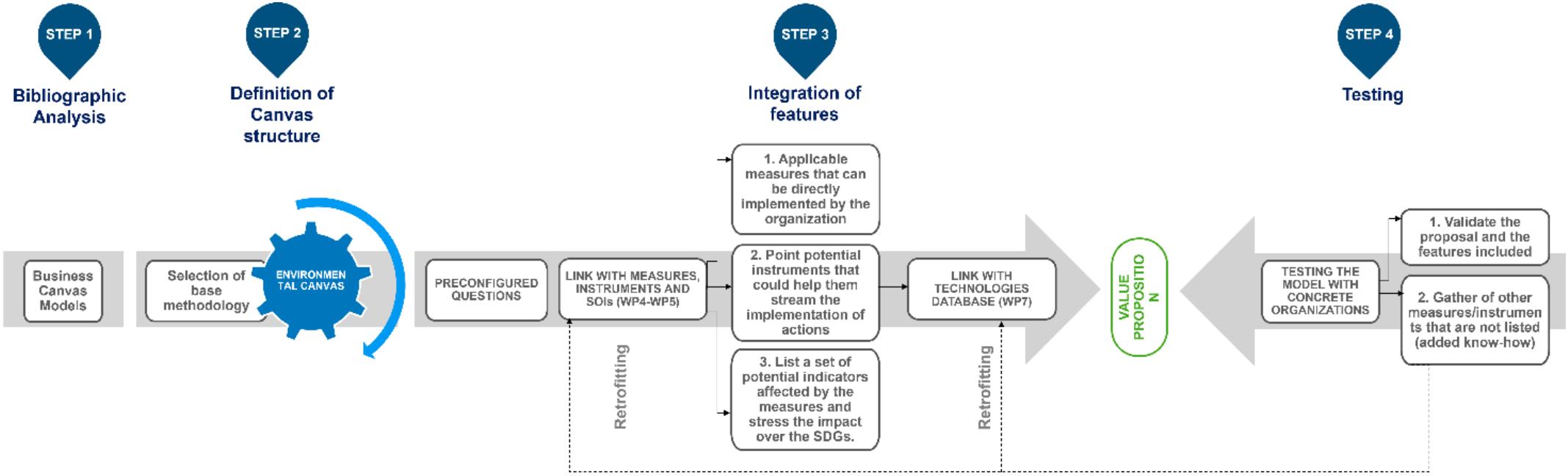


Figure 2 Sustainable Business Canvas. Source: own elaboration

3.2. Bibliographic review

The task's aim was to identify existing methodologies to assess sustainable business models. An initial search was conducted to identify scientific papers and grey literature, such as local reports. Scientific literature was identified with the Web of Science engine, using Sustainable Business Models with canvas as an additional keyword and filtering the results to obtain documents published in the business economic sector. Several other sources were identified using the Google engine, facilitating the identification of complementary methodologies and guidelines. In addition, other initiatives were found through references in scientific articles or institutional reports and the authors' professional networks. As a result, a total of 196 resources were listed, 151 coming from the engine Web of Science + 45 additional publications gathered with Google engine and through references.

Various methodologies, tools, and guidelines were found with the aim of exploring new business opportunities and analysing crucial corporate aspects. Among the existing methodologies, the most common formal representation of a business model is the Business Model Canvas (BMC) (Clark, Osterwalder, & Yves, 2012), which has been widely adopted (Beltramello, Haie-Fayle, & Pilat, 2013; Kaplan, 2012; Massa & Tucci, 2013; Nordic Innovation, 2012; Sort & Nielsen, 2018).

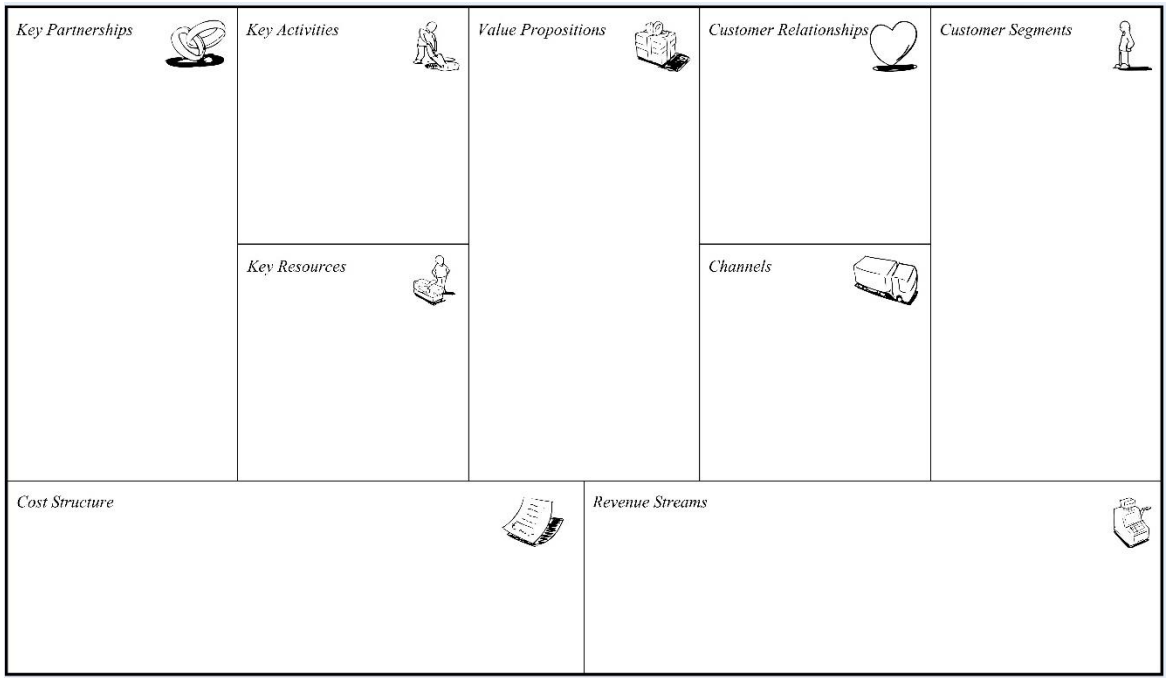


Figure 3 *Business Model Canvas. Source: Business Model You. A One-Page Method for Reinventing Your Career.*

The BMC can help users visually represent the different elements of a business model, enable discussions, and explore potential innovations. In specific, the BMC describes the logic of how a company generates profit. Comprising nine interrelated blocks, namely key partners, key activities, key resources, value proposition, customer relationships, customer segments, channels, cost, and revenue, the BMC provides a comprehensive framework for visualising and comprehending the crucial facets associated with the company's value proposition.

Nevertheless, BMC is just one of the many alternatives found in the literature, and numerous other proposals and variations of this initial model can be found. Some authors proposed a triangle representation based on four dimensions: who, what, and how, with the customer at the centre (Gassmann, Frankenberger, & Csik, 2014). Others propose improvements over the original model, such as adding explicit sections to deal with environmental benefits and impacts, generating subsections within each aspect to cover all original dimensions or highlighting the link with the SDGs (Cardeal, Höse, Ines, & Götze, 2020; Fichter & Tiemann, 2015; Pardalis, Mahapatra, & Mainali, 2022; Sustainable Business Canvas, 2020; Van Tulder, 2023). Among those, two approaches can be mentioned due to their systemic approach to the inclusion of the environmental dimension. The Flourishing Business Canvas, as seen in ***Figure 4***, a three-nested model around environment, society, and economy with seventeen key aspects (previously called Strongly Sustainable Business Model (SSBM) (Upward & Jones, 2015) and the Triple layered Business Model Canvas, as shown in ***Figure 5***, that expanded the BMC with two additional layers: an environmental layer based on a lifecycle perspective and a social layer based on a stakeholder perspective (Joyce & Paquin, 2016).

