

Study Report 2: Product As A Service Renewability

REDUCES – Rethinking Sustainable Development in
European Regions by Using Circular Economy
Business Models



REDUCES
Interreg Europe



European Union
European Regional
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1. Focus of the report

The report presents the second study report for the Interreg Europe project REDUCES dealing with the circular business models on “Product-as-a-service” and “Renewability”. This report is based on the 3rd interregional meeting and the presentations and discussions that took place during this event, as well as on the evaluation of the cases that was done in the weeks afterwards. The cases presented during this meeting can be categorized within the two business models mentioned.

As stated in the first report, Circular economy (CE) can mean many different things for different actors from different fields. Common denominators are designing out waste and pollution (waste reduction), keeping products and materials in use (upscaling and keeping the value), regenerating natural systems (loops, transition) and the social aspect like creating well-being.¹ This broad context requires the focus be placed on specific business models which were introduced and developed during the first REDUCES interregional meeting.

In this second report we focus on two types of business models: “Product-As-A-Service” and “Renewability”. These will be introduced in the next chapter in the context of the REDUCES project. The third chapter reports the highlights of the 3rd interregional meeting of the project. This

meeting was set to take place in Utrecht but was reorganized to an online meeting as a consequence of COVID-19 restrictions. The fourth chapter presents the thirteen good practice cases that were presented and discussed during the 3rd interregional meeting. In the weeks after the meeting, a peer review evaluation was set up between the partners. The fifth, and last, chapter is a representation of this evaluation.



REDUCES brings together six European regions.

¹ Ellen MacArthur Foundation. 2017. The concept of a circular economy. <https://www.ellenmacarthurfoundation.org/circular-economy/concept>.



2. Description of the business models

2.1. Regional background

The selected best practices within the REDUCES project are part of a project that aims to understand and improve regional policy instruments for a CE. The six regions involved in the REDUCES project have selected the following policy instruments:

- Southwest Finland: Sustainable growth and jobs 2014–2020 - Finland's structural funds programme.
- Utrecht, Netherlands: Chances for West 2: Operational Programme ERDF West-Netherlands.
- Greater Manchester, UK: Greater Manchester European Structural and Investment Funds Strategy 2014–2020.
- Valencia, Spain: DC09 Regulations on Habitability in Housing.
- Bulgaria: Operational Programme "Environment" 2014–2020.
- Maramures, Romania: Regional Development Plan of North West Region 2014–2020.

The overall common objective of the policy instruments is to adopt more environmentally sustainable ways of production, reducing the negative environmental impacts of economic development. CE business models should contribute to this objective. The next paragraphs give more

information about the business models central to this study report: "Product-As-A-Service" and "Renewability".

2.2. Business model definition

During the first Interregional meeting we concentrated on Finnish Innovation Fund's (Sitra) conceptual definition of the different Circular Economy business models which were selected for the REDUCES project. In the same manner as in the first study report on "Product Life Extension", we initially based the discussion on "Product-As-A-Service" and "Renewability" on the following descriptions by Sitra², explaining them, respectively, as 'providing services instead of products', and 'using renewable and recyclable materials as well as renewable energy in product design and manufacturing'.

These categories stem from a division of circular economy business models in five types: 1) renewability; 2) sharing platforms; 3) product as a service; 4) product-life extension; and 5) resource efficiency and recycling. In practice, it is sometimes difficult to categorize a specific company where

² For the definition by Sitra and Finnish examples, please see: <https://www.sitra.fi/en/projects/inspiring-solutions/#what-is-it-about>

several elements of different business models can be found. At the same time, it has proven useful to discuss business models that fit the category and therefor share specific elements.

The “Product-As-A-Service” business model is seen as a promising model for enabling a circular economy because it would stimulate the production of durable goods. At the same time companies will be stimulated to develop different opportunities, as well as new ways to maintain, repair and refurbish products.

“Renewability” is a promising business model because it enables the replacement of fossil fuels. Basing a business model on renewability stimulates companies to look for different resources and suppliers for both material production and energy.

The more comprehensive definitions for the two business models discussed in this REDUCES study report are:

Product-As-A-Service (PaaS)

The customer pays for certain functions or performance and avoids the risks of ownership. The total costs of ownership remain with the service provider, with revenue being earned by means of, for example, a leasing or rental agreement.

Renewability

Renewable, recyclable and biodegradable materials, as well as the principles of eco-design, are preferred for products and their design. Fossil fuels are replaced by renewable energy.



3. Third REDUCES interregional meeting

On 17th of September 2020, HU University of Applied Sciences Utrecht hosted the 3rd interregional REDUCES meeting. The event took place online. Dr. Cyrille Krul, *director of the HU research center Healthy and Sustainable Living*, opened the meeting and welcomed the participants virtually. Dr. Krul stressed the importance of research projects like Reduces because the Utrecht region and the research institution on Utrecht Science Park aim to create a healthy and sustainable urban area and also to become a circular regional economy. In his keynote, mr. Marin Zegers from the City of Utrecht also emphasized the importance of the REDUCES project for the city and the region in moving further into the direction of becoming resource efficient and completely circular by 2050. He expounded on the circular economy ambitions and policy of the City of Utrecht.

In the morning, the participants attended breakout sessions on both social enterprise and circular urban development. MOYU was presented as an example of a successful social enterprise in circular business. MOYU is a company in sustainable and circularly developed notebooks made of stone paper. The other session was about the circular urban development in particular in the project Werkspoorkwartier in Utrecht. In both sessions aspects of both cases were discussed: What is it that makes the case circular? Where does it

lead to? And how to assess and appreciate the impact made?

In the afternoon, all six regions that participate in the REDUCES project shared their best practices for the two circular economy business models central in this 3rd meeting: renewability and product-as-a-service. Participants could thus follow 2 sessions per region, in total 12 different sessions for knowledge exchange, and learn about the case examples and policy implications from Southwest Finland, Greater Manchester (UK), Valencia (Spain), Maramures (Romania), Sofia (Bulgaria) and Utrecht (the Netherlands).

The REDUCES project aims to exchange experiences and knowledge within and between the regional authorities in order to take informed action improving their policies. This is key in developing the best action plans to support environmentally sustainable business models and policy instruments in each region. Therefore, participants and moderators were asked to distill learnings from the sessions they attend. At the end of the morning and afternoon breakouts, the learnings were shared and discussed in two subsequent round-up sessions.



Based on the morning sessions that focus on the Utrecht region, 15 learnings were summed up:

1. Act regionally not locally.
2. Set ambitious goals: 100% circular in 2050.
3. Demand numbers to understand current situation and monitor goals.
4. View city as an urban mine.
5. Appoint focus areas and domains.
6. Define what circular economy is and what to do.
7. Sign deals with the private sector and dedicate budget, give responsibility, trust and freedom to initiatives from the area.
8. Aim for scaling up of initiatives.
9. Put circular economy in the bigger picture of sustainability, economy, social, wellbeing.
10. Mobilize frontrunners and newcomers.
11. Declare circular economy to be a solution to needs.
12. Spread the word and put award winning initiatives on stage to motivate others.
13. Compare and benchmark with other regions nationally and internationally.
14. Introduce circular economy thinking into regulation.