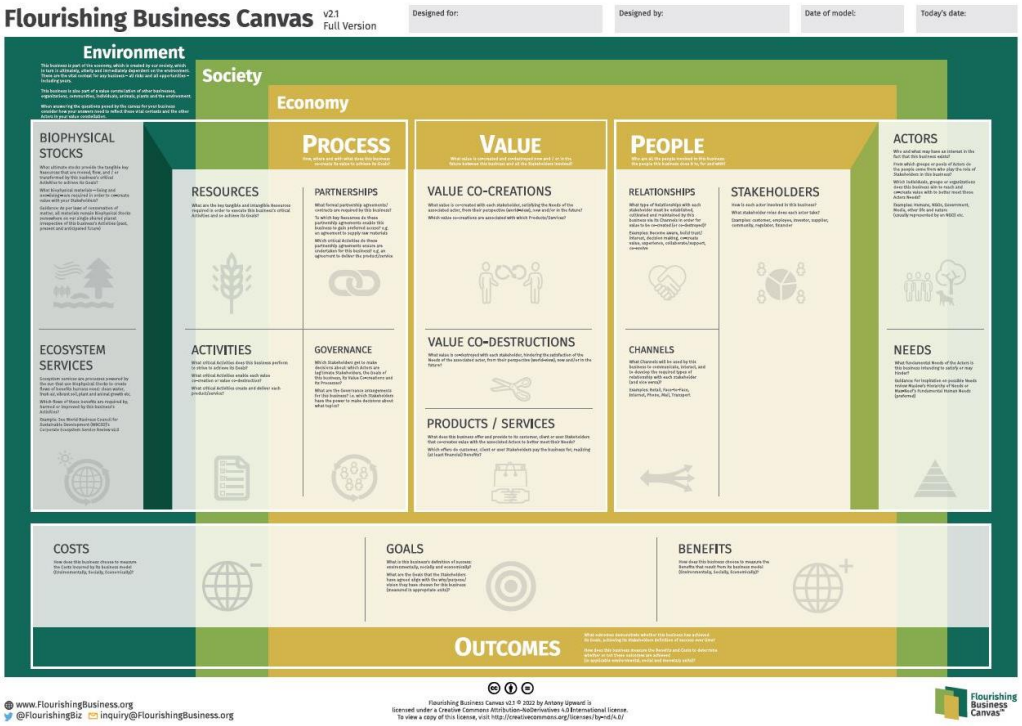


Figure 4 *Flourishing Business Canvas. Source: https://flourishingbusiness.org/*

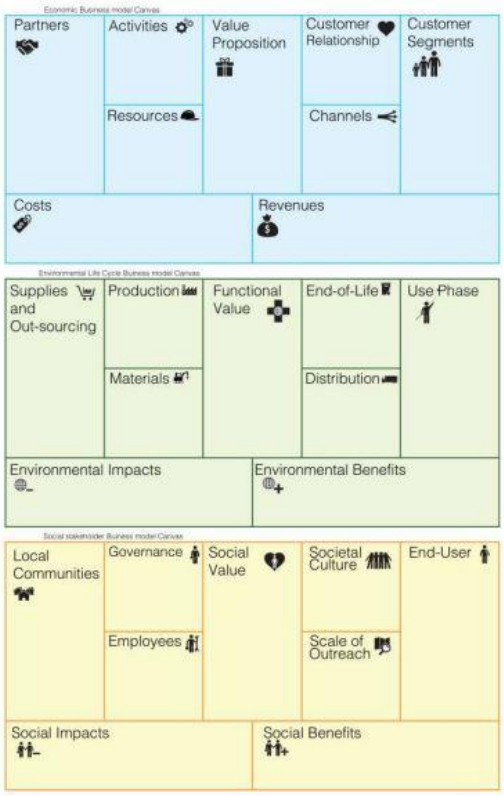


Figure 5 *Triple layer Business Model Canvas. Source: Pigneur & Joyce, 2015*

Nevertheless, even though a clear evolution of the original canvas can be seen and new interesting proposals have been presented with innovative aspects to analyse an organisation, so far, most of the available tools do not provide additional guidelines to understand which possible measures can be implemented or what indicators could be useful to monitor the changes. Given the potential for companies that are just starting this process, one of the primary objectives of the task was to develop a proposal that could integrate with the database of adaptation and mitigation measures and indicators developed in other tasks within the project.

3.3. Tool structure and integration of features

After examining various methodologies, the environmental layer within the triple-layer canvas was selected as the foundation for the tool's development due to its strong alignment with the task's objectives and the level of detail explored in the segment.

As stated before, other project outcomes were integrated into the tool, mainly:

- The database of measures, instruments and indicators developed in the framework of WP4 (Martínez Görbig et al., 2024).
- The link between measures, SOIs and SDGs analysed in WP5. (Ibañez Iralde, Pascual, & Lecocq, 2023)
- And a link with good practices and innovative technologies coming from WP7 (Shayegh, 2024).

A specialised Excel application was developed with the aim of seamlessly integrating all potential outcomes and providing a platform for dynamic interaction with users. This application comprises nine distinct sheets, based on the nine blocks of the environmental layer of the Triple layer Business Model Canvas, systematically covering the different segments, along with an initial summary page that encapsulates all the introduced information. The overarching objective is to offer a comprehensive representation of the current state and potential decarbonisation pathways. Additionally, apart from encompassing the various canvas areas, we have incorporated two supplementary features. Firstly, we have included the initial business model classification introduced by Lüdeke-Freund, Carroux, et al. (2018), thereby enabling businesses to easily visualise their current business model prior to populating the canvas. Secondly, an extra section has been dedicated to providing fact sheets with innovative business examples for each sector. Each of the sections is explained in the following subsection.

3.3.1. Tool description

LSBMC is developed within the LOCALISED project to provide end-user solutions for regional businesses and investors in line with decarbonisation pathways.

Considering the relevance of businesses for achieving decarbonisation goals, the goal of this tool is to help small and medium organisations in the manufacturing, agriculture, construction, and transportation sectors analyse the impact of climate change on their companies. This resource offers a methodology for implementing and analysing business models, identifying areas for improvement, and visualising potential measures and instruments to overcome decarbonisation barriers. In addition, based on a database of more than 400 measures and instruments and more than 250 indicators gathered during the project the tool also provides suggestions of potential indicators to monitor the measures and goals and the links with the Sustainable Development Goals (SDGs).

The version described in this document constitutes a first draft of the tool. In the following months, real companies will be contacted to test the tool to verify its usefulness and the comprehension of the included features. In addition, since the project task related to measures and indicators is still ongoing, the linkages presented in this first version might vary.

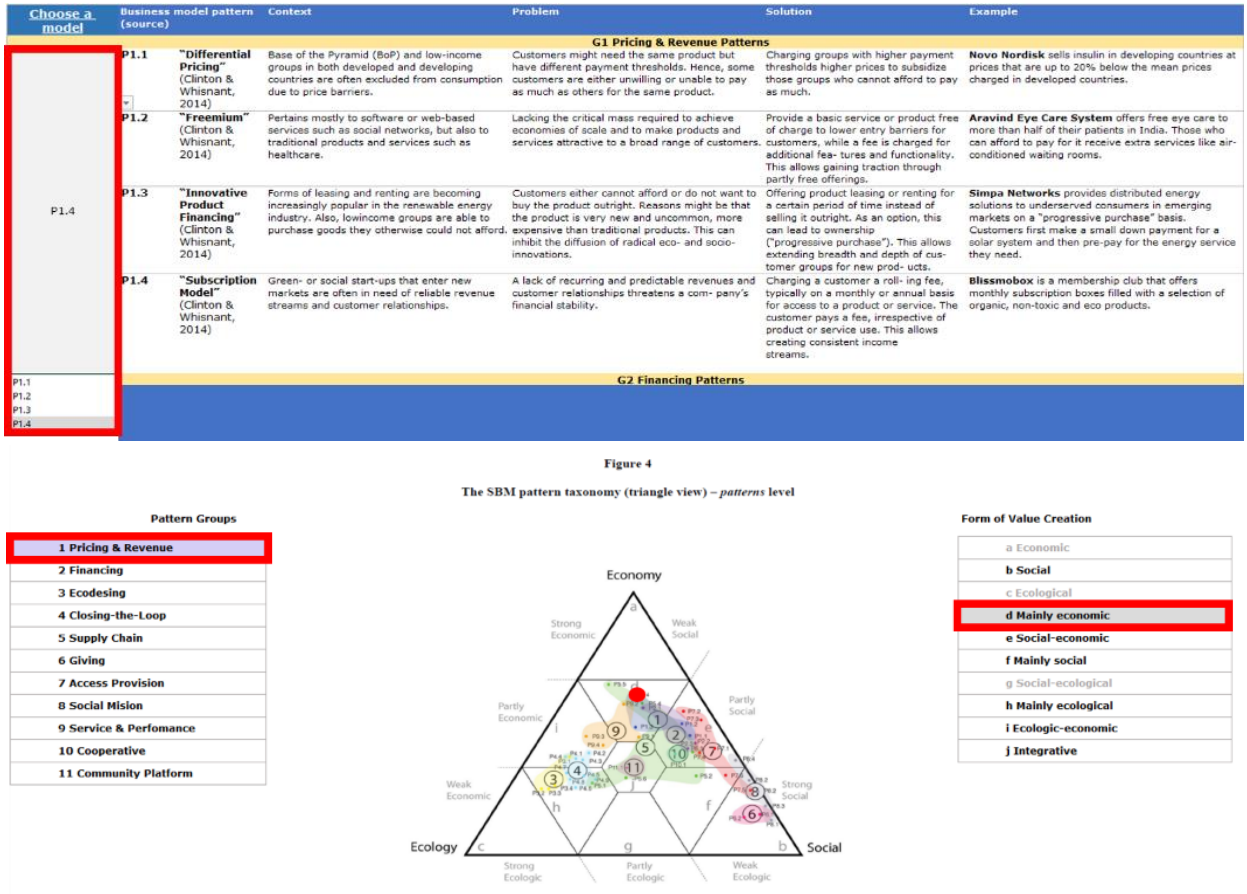
In regards of the target audience, even the tool can be utilised by an organisation by following the steps below. Nevertheless, the product's multifaceted capabilities will be best harnessed by individuals with a previous background of the subject matter. This includes professionals in specialized consultancy offices or specific departments within a company, who possess the expertise to adeptly navigate the intricate web of interactions between the diverse components. Their familiarity with the subject matter equips them to fully leverage the product's functionalities and ensure seamless integration within their professional practices.

The tool is publicly available and can be found in ZENODO:
https://doi.org/10.5281/zenodo.13809695

3.3.1.1. Guideline

The tool introduces two complementary aspects to analyse the business model: first, an initial approximation to understand the current business; and second, a detailed analysis of the environmental layer of the triple-layer business model canvas developed by Pigneur et al. (2015). Even though each of the parts mentioned can be studied independently, we recommend following the subsequent steps:

STEP 1. The first step is the "Preliminary Taxonomy" sheet. In there the end-user will find a triangle representation of existing business models which are driven by environmental, social, or economic goals. The aim of this initial assessment is to establish what is the current situation of the analysed business using the examples provided. In order to see in which area of the triangle the analysed business is currently placed, the user could go through the different business cases and select the one that resembles the company the most in the right part of the table. Once the user has selected it on the table, both the pattern and the value creation will be highlighted on the sides of the graphic. Using the number and the letter highlighted, the user will be able to locate the position on the triangle.