15. Involve businesses and academia in developing new policies.

The discussion after the regional knowledge exchanges lead to general learnings for action plans to support environmentally sustainable business models and effective policy instruments for each region. First, the need was identified to distinguish between long-term policy support and long-term public-private partnerships on the one hand, and the availability of seed money for startup initiatives, where short term policy support is relevant, on the other hand. Second, an important role was ascribed to governments to create and stimulate demand for circular products and services in their local communities and regions, for instance with public purchasing and procurements but also by motivating private buyers to move in this direction.



4. Selected regional GP cases

In essence, REDUCES interregional meetings are about learning CE Good Practices from each other across the Europe. In this chapter are presented the regional GP cases that were introduced during the 3rd interregional meeting in September 2020. There was more cases collected and evaluated (see part 5). More information about all the cases can be found on the REDUCES website: <https://www.interregeu-rope.eu/reduces/good-practices/>



Southwest Finland

Murtolan Hamppufarmi Oy (Renewability)

*Presenter: Virve Kettunen,
owner Hamppufarmi Oy
Moderator: Jenni
Suominen, Turku UAS*

Hamppufarmi cultivates hemp and produces different hemp products such as oil, construction fibers and cosmetics. Hemp is a fast-growing, energy-rich plant which grows even in modest conditions and does not need artificial watering or large amounts of fertilizers or pesticides.

Initially, Hamppufarmi started to grow hemp with government support for an experiment. Later, different products were added that proved more successful. Currently, the government is not involved, and the company is customer led. The product line is still growing. The success of Hamppufarmi is its value proposition of organic and sustainable products, which prove to be attractive to customers. The company has a loyal customer base. In terms

of circular economy, biological farming makes the impact relatively low, the company generates its own solar energy, and the production of the products leads to minimal waste, which in any case is biologically degradable.

Foodduck – With automation against plastic and food waste (PaaS)

*Presenter: Timo Mieskonen, Turku UAS
Moderator: Jenni Suominen, Turku UAS*

The Foodduck service innovation for spread dispensing makes mass dining areas more ecological and more hygienic as the spread dispensers are automated. Clients of Foodduck include schools, restaurants, daycare centers, hospitals and gas stations. The company leases the product, including updates, maintenance and service.

Advanced remote monitoring makes measuring benefits more visible. The design is simple and replaceable (design for disassembly): efficient materials are used, software updates are installed

via IoT, and service is planned based on IoT. Other circular effects are the reduction of food waste and food packaging waste.

Foodduck is an award winning and a certified Finnish 'key producer'. The Finnish innovation agency Sitra finds Foodduck an exemplary company, which functions as a kind of government support. Direct financial governmental support was granted for building a pilot factory.



**Buyomic Ltd
(Renewability)**

*Presenter and moderator:
Vihra Andonova*

Buyomic specializes in new generation packaging materials. The company converts organic waste from agro-production into sustainable packaging materials, applying circular economy principles for these materials. The materials used are any organic material that meets the requirements. This can be wood materials or, as in the example given, the materials left from growing mushrooms. The materials are processed, dried and pressed into packaging materials that can be used to safely transport gentle materials like glass. The materials can be used for dry materials as well as for warm and wet materials, such as food containers. Clients can choose the material and the next phase of use for the packaging after the use. It could be composting of the packaging, or the material can be used as fertilizer, depending on the choice of base material used.

Several industries showed interest in the solution. So far mostly companies and industries for luxury goods have been early adopters as they can spend relatively more funds on the packaging materials. Scaling up of production would lead to a significant lowering of the production cost, making it available to more industries. The material is

compliant with regulations for use for most consumer products.

Konica Minolta (PaaS)

Presenter: Elena Drechev

Moderator: Vessela Petrova

Konica Minolta Business Solutions Bulgaria provides optimized printing services to its customers from all over the country. The company offers step by step solutions for document processing. This entails the following: smart processing in the printers with an internet connection on each machine, making it possible to print anywhere within companies, resulting in large paper savings when unnecessary prints are not automatically printed. The machines can also signal low levels of printer toner and potential errors so the number of movements by employees for refill and maintenance has been strongly limited.

When contracts on the printers run out, the client gets the chance to either recontract the same machines at a new rate or to order a new machine. For the machines that are replaced, a secondary market is active, which means that the machines last longer than originally. The initiative has led to lower use of paper, a strong drop in kilometers travelled by maintenance employees, less machines taken out of service, and lower-level toner use.

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Maramures, Romania

Kema Tronic (Renewability)

Presenter: Ioana Bercu

Moderator: Mihaela Lite

Kema Tronic is a Romanian engineering company from Maramures, specialized in renewable energies, that has five patents in wastewater treatment (one in circular economy) and more than 200 projects all over the country. The company is strongly involved in tackling the circular principles in wastewater treatment. Its good practice on renewability is related to the advanced anaerobic digestion technology used for a major wastewater treatment plant that has increased production of renewable energy, at the same time reducing excess sludge.

By implementing the technological development, Kema Tronics tackled two issues: high operations cost, as treating wastewater required a lot of energy; and the sludge management issue, reducing the amount of sludge by 30 percent. The developed process resulted in the production of biogas that was used to cogenerate electricity and heat. From a circular economy perspective this means less waste, less CO₂, and the production of circular electricity.

An important challenge for these kinds of state-of-the-art developments is that tender documents typically ask for conventional technologies. Innovative solutions need a special approval, a significant barrier to implementing and scaling up. A useful cooperation was realized with two research institutes. There is a clear need to push this cooperation and the research associated further, research that needs long term investments from both governments, research institutions and companies.

Cepronef Energo Invest (Renewability)

Presenter: Mihaela Lite

Moderator: Margareta Capilnean

Cepronef is a Romanian company located in Maramures. Cepronef offers integrated services in architecture, engineering and consultancy in renewable energy, industry, environment and energy management. Its good practice on renewability refers to the realization of a unit for electricity production from a solar source in the benefit of a local community in Maramures, and its capitalization on the profile market benefiting from the Green Certifiers mechanism. The results include up to 20% reduction of energy costs.

Key to the success of Cepronef is its cooperation with major stakeholders, such as energy specialists, public officers and local communities. For the latter, the challenge proved to be overcoming mentalities concerning the different use of land. Transparent communication and using clear arguments helped to convince local communities about the benefits of the projects. This communication involved showing that unused land that was not appropriate for other uses (living agriculture) was used to produce energy. Besides, Cepronef showed how benefits returned to local communities involved through new investments by the local governments involved.

ONE IT (Paas)

Presenter: Nicolae Ontiu

Moderator: Mihaela Lite

ONE IT LTD is a successful business in the IT&C sector, situated in Baia Mare, Maramures County, Romania. The company has distinguished itself on the regional market by the quality of products and services and by offering personalized IT solutions for businesses. The company is also strongly involved in circular economy. Its good practice on

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product-as-a-service is 'managed print services' – integrated services that provide printing equipment with consumables included and payment only in regime per printed page.

The major benefit of the product-as-a-service business model from ONE IT is that clients do not have to invest in equipment. The specialized service by ONE IT includes monitoring equipment, data security and implementing waste reductions. Furthermore, experience shows that costs can be reduced by 30 percent.