Choose a model	Business model pattern (source)		Context	Problem	Solution	Example
			G1 Pricing & Revenue Patterns			
P1.4	P1.1	**"Differential Pricing"** (Clinton & Whisnant, 2014)	Base of the Pyramid (BoP) and low-income groups in both developed and developing countries are often excluded from consumption due to price barriers.	Customers might need the same product but have different payment thresholds. Hence, some customers are either unwilling or unable to pay as much as others for the same product.	Charging groups with higher payment thresholds higher prices to subsidize those groups who cannot afford to pay as much.	**Novo Nordisk** sells insulin in developing countries at prices that are up to 20% below the mean prices charged in developed countries.
	P1.2	**"Freemium"** (Clinton & Whisnant, 2014)	Pertains mostly to software or web-based services such as social networks, but also to traditional products and services such as healthcare.	Lacking the critical mass required to achieve economies of scale and to make products and services attractive to a broad range of customers.	Provide a basic service or product free of charge to lower entry barriers for customers, while a fee is charged for additional fea- tures and functionality. This allows gaining traction through partly free offerings.	**Aravind Eye Care System** offers free eye care to more than half of their patients in India. Those who can afford to pay for it receive extra services like air-conditioned waiting rooms.
	P1.3	**"Innovative Product Financing"** (Clinton & Whisnant, 2014)	Forms of leasing and renting are becoming increasingly popular in the renewable energy industry. Also, lowincome groups are able to purchase goods they otherwise could not afford.	Customers either cannot afford or do not want to buy the product outright. Reasons might be that the product is very new and uncommon, more expensive than traditional products. This can inhibit the diffusion of radical eco- and socio-innovations.	Offering product leasing or renting for a certain period of time instead of selling it outright. As an option, this can lead to ownership ("progressive purchase"). This allows extending breadth and depth of cus- tomer groups for new prod- ucts.	**Simpa Networks** provides distributed energy solutions to underserved consumers in emerging markets on a "progressive purchase" basis. Customers first make a small down payment for a solar system and then pre-pay for the energy service they need.
	P1.4	**"Subscription Model"** (Clinton & Whisnant, 2014)	Green- or social start-ups that enter new markets are often in need of reliable revenue streams and customer relationships.	A lack of recurring and predictable revenues and customer relationships threatens a com- pany's financial stability.	Charging a customer a roll- ing fee, typically on a monthly or annual basis for access to a product or service. The customer pays a fee, irrespective of product or service use. This allows creating consistent income streams.	**Blissmobox** is a membership club that offers monthly subscription boxes filled with a selection of organic, non-toxic and eco products.
P1.1 P1.2 P1.3 P1.4			**G2 Financing Patterns**			

Figure 4

The SBM pattern taxonomy (triangle view) – *patterns* level

Pattern Groups

1 Pricing & Revenue
2 Financing
3 Ecodesing
4 Closing-the-Loop
5 Supply Chain
6 Giving
7 Access Provision
8 Social Mision
9 Service & Perfomance
10 Cooperative
11 Community Platform

Form of Value Creation

a Economic
b Social
c Ecological
d Mainly economic
e Social-economic
f Mainly social
g Social-ecological
h Mainly ecological
i Ecologic-economic
j Integrative

Figure 6 *Preliminary business categorisation. Source: own elaboration*

STEP 2. After the users have an initial overview of their current model, they can explore in more detail which aspects influence their company's environmental behaviour. The nine parts of the canvas are represented in separate sheets. In order to start using this second part of the tool, it is necessary to fill out the grey fields in the instruction section. It is fundamental to verify that these files are

filled out and have correct information since they are linked to the different features of the tool.

NAME OF THE COMPANY	Name
SECTOR	Agriculture
COUNTRY	Croatia

Figure 7 *Basic information needed to run the tool. Source: own elaboration*

In order to have a complete overview, the user needs to go through the nine blue-coloured sheets:

a. Functional Value
b. Supplies & Outsourcing
c. Production
d. Materials
e. Distribution
f. Use Phase
g. End of Life
h. Environmental Impact
i. Environmental Benefits

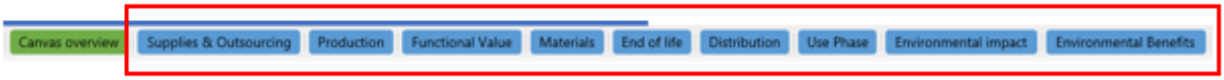


Figure 8 *Working sheets of the canvas. Source: own elaboration*

The first seven sections of the canvas are divided into two segments: firstly, an introductory section with key questions to start reflecting on the business model and secondly, a section to select or indicate measures that are being considered to improve the current situation. To obtain the final picture of their current situation, the users have to answer the key questions of the first section, select or describe the measures in the first grey column of the second section, and fill in the blank spaces.

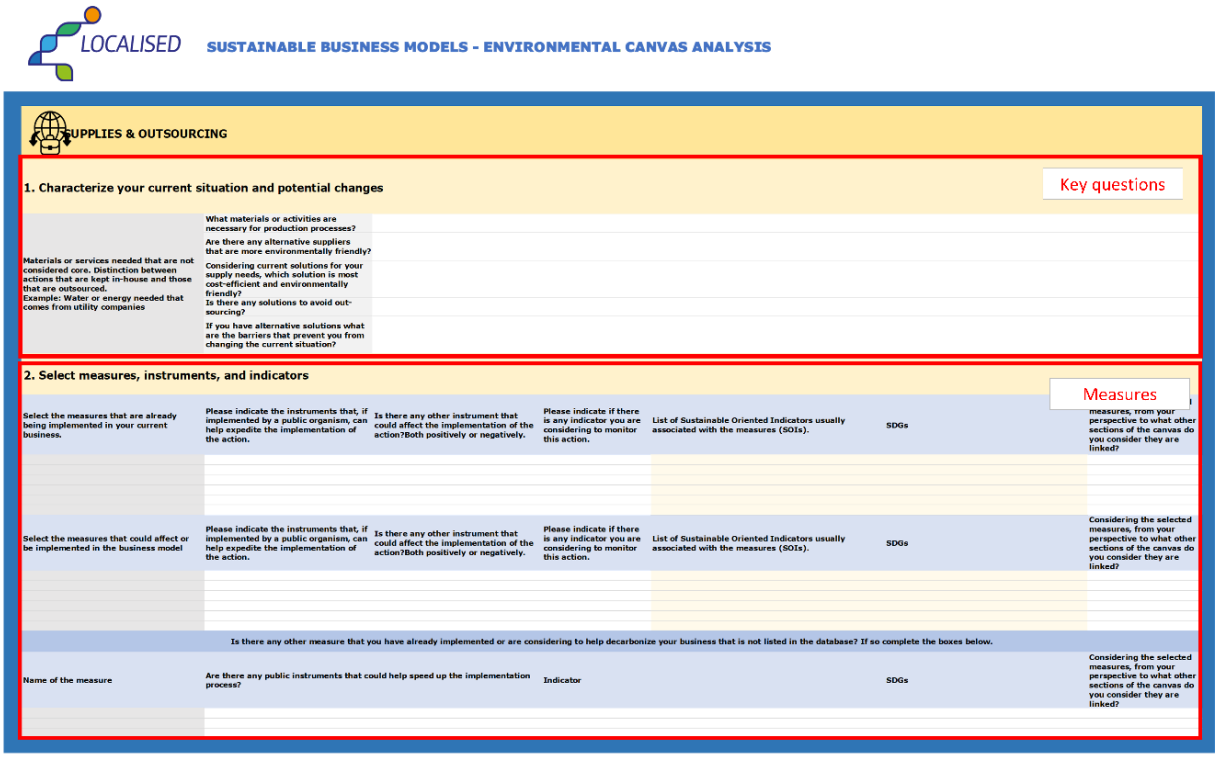


Figure 9 *Example of the structure of the main parts of the canvas. Source: own elaboration*

In order to have a complete picture of the actions that are being considered, the second part, which is dedicated to the measures, is subdivided into three segments:

- Segment 1: measures that the company has already implemented or is already exploring,
- Segment 2: measures that the company is considering for the future
- Segment 3: a blank section to introduce measures that are not listed in the current database.

The first two subsections contain dropdown lists with a list of potential measures and instruments, including a set of suggested indicators and their link with the Sustainable Development Goals (SDGs).

As shown in ***Figure 10***, the first column of the measure section contains the measures filtered according to the sector introduced in the introduction sheet. After selecting the measure, and with the objective of visualising the influence of external factors such as public laws and financial help, the user will have the opportunity to select one or multiple instruments that can influence the implementation of the measure. SDGs and associated indicators will be filled in automatically when a measure in the database is selected.

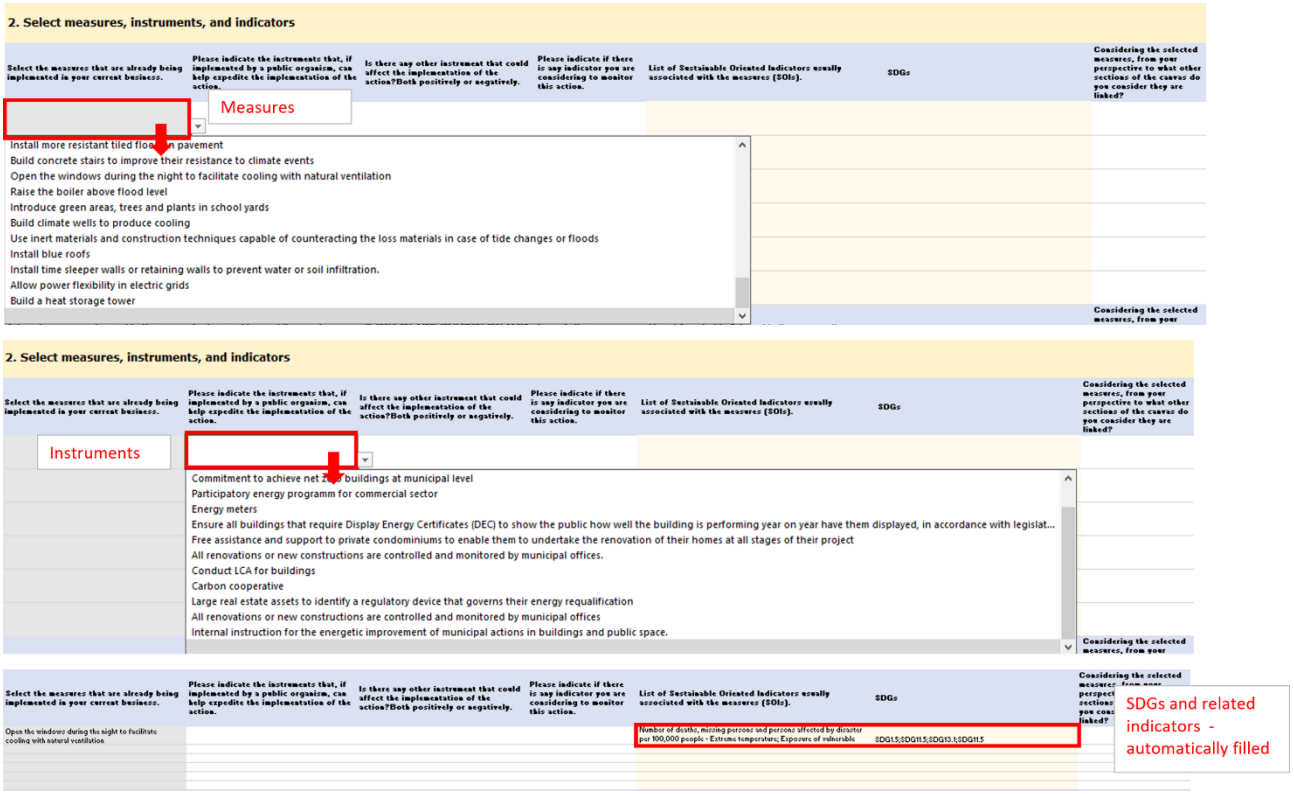


Figure 10 *Structure of the measure section. Source: own elaboration*

In addition, blank spaces were included to introduce complementary information, such as other limitations or indicators already being considered to monitor the action. Moreover, the last column of the section aims to help identify actions that are related to more than one aspect of the business model and, therefore, impact several parts of the model.

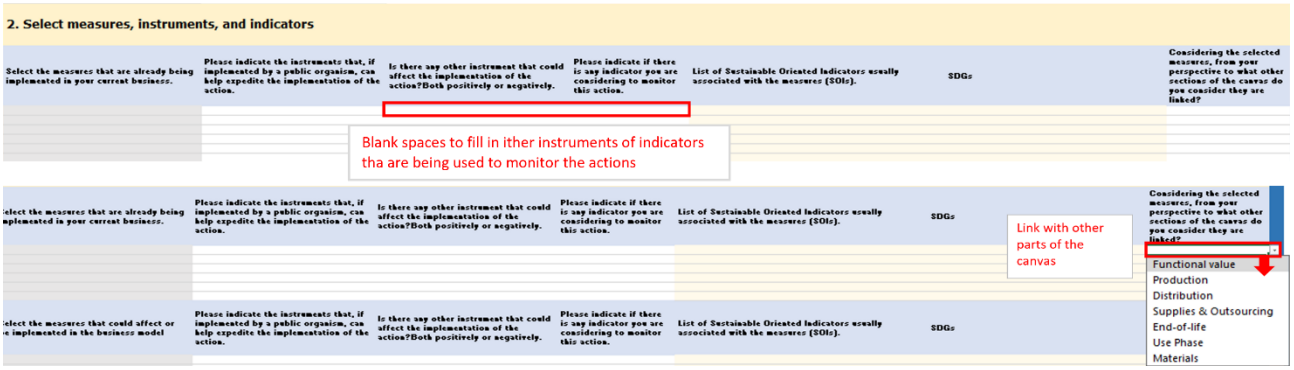


Figure 11 *Structure of the measure section. Source: own elaboration*

Finally, in case some of the actions that are being explored are not in the current database, there is a last subsection in this part that allows the introduction of other measures and relevant information associated with them.

Name of the measure	Are there any public instruments that could help speed up the implementation process?	Indicator	SDGs	Considering the selected measures, from your perspective to what other sections of the canvas do you consider they are linked?

Figure 12 *Structure of the measure section measures outside the database. Source: own elaboration*

Additionally, the canvas has two final components that reflect the benefits and impact associated with the business model.

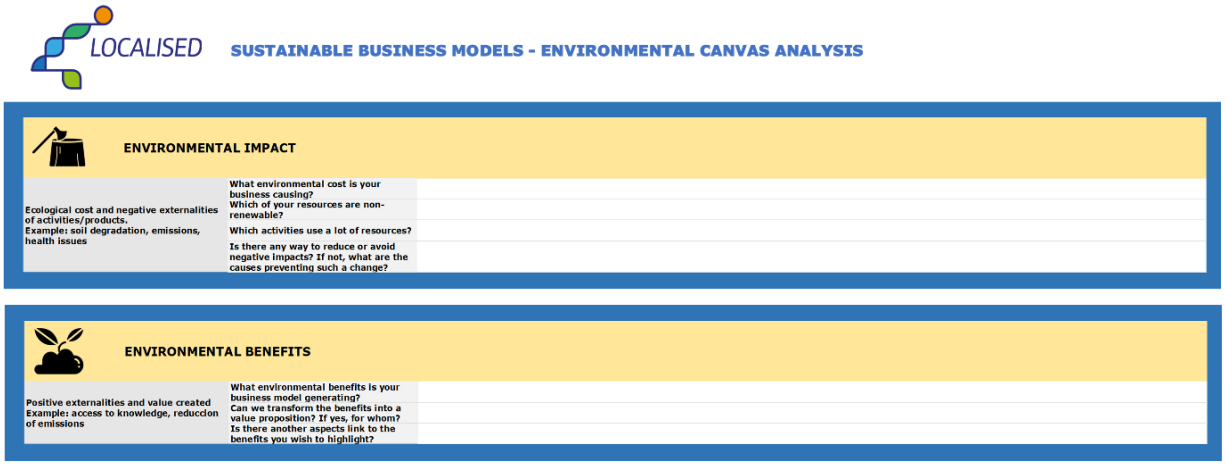


Figure 13 *Last sections of the canvas. Source: own elaboration*

Lastly, after completing all the different sections, the user will be able to see a summary of all the information in the sheet "Canvas Overview" and download the report as a pdf, including an initial picture of the impacted SDGs considering the measures selected.

Name

Agriculture

Croatia

SUSTAINABLE BUSINESS MODELS - ENVIRONMENTAL CANVAS ANALYSIS LOCALISED PDF

Current Business Characterization

Supplies and Outsourcing

What materials or activities are necessary for production processes?

0

Are there any alternative suppliers that are more environmentally friendly?

0

Considering current solutions for your supply needs, which solution is most cost-efficient and environmentally friendly?

0

Is there any solutions to avoid out-sourcing?

0

If you have alternative solutions what are the barriers that prevent you from changing the current situation?

0

Production

What key activities are necessary to implement the value proposition?

0

How can key activities be made more environmentally friendly?

0

Is it possible to optimize some of the processes? If yes, which part?

0

Is it possible to establish partnerships with more eco-friendly suppliers or local companies?

0

Are there any barriers to optimize/change the current production chain to be more enviromentally friendly?

0

Materials

What materials and human resources are necessary to implement the value proposition?

xxx

Which of them already exist, which need to be acquired, or why do partners need to be fund?

xxx

Are there any environmentally critical processes?

xxx

Can any resource be replaced or redesigned to be more environmentally friendly?

xxx

Can any resource be replaced by recycled or reused material?

xxx

Is there any resource that coud be avoided?

xxx

Are there any barriers conserning the optimization of resources?

xxx

Functional Value

What is your company's output? Why are you different and worth paying attention to?

0

What is the necessity covered? Considering its primary function, is it possible to explore other areas/services to cover other relevant necessities?

0

Does it create synergies between different stakeholders?

0

Does the product/service stimulate more responsible consumption? (e.g. car sharing)

0

Does your organization currently consider environmental aspects in any of the phases involved?

0

What are the barriers, if any, that prevent the implementation of changes (for more environmental solutions)?

0

Does your product/service contribute to improve or worsen the current climatic crisis? In which way?

0

Does your organization currently consider environmental aspects in any of the phases involved?

0

What are the barriers, if any, that prevent the implementation of changes (for more environmental solutions)?

0

Does your product/service contribute to improve or worsen the current climatic crisis? In which way?

0

Do you forsee any changes in your business considering the current climate crisis? If yes, which one?

0

End-of-life

Is the user being instructed on how to recycle or dispose of the residual products?

0

Does the product/service stimulate more responsible consumption and recycling/reusing practices?

0

Is there waste that needs to be managed at the end of life? If yes, how is currently being managed?

0

If there is some disposal at the end of the cycle, iia your company managing the residual products? If not. why?

0

Are there any other solutions to avoid disposal?

0

Is it possible to take responsibility and use the residual products to close the cycle? Is there any other use for it? Could it be a valuable product to any other company?

0

Are there any barriers to move to a more circular process?

0

Distribution

What is the scope? (local, regional, national) Are your channels integrated or is it possible to establish synergies at any level?

0

Is there any way to optimize the distribution or reduce its carbon footprint?

0

Which sales channels are more environmentally friendly?

0

Are there any distribution channels that could be replaced with an eco-friendlier solution?

0

Which sales channels are the more cost-efficient?

0

Are there any barriers to optimize/reduce the distribution channels?

0

Use phase

What are the essential resources needed to use the product/services?

0

Is energy, water, or any other utility service required?

0

Are the users instructed on optimizing its use and reducing unnecessary consumption?

0

Is there any way of optimizing the use? (e.g. reduce the necessity of other associated products/services)

0

Is maintenance a relevant aspect? If so why?

0

Is maintenance a relevant aspect? Is there any way to reduce the impact during the product's life span? (e.g. increase the life span of the different pieces, reduce consumption)

0

Do you forsee any changes in user behaviour that could affect the use of your product/service?

0

Are there any potential barriers that could affect the use of your service/product?

0

Measures, instruments and indicators integrated in the current model

0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0

Environmental impacts

What environmental cost is your business causing?

0

Which of your resources are non-renewable?

0

Which activities use a lot of resources?

0

Is there any way to reduce or avoid negative impacts? If not, what are the causes preventing such a change?

0

Environmental Benefits

What environmental benefits is your business model generating?

0

Can we transform the benefits into a value proposition? If yes, for whom?

0

Is there another aspects link to the benefits you wish to highlight?

0

Figure 14 *Full canvas overview. Source: own elaboration*

3.3.1.2. Additional information

At the end of the tool, three separate sheets are included with detailed information related to measures, indicators, and instruments to support a more detailed view of the integrated outcomes and help the user understand the context of the integrated capabilities.

3.3.1.3. Identification of relevant technologies for the key sectors

Finally, based on the work done in T7.2 (Shayegh, 2024), and with the aim of offering concrete examples of technologies being implemented in the main sectors, a series of factsheets were developed and integrated into the tool with helpful information related to those actions. Each factsheet contains a concrete example of a technology implemented and some key aspects such as description, country of implementation, financial aspects, the technology's readiness, and a link to the SDGs. Once the sector is selected in the instruction sheet, a link is activated, redirecting the user to the files. The complete list of factsheets can be found in the Annex.