Waste Logics (PaaS)

Presenter: Geeta Chandra
Moderator: Russell Yates

Waste Logics offers cloud-based waste management software that can be used

to manage waste operations and material flows more effectively, providing 'actionable insights from real-time data' that enable better control and evaluation of valuable waste streams. The software provides a simplified and intuitive CRM system that can be easily used by both customer/end-user and waste collector to offer transparency in how much waste is collected, where it goes, how it is utilized and the implicit costs.

Having a lot of experience from waste management, Waste Logics is able to play a major role in the transition to a more circular economy. The company enables clients to make better operational decisions on issues such as: What to do with certain waste? How to operate more efficiently? And, how to communicate with clients effectively? A future development is how to connect customers across different market places. According to Waste Logics, this network element is very interesting and has a lot of potential.

More information: <https://www.wastelogics.com>

Oldham Community Power (Renewability)

Presenter: Andrew Hunt
Moderator: Russell Yates

The Oldham Community Power project seeks to provide affordable, sustainable and low carbon energy by using both council owned and community-based buildings for solar installations. The scheme is primarily funded through a community share scheme, with secondary support through grants and loans provided by the local council.

Oldham Community Power can be seen as a kind of cooperation, working for the benefit of the community. The benefit for the community is formalized through community shares. The several initiatives have shown to contribute to a circular economy by reducing carbon emissions. At the same time customers' energy bills are reduced and funds are generated to invest in environmental community projects. A general yield is that citizens are engaged in the climate agenda.

More information: <http://oldhamcommunitypower.org.uk>



Valencia, Spain

Projar:E²STORMED project (Renewability)

*Presenter: Ana Llopis
Moderator: Javier Orozco
(UPV)*

The project realizes 'green roof' installation on a senior center (public building) for the improvement of energy efficiency and water retention. This practice shows the energy saving results of the green roof on buildings with a Mediterranean climate, evaluating also its benefits for the water management.

The overflow of water is stored in tanks for irrigation of green roofs in dry periods. The effect is particularly to lower temperature in apartments in the summer, also resulting in energy savings for air conditioning. An additional benefit is that water quality drainage is much better. A current barrier to scaling up is the lack of (public) funds and the need to acknowledge the urgency of implementing the solution by governments and customers.

Sunnerbox (Renewability)

*Presenter: Alberto Martinez
Moderator: Vera Valero*

The main objective of Sunnerbox is to take the most of solar radiation to as many uses as possible. Solar PV energy is mostly used in large photovoltaic production plants or in small-medium installations for self-consumption in homes/industries. Photovoltaic energy has great potential that could be extended to many uses and locations. With that idea in mind, the company has developed solar energy collection and storage units that can be moved and installed in different locations, allowing access to electrical energy practically anywhere.

Sunnerbox offers and sells a PV module and battery that can be used for many applications: on streets for charging e-scooters and e-steps, but also on ships, in harbours, refugee camps, camp sites, and for military applications. Several municipalities buy the boxes for urban transport. The company started without external financing and used its own investment.



Utrecht

Bouwhub (PaaS)

*Presenter: Mark Dudink
Moderator: Holger
Hooimeijer*

As one of the main construction companies in the Netherlands, Volker Wessels has set up an independent business unit dedicated to smart building logistics. This so called Bouwhub, situated at the edge of a large city, helps to efficiently and effectively bridge the last mile to the building site. The initiative not only significantly lowered CO₂ emissions for building traffic, but also allowed for an efficient reuse of building materials and waste from building sites. This for example has led to a collaboration on the reuse of wood and a marketplace for reusable building materials in several cities.

The initiative has led to two developments. The pilot has led to an integrative initiative to building logistics for the whole company. It has also led to changes in the construction value chain, leading to less waste and a strong reduction of CO₂. In terms of circularity, the newly planned Bouwhub in the region Amsterdam will be completely circular. Volker Wessels has also started collaboration with the waste management company Beelen to reuse materials from the building sites, either as building materials or furniture made from usable waste material. This furniture is made by people with low employability.

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Sympany (Renewability)

Presenter + moderator: Holger Hooimeijer

Sympany, a social enterprise for the recycling of clothing, has developed several circular initiatives for the reuse of clothing from the materials that cannot be sold. The company collects clothes and fabrics and separates the collected material in grades of resalable clothes and potential streams for reuse. The company has developed a partnership to develop new cotton thread from reconstituted cotton from clothes and fabric no longer fit for integral reuse. This initiative follows several other ventures for blue jeans and shoe soles. In the blue jeans venture, Sympany provided the processing partner with jeans materials that the processing partner refitted to isolation matting.

In the venture in which Sympany is a shareholder, in 2019 the company broke even after ten years of development and market making. In most ventures Sympany provides several resources: streams of material from their operations that have no value in their primary activities, know-how and networking skills. Most ventures include technological partners that help transform the material from Sympany to new materials for future use.



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A photograph of two women with blonde hair, one wearing a green scarf and a striped shirt, looking at a laptop screen. The background is a solid yellow wall.

5. Evaluation of selected GP cases

REDUCES evaluates the collected good practices applying the methodology defined at the beginning of the project. The goal of the evaluation in the project is to assess the quality of the Circular Economy business cases in the contexts of their environmental impact, replicability and up-scaling potentials. It is also done to get a better picture of the CE practices in the partner regions and their impact in transitioning to sustainable economies. The evaluation highlights the success factors of different business cases, crucial for replication and up-scaling in different regions.

5.1. REDUCES evaluation framework and evaluation result

In order to assess the potential impact of each good practice collected, an evaluation framework was devised, including assigning indicators to demonstrate potential impact of each GP. The REDUCES assessment framework is structured around the UN Sustainable Development Goals (SDGs) and their targets. The UN Sustainable Development Goals indicate the most relevant global sustainability challenges of the moment, ranging from poverty and justice and to climate change and environmental degradation. There are 17 interconnected Goals and the UN tries to

achieve them by 2030.³ Applying a methodology by Schroeder et al. (2018)⁴, the most relevant Goals in relation to the circular economy were identified. Each GP was evaluated in relation to the SDGs, with additional indicators outside the SDGs assigned to a GP when needed. Mapping of the goals showed that the REDUCES Product as a Service and Renewability Good Practises mostly contributed to the following SDGs:

- SDG 4 Quality Education: The goal aims to ensure high quality and availability of education for everyone. SDG 4 aims to substantially increase the number of youth and adults who have relevant skills, including technical and vocational skills, for employment, decent jobs and entrepreneurship.
- SDG7 Affordable and clean energy: The goal aims to ensure access to affordable, reliable, sustainable and modern energy for all. The goal includes for example a target for renewable energy share in the total final energy consumption.

³ United Nations. Sustainable development goals. <https://www.un.org/sustainabledevelopment/sustainable-development-goals/>

⁴ Schroeder, P., Anggraeni K., and Weber, U. 2018. The relevance of circular economy practices to the Sustainable Development Goals. *Journal of Industrial Ecology*.