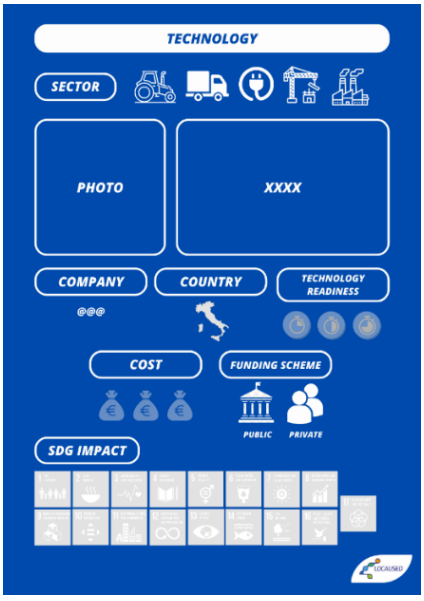


Figure 15 *Technology Factsheet. Source: own elaboration*

4. Conclusions

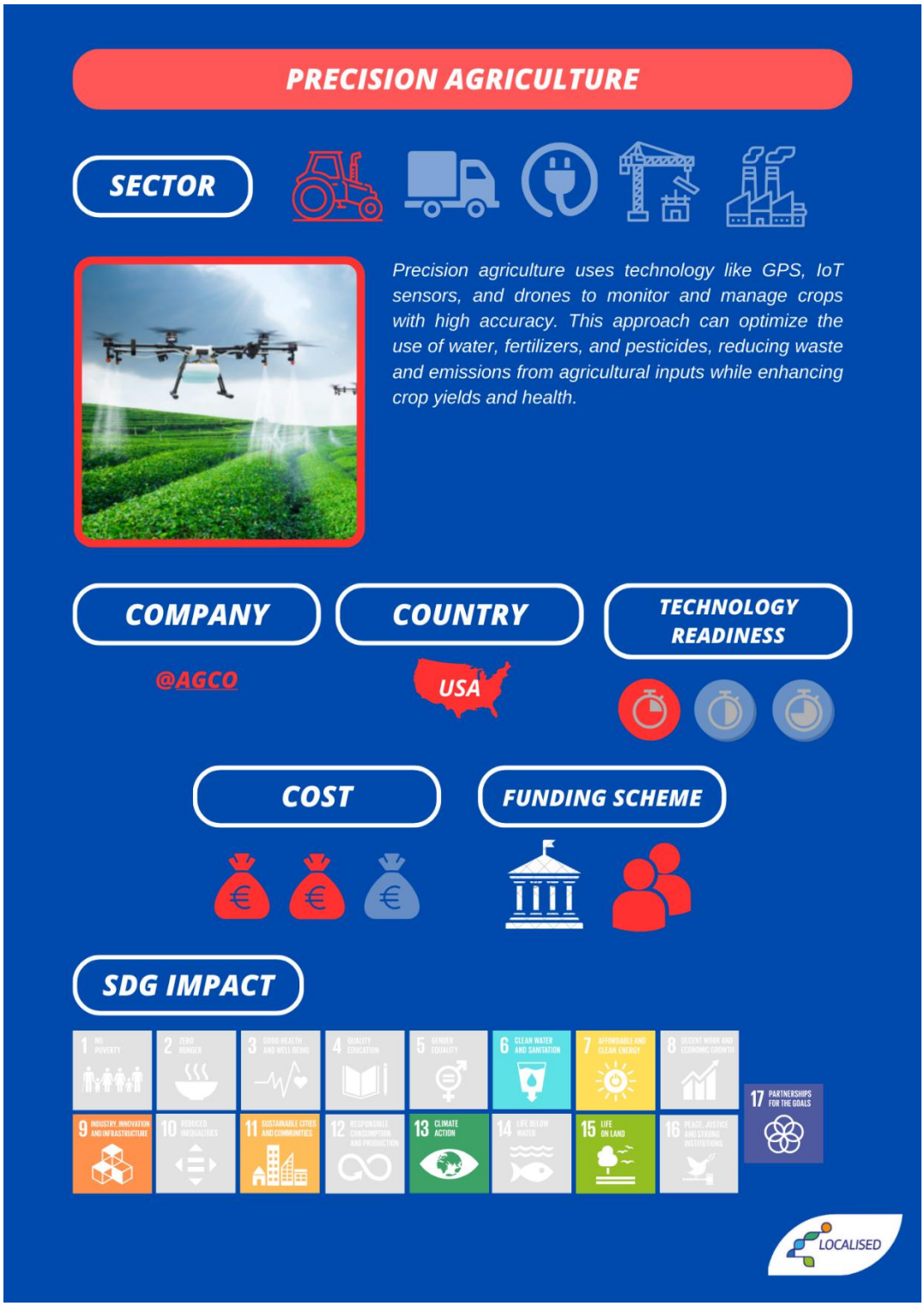
Transitioning to a sustainable business model is beneficial for the environment and society as well as for the long-term success and resilience of the business. Companies that adopt sustainable practices can differentiate themselves in the market, build stronger relationships with customers, and reduce risks associated with environmental and social issues.

The LSBCM provides companies with a structured approach to assess their current operations, identify potential gaps, and proactively adapt to evolving market and regulatory demands. In addition, the tool holds potential by consolidating various features into a unified and user-friendly platform. It merges a traditional Environmental Business Model Canvas with three comprehensive datasets of measures, instruments, and indicators while also offering exemplary technologies for each sector. This ensures that businesses, particularly those with limited resources, are equipped with a robust framework for determining their future direction. The tool can help organisations stay competitive, ensuring they align with the latest regulations and market expectations. This is particularly vital in industries such as construction, agriculture, transport, and manufacturing, where businesses are required to significantly reduce emissions and waste, adopt sustainable practices, and transition to more eco-friendly alternatives. The LSBMC can also help identify potential barriers, such as organisational inertia or technological constraints, to ensure a comprehensive analysis of the changes to address. By using the tool, businesses can implement customised strategies, foster innovation, and provide long-term competitiveness, creating economically viable, socially responsible, and environmentally sustainable value. Nevertheless, incorporating sustainability into the core of the business model is a continuous process that requires innovation, collaboration with other relevant sectors, and support from local administrations. Therefore, this resource constitutes an initial exercise to help businesses navigate this process, ensuring that sustainability becomes an integral part of their strategic planning and operations.

Lastly, as seen by the multiple project outcomes integrated into the tool, the LSBMC plays a key role in complementing and connecting other project work packages. Its integration with WP7, which includes the database of business technologies and the upcoming business vulnerability index to be implemented in WP8, ensures a holistic approach, allowing businesses to not only assess their current models but also evaluate their resilience to future challenges. Additionally, the tool is deeply linked to WP4, which developed an integrated database of adaptation and mitigation measures and instruments, enabling companies to access solutions tailored to their needs seamlessly. Finally, the connection with WP5, focused on analyzing indicators and aligning business practices with the Sustainable Development Goals (SDGs), further strengthens the

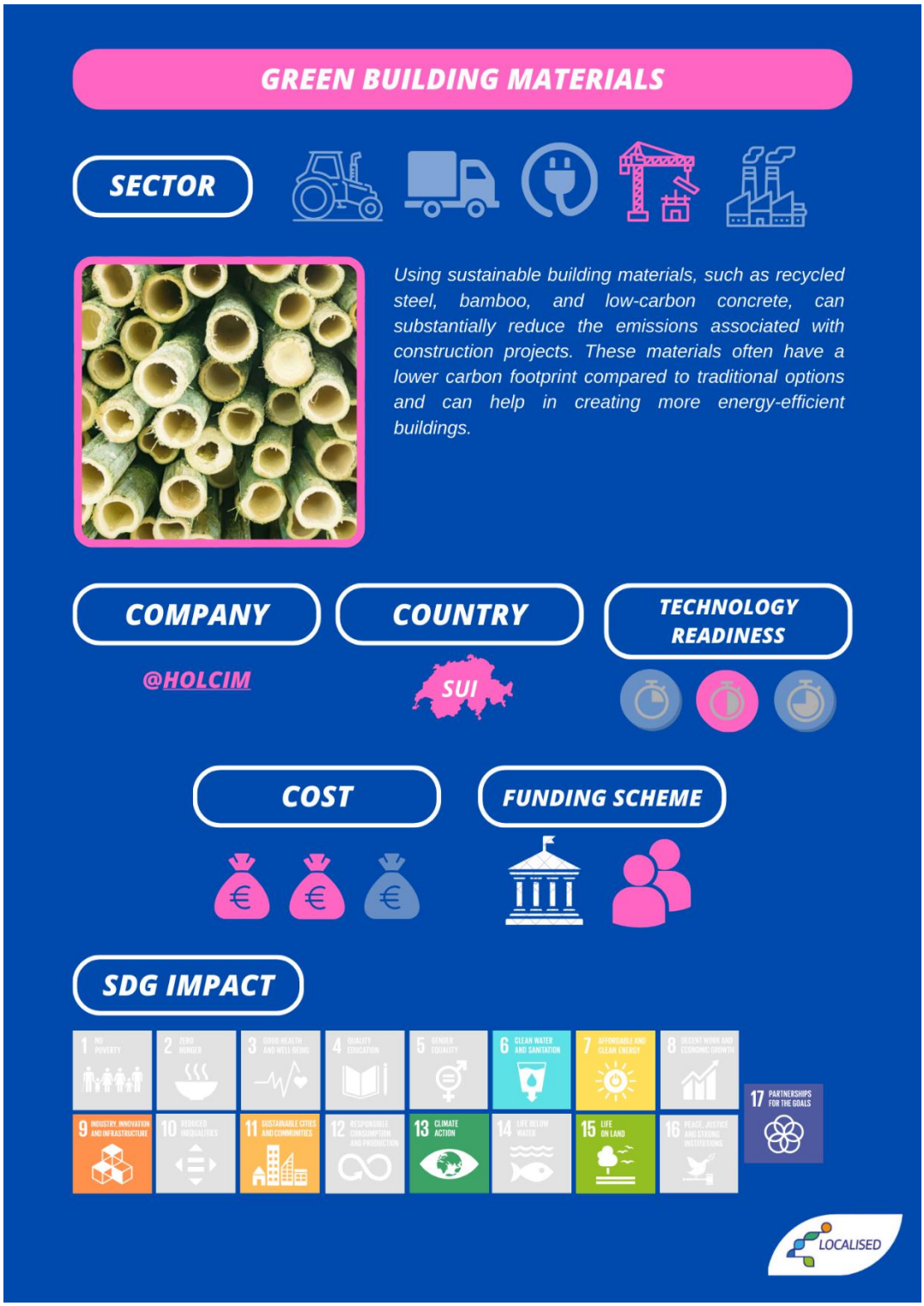
tool’s ability to guide companies in meeting both regulatory requirements and global sustainability targets.