- SDG 8 Decent work and economic growth: The goal is to promote inclusive and sustainable economic growth, employment and decent work for all. The goal includes for example a target for decent work for all women and men, including for young people and persons with disabilities, and equal pay for work of equal value.
- SDG 11 Sustainable cities and communities: The goal aims to make cities inclusive, safe, resilient and sustainable. The goal includes for example a target for reducing the adverse per capita environmental impact of cities, including by paying special attention to air quality and municipal and other waste management.
- SDG 12 Sustainable consumption and production patterns: The goal aims to ensure sustainable consumption and production patterns. The goal includes for example a target for substantially reducing waste generation through prevention, reduction, recycling and reuse.

Particular emphasis was placed on the following aspects of the GPs applying an impact scale from 1 to 3 (low-medium-high):

- Potential sustainability impact
- Potential for upscaling
- Potential for replication

A peer review was conducted between partner regions to allow for a thorough analysis of the sustainability impact of each GP and to validate the conclusions made by the partner submitting each GP on each of the stated aspects. A joint online meeting was then held to discuss the evaluation results in the Evaluation Coordination Team (ECT). These conclusions are summarized to the following pages case by case.

5.1.1. Product-as-a-service

ONE-IT – Circular economy through Managed Printing Services (Maramures, Romania)

Estimating potential impact of GP (SDG indicators reflected)

By implementing the "Managed Printing Services" solution offered by ONE-IT, an economic agent or a local authority can outsource the printing activities, thus saving up to 30% of the initial costs of printing. The major benefit of this product-as-a-service business model is twofold: clients save on the usage of paper and do not have to invest in equipment. This will prevent waste, thereby contributing to the goal of ensuring sustainable consumption and production patterns. On the short term this means less paper waste and on the long term a reduction of electronic waste. In addition, the partnerships ONE-IT sets up with its clients can be seen as a cooperation to in waste management. It was concluded that this business model entails **medium** potential to obtaining SDGs by advancing sustainable production and consumption. In addition, the ONE-IT business model was estimated to have a **low** impact on creating new companies and some more jobs.

Potential for up-scaling

Offering printing services is a well-known practice and widely applicable. The potential for upscaling is great as the service can be easily offered to many partners. This could happen both within the region and beyond since a lot of the service can be done from a distance. Thus, the potential for upscaling was estimated to be **high**.

Potential for replication

The ONE-IT business model is easy to replicate to other regions or countries. However, it might be that many regions already have companies that offer these kinds of services, and the market is saturated. Therefore, the replication potential was estimated to be **medium**.



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A&C Ferma Agricola – Necessary equipment for cultivating the land (Maramures, Romania)

Estimating potential impact of GP (SDG indicators reflected)

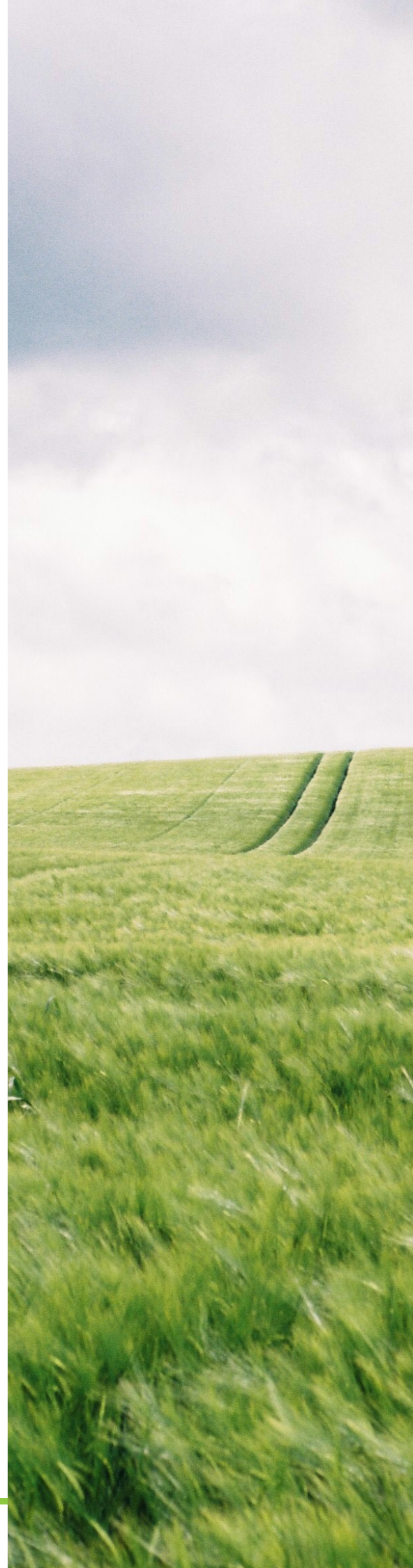
With its product-as-a-service business model, Ferma Agricola rents out equipment for agricultural activities. The company can offer full packages of agricultural works for the establishment, maintenance and harvesting of agricultural crops. In addition, they provide seeds, fertilizers, herbicides and phytosanitary products. This service enables the small agricultural companies Ferma cooperates with to innovate and create sustainable growth, including more jobs. For the companies involved the impact is high, but considering the fact that these are small companies, the overall potential impact on reaching SDGs was assessed to be **medium**. In addition, in the long term this business model will lead to less material use and less waste. When considering the hypothetical situation of all 40 companies (thus far) involved, this business model has a medium impact on advancing sustainable production and consumption patterns.

Potential for upscaling

The business model seems to be easily scalable to other partners/businesses. It would mean more investment in equipment for Ferma. Upscaling will have a limit, though, due to the need to transport heavy equipment to clients. One option for scaling up could be to establish new branches in different communities, which would entail a completely new investment in equipment. Overall, due to the physical limitations, the potential for upscaling was estimated to be **medium**.

Potential for replication

In principle, the Ferma business model is replicable to other regions. It might however be the case that there is a saturated market as similar services do exist in other regions. The replication potential was therefore estimated to be **medium**, but for regions where these kinds of services do not exist the impact could be great. Only a new servicing company is needed that can invest and then find partners to cooperate with.



Konica Minolta – Business Solutions for sustainable printing (Bulgaria)

Estimating potential impact of GP (SDG indicators reflected)

Konica Minolta Business Solutions Bulgaria provides optimized printing services to its customers from all over the country. The practice focuses on the fact that companies do not need the devices themselves (printers), but their products - prints and scanned images. The company offers complete solutions, based on a three-step model: consulting, implementation and management. It is a combination of software and hardware. Through the analysis, costs are optimized and as a result, companies save money on these services (the largest savings are 40%). In this practice, the customer does not care to keep consumables in stock - they are sent to him automatically, as the devices are monitored remotely. In case of outage, there is a notification to the customer centre and the service engineers of Konica Minolta.

Although the practice contributes to reducing waste (the number of prints due to improper use of equipment is reduced), reducing emissions (the number of km travelled for maintenance is reduced), and it reduces costs for businesses, it does not contribute to reducing prints themselves. The improved CE attitude/knowledge of the company should however be noted and positively evaluated as they actively try to incorporate CE principles to their business. Overall, the practice appears to be aligned with the goal of ensuring sustainable consumption and production patterns. It was concluded that this practice has **medium** potential impact on reaching SDG goals.

Potential for upscaling

The practice has already been scaled up nationally in Bulgaria. When estimating the potential of transfer to other product lines (e.g. healthcare, measuring instruments, Industrial Inkjet) developed by the company, it does not seem easily transferable. Hence, the overall upscaling potential was concluded to be **medium**. On the whole, however, as a practice this type of a business model is widely scalable.