Annex 1- Factsheets

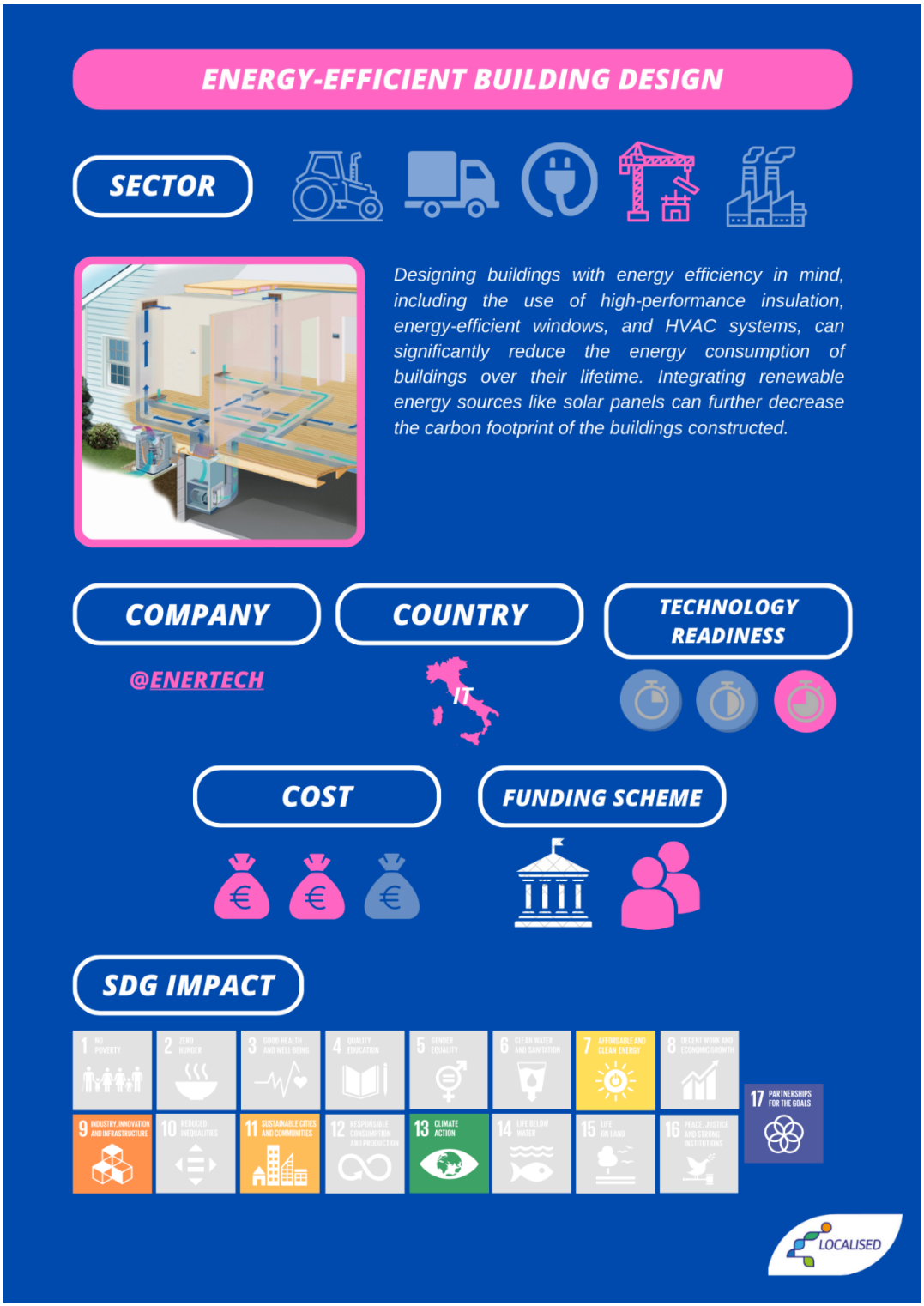

PRECISION AGRICULTURE
SECTOR
Precision agriculture uses technology like GPS, IoT sensors, and drones to monitor and manage crops with high accuracy. This approach can optimize the use of water, fertilizers, and pesticides, reducing waste and emissions from agricultural inputs while enhancing crop yields and health.
COMPANY
@AGCO
COUNTRY
USA
TECHNOLOGY READINESS
COST
FUNDING SCHEME
SDG IMPACT
LOCALISED


AGROFORESTRY PRACTICES
SECTOR
Agroforestry systems can provide windbreaks and natural pest control, reducing the need for chemical inputs and contributing to lower overall emissions from farming activities.
Agroforestry mimics natural ecosystems far more closely than monocultures do, where one single crop is grown over large areas of land. It works by letting different biological systems cooperate and flourish. This can lead to a rise in productivity, as trees and plants find ways to interact and support each other symbiotically. All of this can actively improve conditions for plants, livestock and wildlife alike.
COMPANY
@PACHAMA
COUNTRY
USA
TECHNOLOGY READINESS
COST
FUNDING SCHEME
SDG IMPACT
LOCALISED

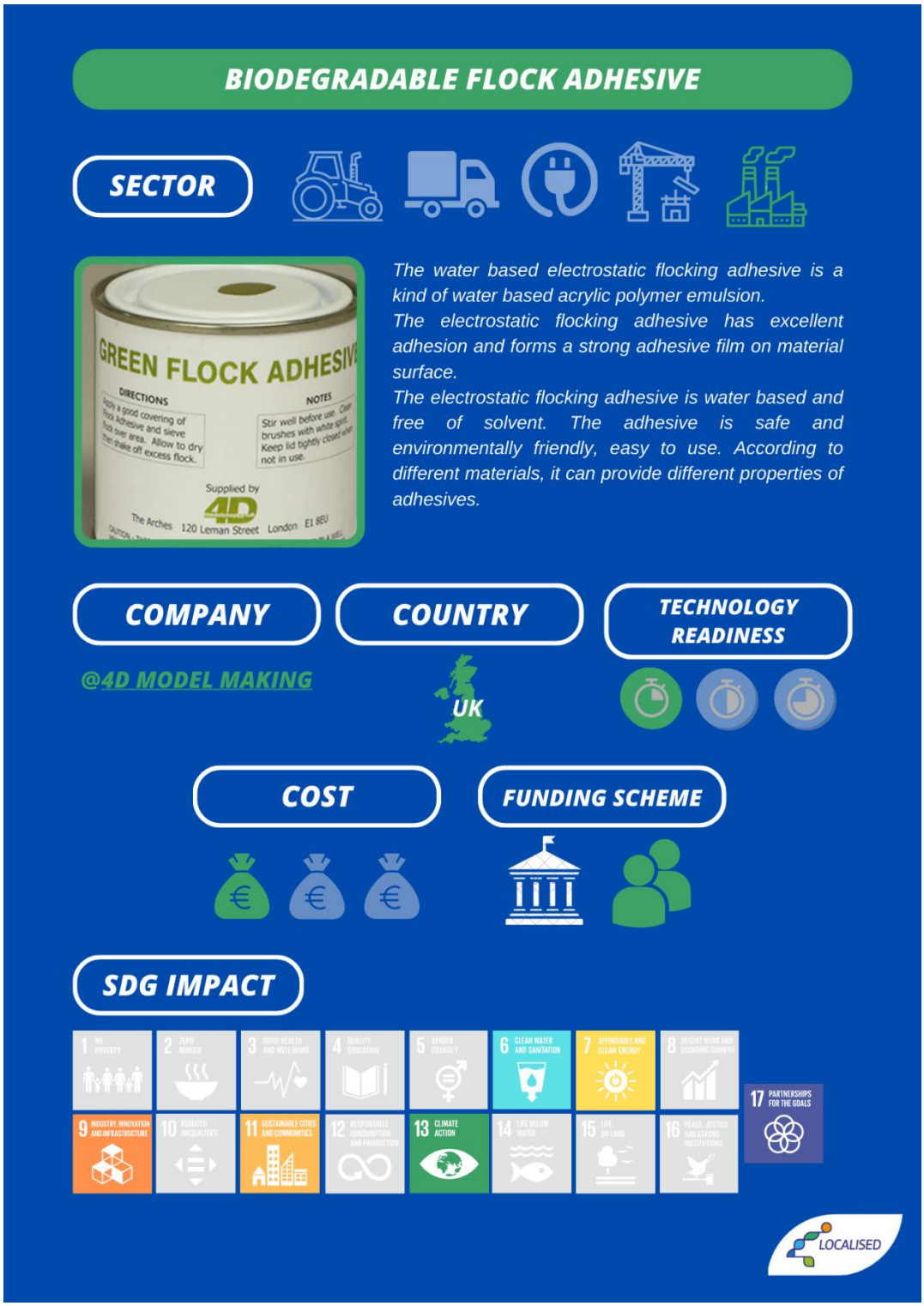

RENEWABLE ENERGY-POWERED IRRIGATION SYSTEMS
SECTOR
Utilizing solar or wind energy to power irrigation systems can reduce the carbon footprint associated with water pumping and distribution. These renewable energy systems can replace fossil-fuel-powered pumps, leading to significant emissions reductions in the apple cultivation process.
COMPANY
@GVS
COUNTRY
USA
TECHNOLOGY READINESS
COST
FUNDING SCHEME
SDG IMPACT
LOCALISED

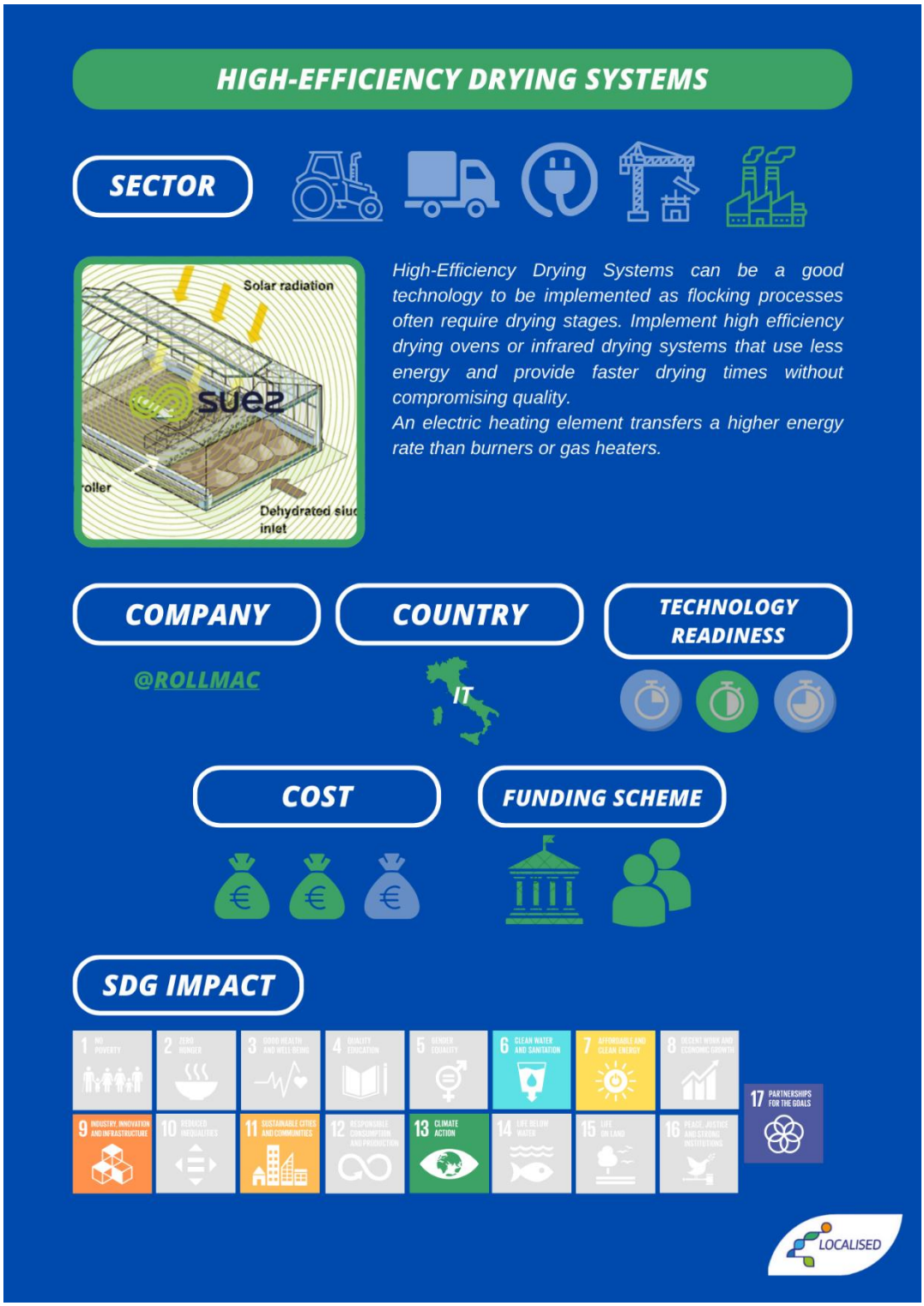

GREEN BUILDING MATERIALS
SECTOR
Using sustainable building materials, such as recycled steel, bamboo, and low-carbon concrete, can substantially reduce the emissions associated with construction projects. These materials often have a lower carbon footprint compared to traditional options and can help in creating more energy-efficient buildings.
COMPANY
@HOLCIM
COUNTRY
SUI
TECHNOLOGY READINESS
COST
FUNDING SCHEME
SDG IMPACT
LOCALISED


MODULAR CONSTRUCTION TECHNIQUES
SECTOR
Implementing modular construction techniques, where building components are prefabricated in a controlled factory setting, can enhance efficiency and reduce waste. Modular construction can lead to shorter construction times, less material waste, and lower emissions from on-site activities.
COMPANY
@ABTECH
COUNTRY
USA
TECHNOLOGY READINESS
COST
FUNDING SCHEME
SDG IMPACT
LOCALISED


ENERGY-EFFICIENT BUILDING DESIGN
SECTOR
Designing buildings with energy efficiency in mind, including the use of high-performance insulation, energy-efficient windows, and HVAC systems, can significantly reduce the energy consumption of buildings over their lifetime. Integrating renewable energy sources like solar panels can further decrease the carbon footprint of the buildings constructed.
COMPANY
@ENERTECH
COUNTRY
IT
TECHNOLOGY READINESS
COST
FUNDING SCHEME
SDG IMPACT
LOCALISED

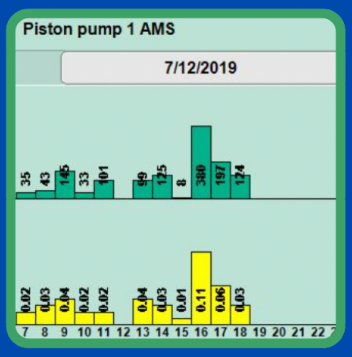

BUILDING INFORMATION MODELLING
SECTOR
Building Information Modeling (BIM) seamlessly integrates data and optimizes workflows across the entire lifecycle of a construction project, from initial planning through design, construction, and into operations and maintenance. It provides clarity, efficiency, and comprehensive support by leveraging detailed models and asset data throughout each phase of the building's life cycle.
COMPANY
@AUTODESK
COUNTRY
USA
TECHNOLOGY READINESS
COST
FUNDING SCHEME
SDG IMPACT
LOCALISED


BIODEGRADABLE FLOCK ADHESIVE
SECTOR
GREEN FLOCK ADHESIV
DIRECTIONS
NOTES
Supplied by
The water based electrostatic flocking adhesive is a kind of water based acrylic polymer emulsion.
The electrostatic flocking adhesive has excellent adhesion and forms a strong adhesive film on material surface.
The electrostatic flocking adhesive is water based and free of solvent. The adhesive is safe and environmentally friendly, easy to use. According to different materials, it can provide different properties of adhesives.
COMPANY
COUNTRY
TECHNOLOGY READINESS
@4D MODEL MAKING
UK
COST
FUNDING SCHEME
SDG IMPACT
LOCALISED


HIGH-EFFICIENCY DRYING SYSTEMS
SECTOR
Solar radiation
suez
Dehydrated siuc
inlet
High-Efficiency Drying Systems can be a good technology to be implemented as flocking processes often require drying stages. Implement high efficiency drying ovens or infrared drying systems that use less energy and provide faster drying times without compromising quality.
An electric heating element transfers a higher energy rate than burners or gas heaters.
COMPANY
@ROLLMAC
COUNTRY
IT
TECHNOLOGY READINESS
COST
FUNDING SCHEME
SDG IMPACT
17 PARTNERSHIPS FOR THE GOALS
LOCALISED

ENERGY-EFFICIENT ADHESIVE APPLICATION

SECTOR



An Adhesive Measuring System (AMS) can quickly detect when too much adhesive is being applied. The AMS is already integrated in the latest generation of melters - Vision. In addition, manual adjustment of the pump pressure by the operating personnel is also made more difficult with Vision, as a tool is required for this. The pressure applied to the melter can also be monitored with an optional system component. If the pressure drops below a minimum value, the melter switches off. The reason for a reduction in the amount of adhesive applied to the substrate becomes clearly visible. Manual intervention in existing application parameters is not necessary.

COMPANY

@ROBATECH

COUNTRY

IT

TECHNOLOGY READINESS

COST

FUNDING SCHEME

SDG IMPACT

HEAT RECOVERY SYSTEMS

SECTOR

Heat Pipe technology is used in a wide range of applications across many diverse industrial sectors. The technology is renowned for being extremely robust and able to operate in many challenging heat recovery environments for the benefit of high energy users seeking to reduce ever increasing energy costs. The combination of a unique low cost manufacturing process and patented exchanger designs ensure that the many technical advantages of heat pipe exchangers are available to industrial users wishing to reduce running costs and carbon emissions.