Potential for replication

The practice has great potential to be replicated in other regions. It is an international company based in many regions. Developed solutions (hardware / software) should be easily implanted in other regions. Thus, the replication potential was concluded to be **high**.

Iwell – Stored renewable energy at home (Utrecht, the Netherlands)

Estimating potential impact of GP (SDG indicators reflected)

The company Iwell provides smart battery services for building societies, investors and apartment managers to store renewable energy, either produced on site or from somewhere else to power communal facilities in buildings. This example of product as a service contributes to lowering costs and also to lowering the use of “outside” electricity and grid connection by helping smooth peaks in electricity use. The practice ensures access to affordable, reliable, sustainable and modern energy for all by increasing

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capacity of energy storage (40 batteries in 2018). Therefore, the potential impact on reaching the SDG goals on energy use in this good practice was estimated to be **medium**.

Potential for upscaling

The batteries used to store electricity obtained from solar sources have potential to be used in social housing flats, in buildings that have a limited capacity to collect solar energy. The battery unit is an investment that currently pays itself back in lowering the energy and connection costs for objects. However, it still comes at a steep price for individual consumers and owners' associations thinking about using renewable energy. By providing a product as a service (lease) model, the product becomes affordable for smaller units. Iwell has made partnerships with providers of solar energy and wind energy as well a supplier of solar panels. On the demand side, it is partnering with building societies to implement the Iwell solutions in apartment buildings. It has also branched out to industrial project collaborations to use the Iwell solutions to store and smartly distribute energy for industrial appliances. It was concluded that the upscaling potential is **high** mainly for big buildings, where the costs are divided among a significant number of flats, as well as for industrial buildings.

Potential for replication

The case provides insight into the combination of a product developed in the region, a business model and entrepreneurship of the company. The company has designed the product and produces the product locally in a building provided through local policy. This entails local workplaces in production of circular products.

The business model allows residents or other building users to manage their collective electricity use and the production of electricity, either at the premises or from durable outside sources. This can be done either by buying the product, or by using it as a product-as-a-service (financial lease).

The company shows entrepreneurship by finding and developing new markets for the product. This is done by collaborating with energy transition partners that have fluctuations in their energy use. Overall, the potential for replication is concluded to be **medium to high**, depending on the partnerships and co-operation that the company will establish in the future.



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Green Carpet Oy – mobile carpet laundry service (Southwest Finland)

Estimating potential impact of GP (SDG indicators reflected)

Green Carpet Mattopalvelut Oy provides sustainable mobile carpet laundry service for companies. The aim is to provide high-quality carpet solutions and “just on time” carpet washing services at the customer’s locale. In doing so, the service saves a significant amount of water (3 liters compared to a usual 20-25) and has demonstrated remarkable success despite being a small operation with just a handful of employees. If scalable, the business could have significant potential to add to local economies and water savings, although its employment impact may be limited by the small number of people it is able to successfully operate with. The business does contribute to healthy and resilient cities by helping to keep businesses premises clean and safe, however it is believed that this is of only a minor impact. Likewise, the business may contribute to sustainable consumption patterns by extending the lifespan of office carpets, however a life-cycle analysis would be required to understand the full impacts of the business, including wastewater management from the business and the impact of microfibers produced in the washing process. Overall, it was concluded that the case has **medium-low** potential SDG impacts.

Potential for upscaling

This is an innovative business providing a novel service and there is no reason it cannot be scaled up to businesses across Finland or the international market. Expansion into the home market is another opportunity that might hold potential. Scalability is likely to be a factor of the ambition and drive of business management and the market appetite for the product. A driven sales team targeting HR and Health and Safety and Environment departments may also be key to helping the business expand further. Overall, it is concluded that the business case has **medium** level potential for upscaling.

Potential for replication

Unless there are patents on the technology, it could be possible for other businesses to copy the idea. That said, it is an innovative business and copying the technology may be difficult, or there may be no appetite to do so. Being the first to market with the innovation, the company has the opportunity to attach its brand to the technology so that they become synonymous with mobile carpet cleaning and the preferred provider for businesses. Overall, it is concluded that the business case has **medium-high** replicability potential.

Foodduck – reducing plastic and food waste with automation (Southwest Finland)

Estimating potential impact of GP (SDG indicators reflected)

Foodduck is a service innovation for automated spread dispensing which claims to make environmental savings and increase hygiene, predominantly at schools, day care centers, restaurants and areas with self-service, such as hotels. The company’s claims are based on the savings of spread that occur through traditional means by controlling serving size and reducing the materials used in packaging of

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traditional spreads. The product may save water in terms of washing of cutlery, but the product itself likely needs cleaning daily and so will be associated with its own water usage. In terms of sustainable consumption and production, a life cycle assessment is required to establish for claims as materials used in individual spreads (spread and packaging wastes) will be offset by energy use of the Foodduck, and plastics and metals used in its construction. Overall, it is concluded this case has **medium** potential impact to SDGs.

Potential for upscaling

A sales team that is able to demonstrate long-term cost and environmental savings to customers is likely to be key here. Linking with hospitality accreditation schemes such as Green Key could perhaps be a beneficial way to do this. The ability of the product to track materials used (and presumably savings) is likely to be a powerful tool in assisting with this. When pursuing international expansion, the business may have to navigate different food hygiene rules, whilst fostering behavior change from direct customers and end users is also a likely challenge. The company could investigate different revenue stream/customer relationships to help drive business – for example product lease rather than sale, or partnering with a spread provider to provide its own raw product via long-term subscription models that would ensure long-term use of the product. Overall, it was concluded this practice has a **high** potential for scalability as the product could be expanded to canteen environments globally, particularly e.g. schools where the Foodduck branding may fit well (certain high-end restaurants may be less likely to be drawn to the brand).

Potential for replication

This is a relatively simple business model, but one with an innovative technology that (depending on patents) is likely to be difficult to copy by competitors. Thus, the replication potential for the product was considered to be **low-medium**. A major competitor could emerge from some of the customers the company is likely to target, e.g. a major hotel chain with significant resources could look to develop its own automated spreader.

Vaatepuu – clothing for rental (Southwest Finland)

Estimating potential impact of GP (SDG indicators reflected)

Vaatepuu is a “clothing as service” model business that encourages women to invest in quality products and lending rather than seeking quantity and buying of clothing. The business is a rental scheme through which customers are able to have a rotating wardrobe of quality products without having to burden the planet with production and consumption of clothing and associated materials. Impacts on water are likely to be positive, particularly in the manufacturing phase, however if items are worn more than usual, amount of wastewater from washing may increase. Moreover, it may be that clothes are washed on return, but also washed before being worn. In terms of jobs, the business is growing well, however this is dependent on the turnover of rental materials – i.e. whether the clothes are returned shortly after receipt, or whether people keep them for a long time. The business is also likely to create jobs locally. However, at a global level, if the business was to grow those jobs would likely be taken from emerging economies where clothes are manufactured. Hence, it was concluded that this business has a **medium-high** potential impact to SDG goals.

Potential for upscaling

This is a great and innovative business model. The challenges to its success are that of obtaining clothes, and customer expectations on shape/quality may hold it back. It is suspected that scalability is limited by wider societal demand for new vs reused clothing. However, this is a growing market, and the business should do what it can to drive this movement by acting as a steward of sustainability to help drive demand for used clothes. A further barrier to scalability could be that there are already competitors in this market. Overall, it was concluded this business model entails **medium** potential for upscaling.

Potential for replication

This is a novel business model but one that could be copied by others. Indeed, there is no shortage of businesses that already offer the same service. It was thus concluded this case has a **high** level of replicability.

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Waste Logics – optimizing waste management with data (Greater Manchester, United Kingdom)

Estimating potential impact of GP (SDG indicators reflected)

Waste Logics provides a 'track and trace' system that uses data aggregation to provide information about the value chains of waste management, thus making it possible to reduce landfill waste. The service is cloud-based and it used to manage waste operations and material flows more effectively. The aggregated and analysed data for instance helps in optimising the routes for the waste fleet each day, making them more cost effective for the client and the environment, with evidence from the data. The system enables a high annual waste recycling rate (74 %,) and based on measurements tens of thousands of tonnes of CO2 has been saved from the waste. Thus, it was concluded that the potential on the SDGs' of reducing pollution and waste is **high**.

Potential for up-scaling

The feasibility of the practice as a business model has been already been proven in the UK and company has potential and plans to expand further in Europe. It was concluded that the potential for upscaling for this practice is **high**.

Potential for replication

This kind of resource flow management system is highly beneficial around the world in optimising waste operations and management. The cloud-based system enables its easy applicability from everywhere. It was concluded that the potential for replicability for this practice is **high**.

5.1.2. Renewability

Kema Tronic – Innovative technology for wastewaters and sewage sludge treatment with energy cogeneration (Maramures, Romania)

Estimating potential impact of GP (SDG indicators reflected)

Kema Tronic is a wastewater treatment company in Maramures, Romania. The company has been developing technologies to enable functioning in a circular economy. With implementing the technological development in its major wastewater treatment plant, Kema Tronics has tackled two issues: 1) high operation costs, because treating wastewater requires a lot of energy; 2) and the sludge management issue, reducing the amount of sludge by 30 percent. The first aspect results in more efficient use of resources via production of electricity by a high-efficiency cogeneration system. Energy is still needed, but the improvement in efficiency is assessed as having a medium impact on the business. The second aspect has had a significant impact on waste management and waste reduction for the communities the company works for. Overall, it was concluded that the business model has **medium** potential impact measured by SDGs.

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Potential for upscaling

As long as more wastewater is available and can be transported to the facility, the business can be easily scaled up. When the treatment takes place at a different location, a new facility (wastewater treatment plant) and will be needed. The knowledge can of course be transferred, but this limits the potential for upscaling. Thus, the potential for upscaling was estimated to be **medium**.

Potential for replication

In theory, the technology seems to be easily transferrable. This would mean that other/similar plants can learn from Kema Tronic and implement the technology and lessons learned. At the same time, it was identified that tender procedures typically ask for conventional technologies, limiting the uptake of these kinds of circular innovations. Next, it seems that cooperation with (local) research institutes aided the development and implementation, meaning that this is also something that has to be set up. So, while in theory the replication could have a great potential, in practice it is was assessed as having **medium** replication potential due to the above-mentioned requirements.

Cepronef Energo Invest – Focus on circular economy: Solar energy for local community (Maramures, Romania)

Estimating potential impact of GP (SDG indicators reflected)

Cepronef offers integrated services in architecture, engineering and consultancy in renewable energy, industry, environment and energy management. Its good practice on renewability refers to the realization of a unit for electricity production from a solar source in the benefit of a local community in Maramures, and its capitalization on the market benefiting from the Green Certifiers mechanism.

The investment from this example resulted in the availability of sustainable energy and energy saving of up to 20 percent. Therefore, the impact on access to and use of sustainable energy is great for the communities involved. This objective has been obtained by Cepronef by establishing cooperation in energy use and energy efficiency in a local community. For this community, the impact is obviously huge, but since it is limited to one community (at this time) the impact was rated as medium. There is some benefit to the growth of the company, however it was concluded that this practice has **medium** potential impact measured by the SDG of sustainable production and consumption.

Potential for up-scaling

The business model can be easily scaled up to other communities, as long as there is demand for energy. The company has quite some potential to grow. A limiting factor is the investment needed in cooperation with local stakeholders, such as energy specialists, public officers and local communities. Due to this latter aspect, the potential for upscaling was estimated to be **medium**.

Potential for replication

The business model can be easily replicated in theory, but the investment in involving stakeholders is substantial. Besides, in other regions there will be other initiatives taking place. Still, they can learn and benefit from the lessons from Cepronef by focusing on the community, being very transparent and including people in the implementation. Similar to the potential for upscaling, the potential for replication was thus assessed to be **medium**.

Traditional houses with eco-design, brought back to life (Maramures, Romania)

Estimating potential impact of GP (SDG indicators reflected)

Maramures County Council, together with the Order of Architects of Romania – North-West Branch, organized an architectural competition for the best traditional housing solutions. The major aim was to raise awareness about and preserve the local cultural heritage and traditional architectural style typical to the region. Traditional houses with an eco-design approach are available free of charge to interested persons, thus reducing the design costs and the time to obtain building permit, and also offering the guarantee of quality projects. For the projects realized, the potential impact on efficient use of natural resources can be great as long as eco-design is applied. As a side note it should be mentioned that as these are single projects, it is unclear what the concept of an eco-design entails. Overall, it was however concluded that the business model has **medium-high** potential impact measured by SDGs.

Potential for upscaling

A great advantage for upscaling is that the architectural designs can be easily spread. Anyone who wants to realize housing can cooperate with the Maramures County Council and make use of the eco-designs. The upscaling potential was therefore considered **high**.

Potential for replication

The Plan for Revitalization of Maramures Village is a good practice to be replicated by other regions in promoting and supporting innovative solutions to combine tradition, history, authenticity, and communion with nature. The success of the initiative is ensured through public-private cooperation, significant promotion of local tradition and sustained efforts to attract local and foreign investors. The idea of a contest can be easily replicated to other regions. However, for different regions a different design will be needed in order to fit the local heritage. The potential for replication was therefore estimated to be **high**.

Biomyc Ltd – New generation packing materials (Bulgaria)

Estimating potential impact of GP (SDG indicators reflected)

In Bulgaria, up to 60% of the waste deposited at the landfill comes from the packaging of mainly fast-moving food and household goods. Biomyc Ltd addresses the problem by offering fully biodegradable, sustainable alternative packaging materials for the food industry. The start-up company's main objective is to develop environmentally friendly, biodegradable packaging materials from agro-industry waste. The process and products are well established. The competition of the established oil-based products (plastics) is strong and will be so in the coming years however bio-based plastics are becoming an increasingly better alternative.

The practice promotes sustainable consumption and production patterns: the need to recycle waste is becoming key for consumption and production. New recycled packaging is one of the most relevant alternatives for this SDG. The high production volume and lack of automation also validate CE job creation. Overall, it was however concluded that the business model has **medium-high** potential impact measured by SDGs.