COMPANY

@BROOKVENT

COUNTRY

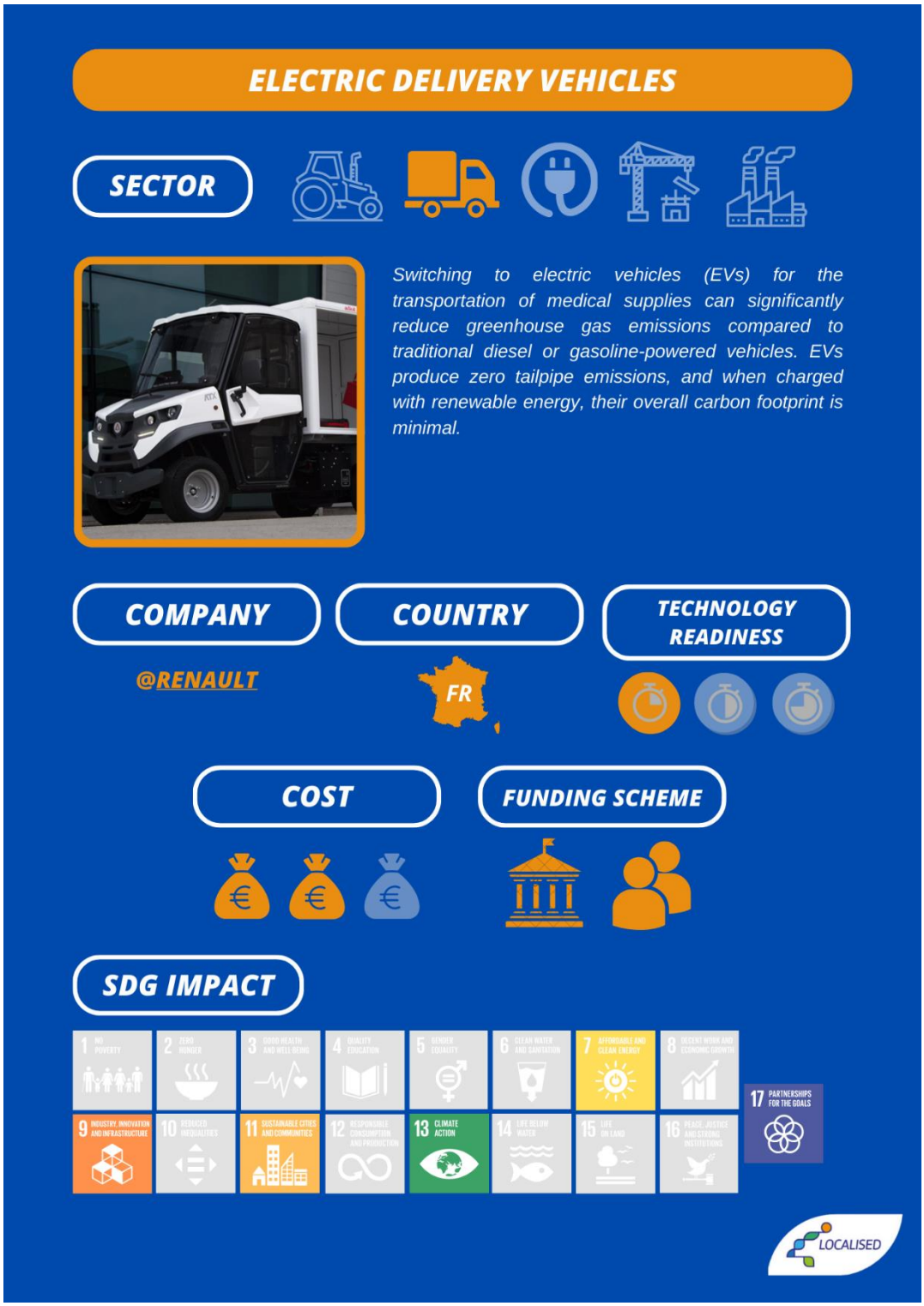
UK

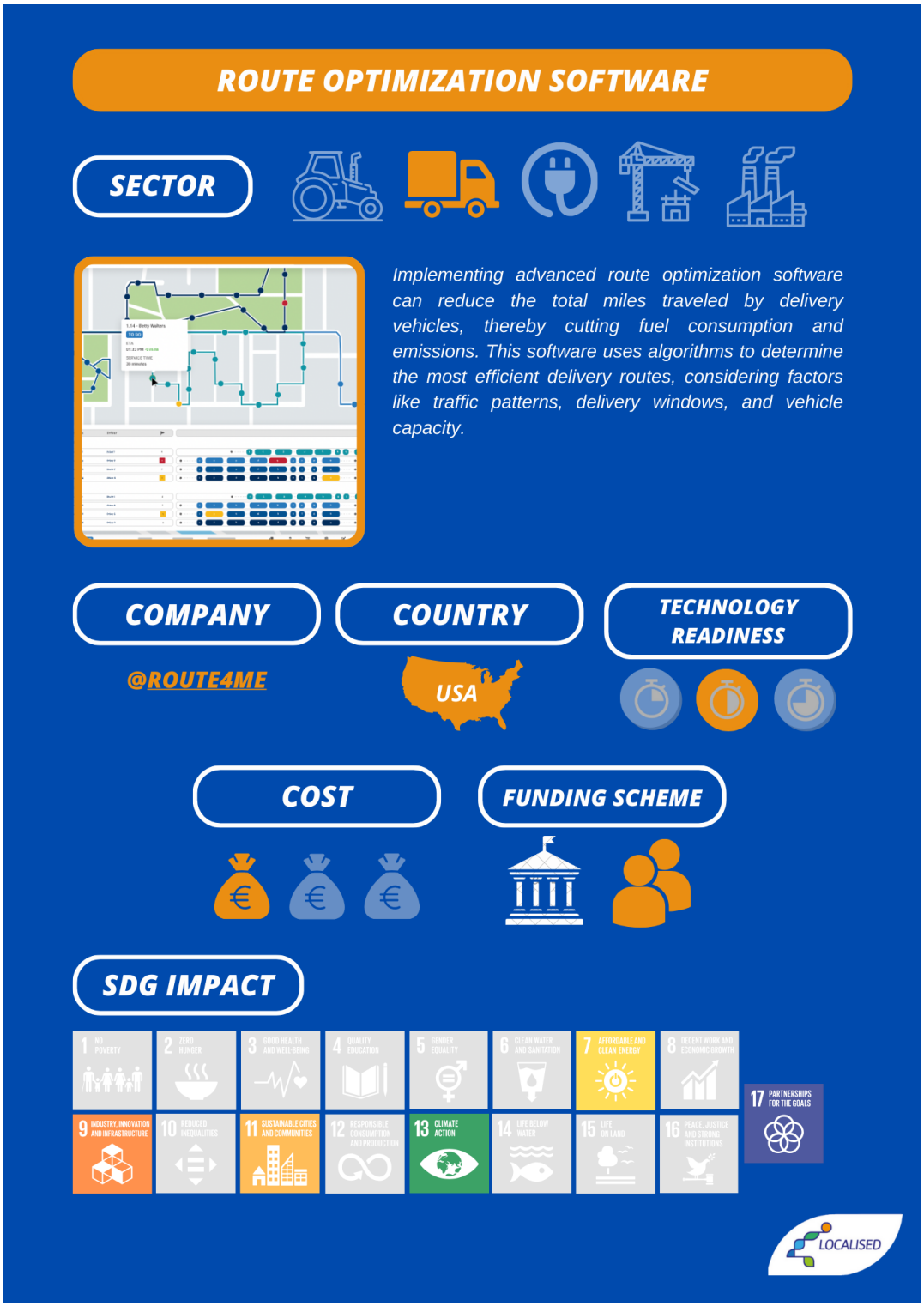
TECHNOLOGY READINESS

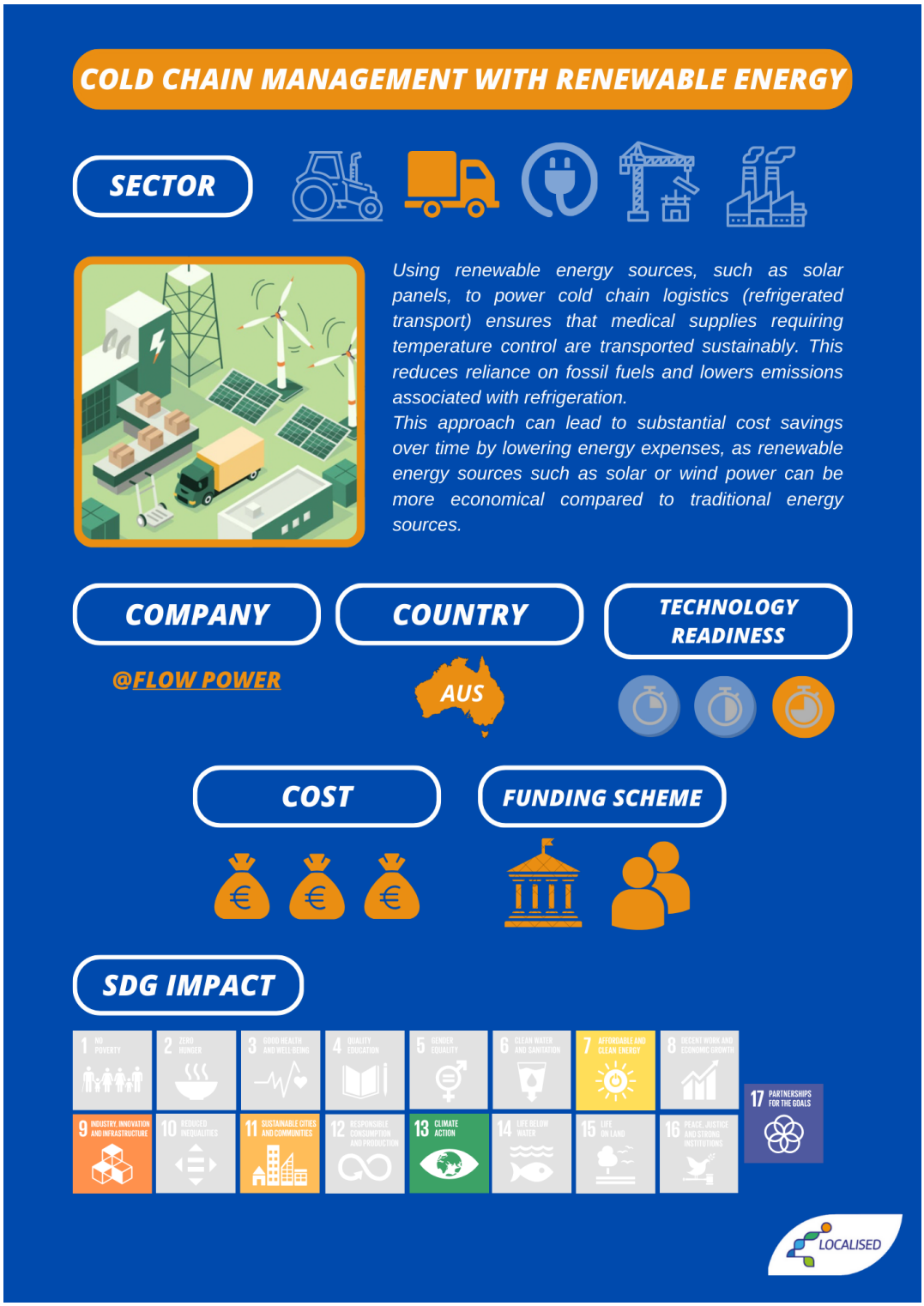
COST

FUNDING SCHEME

SDG IMPACT


ELECTRIC DELIVERY VEHICLES
SECTOR
Switching to electric vehicles (EVs) for the transportation of medical supplies can significantly reduce greenhouse gas emissions compared to traditional diesel or gasoline-powered vehicles. EVs produce zero tailpipe emissions, and when charged with renewable energy, their overall carbon footprint is minimal.
COMPANY
@RENAULT
COUNTRY
FR
TECHNOLOGY READINESS
COST
FUNDING SCHEME
SDG IMPACT
LOCALISED


ROUTE OPTIMIZATION SOFTWARE
SECTOR
Implementing advanced route optimization software can reduce the total miles traveled by delivery vehicles, thereby cutting fuel consumption and emissions. This software uses algorithms to determine the most efficient delivery routes, considering factors like traffic patterns, delivery windows, and vehicle capacity.
COMPANY
@ROUTE4ME
COUNTRY
USA
TECHNOLOGY READINESS
COST
FUNDING SCHEME
SDG IMPACT
LOCALISED


COLD CHAIN MANAGEMENT WITH RENEWABLE ENERGY
SECTOR
Using renewable energy sources, such as solar panels, to power cold chain logistics (refrigerated transport) ensures that medical supplies requiring temperature control are transported sustainably. This reduces reliance on fossil fuels and lowers emissions associated with refrigeration.
This approach can lead to substantial cost savings over time by lowering energy expenses, as renewable energy sources such as solar or wind power can be more economical compared to traditional energy sources.
COMPANY
@FLOW POWER
COUNTRY
AUS
TECHNOLOGY READINESS
COST
FUNDING SCHEME
SDG IMPACT
LOCALISED

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