Potential for upscaling

The potential to scale up this type of a practice is significant due to the huge plastic waste figures Bulgaria (and most EU countries) and the enforcement of waste recycling measures. The upscaling potential was therefore considered **high**.

Potential for replication

The practice is applicable in other regions as the raw materials used are available everywhere and production lines can be installed in different places. The technical process is mature, there are high volumes of plastic waste available and there is a growing need for recycling plastics. The potential for replication was therefore estimated to be **high**.



Nasecomo – Fish and animal food from organic waste (Bulgaria)

Estimating potential impact of GP (SDG indicators reflected)

Nasecomo has developed a process for producing proteins for pet (fish) food from organic waste. The practice demonstrates protein production based on processing of organic food waste by insects – Black Soldier Flies. Insects reproduce fast and are very efficient in gaining body mass, thus minimizing protein production costs.

Nasekomo applies the principles of circular economy to responsibly upcycle agro-industry by-products into animal protein, oil and fertilizer. The possible cooperative activities for this BP are also very relevant due to the high availability of organic waste and possible consumers. The practice thus promotes the goal of ensuring sustainable consumption and production patterns and combats climate change by facilitating waste reuse in a very sensible process reducing the carbon footprint of organic products. Nasekomo's production limits the carbon footprint of the feed industry and provides an organic alternative to chemical fertilizers. Overall, it was concluded that the business model has **high** potential impact measured by SDGs. The number of FTE CE jobs was considered **small-medium** due to the lack of direct intervention on the process.

Potential for upscaling

Plastic waste figures for Bulgaria (and most EU countries) are huge and the need for enforcement of waste recycling measures urgent. The upscaling potential was therefore considered **high**.

Potential for replication

The process applied by the practice is mature, there are high volumes of organic waste available and there is a growing need for protein when feeding fish. The potential for replication was therefore considered **high**.

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Murtolan Hamppufarmi Oy – hemp as a sustainable renewable material (Southwest Finland)

Estimating potential impact of GP (SDG indicators reflected)

Murtolan Hamppufarmi Oy is a company located in SW Finland in the municipality of Marttila that cultivates hemp and produces different hemp products. Hemp is regarded a sustainable material in that it is durable and less environmentally intensive to grow than other materials. The practice appears to save water; however, this claim is not adequately evidenced with data. The use of solar energy at the business facilities is evidence of a business committed to sustainability, however it is not particularly associated with the wider business model of using hemp as a resource. The primary benefits of the organization are the claimed benefits of using hemp as a material. These are not adequately evidenced through data in the practice but could potentially lead to reductions in waste and consumption from wear and tear of clothing. The products are, however, still subject to influences of people desiring new products even before the old has become unusable. Overall, it was concluded that the business model has **medium-high** potential impact measured by SDGs.

Potential for upscaling

Hemp is a significantly underused material with lots of potential for scaling up in numerous product markets. Scalability is likely held back by the stigma associated with hemp. To be effective, the business could therefore benefit from wider attitude and policy change. The business could further scale up and enhance its sustainability by looking to alternative business models associated with the rental of clothing rather than sale alone. Overall, it was concluded that the business has **medium** potential for upscaling, owing to the fact that it could be copied by others, particularly if this business proves successful at changing regulatory issues surrounding the material.

Potential for replication

The business model appears to be simple and similar to those of existing clothing manufacturers, the primary difference being a deep environmental focus that is evident throughout the organization. This is good to see and a great example of a good practice, easily replicable by competitors. It was concluded therefore that the business model has a **high** potential for replicability.

Sympany: Renewable thread from recycled cotton (Utrecht, the Netherlands)

Estimating potential impact of GP (SDG indicators reflected)

Sympany collects old clothes and textiles for resale and repurposing, recently focusing on a circular approach through circular applications of cotton fabrics. Every year in the Netherlands 245 million kilos of clothing and textiles are thrown out. Sympany and other involved parties collect 90 million kilos of that stream and Sympany has the infrastructure to process 16,5% of the textiles thrown out. It was concluded that this practice has **medium** potential impact measured by SDGs in The Netherlands, e.g.

to sustainable consumption and production and, specifically, to substantially reducing waste generation through prevention, reduction, recycling and reuse.

Potential for upscaling

The business model of Sympany, related to the circular repurposing of recycled cotton, was built in 40 years and has a significant potential to be extended, due to the increasing volume of textile waste and the variety of materials. Sympany has used its experience in social entrepreneurship to develop a network for alternative uses of collected materials that cannot sell on the secondhand market. The company has managed several projects in which waste has been repurposed for new markets: e.g. rubber in shoes to rubber tiles; denim/cotton to insulation materials. The challenges refer to covering the extra costs of sorting and logistics, processing the raw materials and finding a distribution chain. It was concluded that the upscaling potential of the business case is **high**.

Potential for replication

The initiative can be transferred from and to any area, as long as the requirements for the partnerships are met. The waste stream can be potentially profitable, and any initiative will take at least 5 years to yield returns. A success factor is the involvement of municipalities and non-profit organizations to collect old clothes and fabrics through recycling containers. The transferability can be also achieved through EU funding: the company is hosted by an industrial park supported by ERDF. Challenges refer to the sorting process of materials in terms of quality and variety, getting inhabitants to recycle more of the textiles that are now still thrown out as waste, as well as contamination of the inflow of materials as some people use the containers for waste disposal. The potential for replication was considered to be **medium**.





Vitens – New business development (Utrecht, the Netherlands)

Estimating potential impact of GP (SDG indicators reflected)

Vitens, one of the main drinking water providers in the Netherlands enriches and develops valuable side products from the production of drinking water. Sediments, gasses and trace materials that are pumped up or recovered from the filtration process are repurposed. The side products are then sold in selected markets or reused in the primary process. The increase of reuse of valuable sediments and trace material is proving a steady evolution and also the amount of energy produced from the gases is high. This and the need for these kinds of practices made the potential impact measured by SDGs to be considered **high** via reducing the use of natural resources.

Potential for upscaling

The practice entails many challenges. Keeping drinking water reservoirs clean can be a challenge when by-products are stored on-site. Also, Dutch law limits the extent to which the water companies can pursue commercial activities. These limit potential upscaling of the development of more products and processes (at least in the Netherlands). Therefore, it was concluded that the upscaling potential of this practice is rather **low**.

Potential for replication

Vitens has made new business development a critical success factor to its vision to provide clean and affordable drinking water while providing valuable resources to the foodchain in the Netherlands and Europe. Therefore, it was concluded that this good practice can be replicated to some extent, especially in regions that are using the same process of drinking water cleaning. It was concluded that the replication potential of this practice is **medium**.

OKAMBUVA – Prefabricated rice straw modules for sustainable building construction (Valencia, Spain)

Estimating potential impact of GP (SDG indicators reflected)

Okambuva Coop good practice on renewability refers to healthy and sustainable bio-construction, both for new constructions and refurbishments. It is specialized in straw bale and wooden structures as well as raw earth construction techniques. For securing sustainability, the Okambuva team also provides a data sheet with technical-environmental characteristics and offers training for self-construction. The prefabricated modules of straw and wood are suitable e.g. as insulating structural walls for bio-construction.

The realization of the bio-construction activities has a great impact on reducing of CO₂ emissions through reduced carbon footprint (tons reduced 22-880t/year), on and reducing waste from agricultural residue and other (20-800t/year). The practice thus ensures sustainable consumption and production patterns. The cooperative structure of the business, the possibility to source the raw materials locally and to realize self-construction processes also contribute to job creation and recovery of local economies by using local materials. It was thus concluded that the business model has a high potential impact measured by SDGs.

Potential for upscaling

Buildings built with these types of modules are usually private houses. Public administrations could take advantage of these type of modules to be used in public spaces and buildings such as schools, libraries, community centers, and they could be included with a positive score rating in public tenders. Applying agricultural residues in the construction sector involving local cooperatives was therefore considered to have a **high** potential for upscaling.

Potential for replication

The presented business model is applicable to many regions. Buildings built with these types of modules can be both private and public, new or refurbished. The raw material is available practically in all regions of Europe. The potential for replication was therefore considered **high**.

SUNNERBOX: Extend the use of photovoltaic solar energy to all possible uses wherever they are located (Valencia, Spain)

Estimating potential impact of GP (SDG indicators reflected)

SUNNERBOX provides units using photovoltaic solar energy for different applications varying from charging stations for personal mobility vehicles, from different outdoor events' electricity providers to making use of existing, temporary roofs in the cities to produce and store renewable energy. The Sunnerbox is equipment which can be placed in different places and for different purposes with the only aim of taking advantage of solar radiation to a greater extent. It was considered that the practice

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has a **high** potential impact on reaching SDG goals since it increases the share of renewable energy in the total energy consumption. The practice also provides a possibility to replace fossil fuel generators used for providing electricity for open air events and encourages the use of electrical vehicles in the cities. As such, it contributes to the reduction of harmful gases such as CO₂, NO_x, SO_x, PM₁₀, PM₁₅ that directly affect the immediate surroundings.

Potential for upscaling

The business model has the potential to be upscaled in the region and also on a national level if the companies providing the equipment grow in capacity and advertise their activity. Thus, the practice was considered to entail **high** potential for upscaling.

Potential for replication

The business can be applied in different regions. It has however certain limitations depending on the local regulations with regards to installation of this type of equipment. For this reason, it was concluded that the practice has **medium** potential for replication.

PROJAR – Green roofs (Valencia, Spain)

Estimating potential impact of GP (SDG indicators reflected)

This good practice demonstrates the possibility to use flat roofs for extensive green roof installations. On a 330 sq.m. roof of a Senior Center, a public building located in Benaguacil (Valencia), a green roof installation was developed for improvement of energy efficiency and storm water management of the building. 5000 litres of water are saved yearly through the storm water management system applied, thus having **high** impact on advancing the SDG goal of sustainable water management.

The building insulation provided by the green roof installation impacts the thermal behaviour of the building and reduces the energy consumption of the air conditioning system, mainly in the summer in a Mediterranean climate. This is why the model can be regarded as having potential for **high** long-term impact on the goal of ensuring access to affordable, reliable, sustainable and modern energy for all through energy savings induced by better environmental insulation.

The green roof also provides a new green place in the building, with plants that help to decarbonise housing stock. Living comfort is improved at the building and cities. The practice contributes to reduced carbon footprint and waste reduction and as such offers **high** potential impact on ensuring sustainable consumption and production patterns.

Potential for upscaling

The practice entails potential to be scaled up, provided there is sufficient funding available (municipality/regional/national). The regulatory framework also needs to support this type of energy production.

The feasibility of the practice shows low rate on return of investment, which is however a major barrier to applying the practice. For this reason, the overall potential for upscaling was considered **medium**.

Potential for replication

The practice can easily be replicated elsewhere provided there is funding available as well as policy support for such schemes. Thus, it was concluded the practice has a **high** potential for replication.



Oldham Community Power - renewable energy community (Greater Manchester, United Kingdom)

Estimating potential impact of GP (SDG indicators reflected)

Oldham Community Power presents a model for community owned renewable energy where the community provides finance, and the financial benefits remain with the customers. The model seeks to provide affordable, sustainable and low carbon energy by using both council owned and community-based buildings for solar installations. Mainly because it is a very limited and small practice, it was concluded that this case has **low** potential SDG impact in the Greater Manchester region to inclusive and equitable quality education and lifelong learning opportunities, as well economic growth. However, it was noticed that this practise has **medium** potential impact on ensuring affordable energy and making cities sustainable and inclusive.

Potential for upscaling

This practice entails ample potential to be scale up, provided there is sufficient funding available (municipality/regional/national government funding would be anticipated for the scheme to be transferred). The regulatory framework also needs to support this type of energy production. The feasibility of the practice as a business model is also dependent on its profitability. It was thus concluded that the potential for scaling up this practice is **medium**.

Potential for replication

The practice can easily be replicated elsewhere provided there is funding available as well as policy support for the scheme. It was concluded that the potential for replicability for this practice is **medium**.

5.2. Transversal success factors

The transversal success factors of each GP were reviewed in more detail by carefully assisting the interview process of businesses with a list of aiding questions based on eight factors presented in an article by Rizos et al 2016⁵. This list of questions aims to assist the project partners in examining in more detail why a particular good practice has proven successful. Transversal factors also aim to shed light to the possible connecting success factors and learning points between five different CE business model types examined during the REDUCES project. Three questions concerning transversal factors that may have played a role in the success of the practice were posed to the interviewees and these factors were then analyzed jointly on all the GPs.

The main success factors that arose in relation to the **product-as-a-service** business models were the following:

- **Company cultures/values** in 4 GPs
- **Customer Green consumer preferences/customer base/customer profile** in 4 GPs

And the main success factors that arose in relation to the **renewability** business models were the following:

- **Company cultures/values** in 6 GPs
- **Leadership/individuals within the company** in 8 GPs and
- Availability of relevant CE funding/local green award schemes/grants in 6 GPs.

In the REDUCES regions, in both of these CE business models, it seems that company values have a significant role in the success of the business. In the renewability cases leadership/individuals within the company were also brought up several times. While traditional linear economy still

dominates the global markets, no business can survive without the company's shared values, relevant networks and competent people supporting and leading the business into a new emerging circular economy. In addition, the readiness for innovation is essential in the transition from traditional business models to circular ones, and the innovation lies in the brilliant minds of both start-ups and seasoned professionals, which are both represented in the REDUCES cases.

Some of the business case owners brought up the fact that their product-as-a-service cases were benefitting from **new digital opportunities** like apps, webstores and ways of collecting and analysing data. Digital services help especially in optimizing the use of the product and widen the service options and make them easily replicable. The modern customer is also looking for digital non-material solutions, which can be observed in the answers where many of the case owners valued green consumer preferences high in their factors contributing to the success of the cases. Especially in the renewal energy cases, it became clear that the role of policies and authorities and their attitudes is important for the success of the renewal energy business case. Innovative ways of using existing and new infrastructures, like intermodality, were emphasised.

5 Rizos V., Behrens A., van der Gaast W., Hofman E., Ioannou A., Kafyeke T., Flamos A., Rinaldi R., Papadelis S., Hirschnitz-Garbers M., and Topi C. 2016. Implementation of Circular Economy Business Models by Small and Medium-Sized Enterprises (SMEs): Barriers and Enablers, Sustainability 2016, 8, 1212.

