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## Cradle to Cradle Certified™

Cradle to Cradle Certified™ is a comprehensive certification program that evaluates the environmental and social performance of products and materials. It assesses them based on five categories: material health, material reutilization, renewable energy and carbon management, water stewardship, and social fairness. The certification ensures that products are designed with the intention of being continuously recycled and reused, eliminating the concept of waste. It promotes the use of safe and sustainable materials, encourages renewable energy sources, and emphasises responsible water management. By focusing on the entire lifecycle of products, Cradle to Cradle Certified™ drives the development of circular solutions that prioritise sustainability, resource conservation, and social well-being.

Cradle to Cradle Certified™ in a company generates different values: it provides environmental leadership by showcasing commitment to sustainability and circular practices, the certification differentiates products, boosting market competitiveness. It drives innovation and product improvement while mitigating regulatory and consumer risks, it enhances brand reputation, building trust among stakeholders.

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## Global Organic Textile Standar

The Global Organic Textile Standard (GOTS) is a leading certification and labelling system for organic textiles. It ensures that textiles, from raw material sourcing to manufacturing, meet strict environmental and social criteria. GOTS requires fibres to be certified organic, prohibits harmful chemicals, and sets standards for water and energy usage. It also promotes fair labour practices and safe working conditions. GOTS certification provides transparency and assurance for consumers, supporting sustainable textile production, reducing environmental impact, and promoting social responsibility.

The value of the GOTS enhances reputation, attracts eco-conscious customers, improves operational efficiency, ensures compliance with sustainability standards, and fosters transparency in the supply chain. It provides a competitive advantage and taps into the growing demand for sustainable textiles, leading to long-term profitability and a positive impact on the environment and society.

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## LEED (Leadership in Energy and

LEED is a globally recognized certification program for sustainable building and design. It promotes energy efficiency, water conservation, indoor air quality, and materials selection. By adopting LEED principles, buildings achieve higher performance, reduced environmental impact, and improved occupant health.

LEED certification brings numerous benefits to companies, including cost savings, increased property value, improved employee well-being, talent attraction, market differentiation, regulatory compliance, incentives, enhanced brand reputation, and progress towards sustainability goals.

LEED certification provides significant environmental value. It promotes energy efficiency, water conservation, sustainable materials, waste reduction, improved indoor air quality, ecological site design, transportation alternatives, and environmental education. By incorporating these practices, LEED helps combat climate change, conserve water resources, reduce waste, create healthier indoor environments, protect natural habitats, promote sustainable transportation, and raise environmental awareness

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## The Forest Stewardship Council

The Forest Stewardship Council (FSC) is an international, non-governmental organization dedicated to promoting responsible management of the world's forests. Since its foundation in 1994, FSC has grown to become the world's most respected and widespread forest certification system.

FSC's pioneering certification system, which now covers more than 200 million hectares of forest, enables businesses and consumers to choose wood, paper and other forest products made with materials that support responsible forestry. FSC is a global network of members, staff, certificate holders, promotional license holders and responsible consumers.

FSC certification ensures that products come from responsibly managed forests that provide environmental, social and economic benefits. FSC certification can improve market access, demonstrate to investors and stakeholders that management practices meet objectives for responsible forest management, and provide evidence to customers that products are sourced from well-managed forests.

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## Recycling of artificial turf

Patented state-of-the-art technology to separate worn-out artificial turf into raw, clean components, which can then be re-used or recycled in the turf industry or in other industries. Through a combination of mechanical and chemical processes, the used turf is shredded, and its components, such as synthetic grass fibers, infill materials, and backing, are separated. The fibers are melted down into pellets for reuse in manufacturing, while the infill can be repurposed in construction or landscaping. Technology separate every part of the worn-out synthetic turf into rubber granules, sand and plastic fibres. The technology is so effective that almost 100% of the components can be either reused or recycled.

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## Infinited Fiber technology

Infinited Fiber technology is an innovative and sustainable solution for textile production. It involves the conversion of cellulose-based materials, such as waste cotton or paper, into new high-quality fibers. The process begins with the breakdown of the cellulose, which is then transformed into a liquid solution. Through a controlled regeneration process, the cellulose is spun into continuous fibers that can be used to create a wide range of textiles. This closed-loop process significantly reduces the environmental impact of textile production by minimizing waste and reducing the need for virgin resources. The resulting fibers are soft, durable, and can be recycled repeatedly without loss of quality, making them a valuable contribution to the circular economy.

The closed-loop process ensures that the fibers can be recycled repeatedly without losing their quality, reducing the need for new fiber production and decreasing waste generation. Additionally, the technology eliminates the use of harmful chemicals and reduces water consumption compared to traditional textile production methods. Overall, the solution contributes to resource conservation, waste reduction, and a lower environmental footprint, promoting a more sustainable and circular approach to textile manufacturing.

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## 3D Printing

3D-printing or additive manufacturing plays a significant role in the future and fits perfectly in a circular economy that is regenerative by design. It brings economical as well as ecological advantages. From a circular economy perspective the main supportive characteristics and are:

- More efficient material use as less waste is generated in order to produce parts. Most residual waste can be re-used and if printed on-site, less resource intensive mass production is needed and less products/parts needs to be kept on stock as it can be created on the spot.

- Components lasts longer and are lighter as more durable three-dimensional structures can be created that can only be made with the use of additive manufacturing. These more complex structures cannot be fabricated with the use of injection mounding or any other machining processes.

- No complex or long supply chain is needed as parts and products can be created on the spot. No large stocks and warehousing are required either. True just-in-time manufacturing makes cheap labor products from lower wage countries less attractive

3D printing technology has proven effective in recent years in enabling companies to embrace distributed production, which in itself comes with environmental benefits such as improved process efficiency, reduced waste, and decreased emissions from transportation. 3D printed parts, especially those made from biodegradable materials (bioplastics), are recyclable. When a product or part is no longer functional or needed, it can be either reused for new parts or disposed of without causing harm to the environment, making 3D-printed parts truly circular.

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# Blockchain

Blockchain technology is applied in a digitalized workflow to create shared, transparent, and more secure processes. It works like a chain of blocks in which all nodes are connected to each other, so it guarantees the traceability of any process, creating a unique registration network that reduces risk and costs.

The primary benefit of blockchain is as a database for recording transactions, but its benefits extend far beyond those of a traditional database. Most notably, it removes the possibility of tampering by a malicious actor, as well as providing these business benefits:

- Time savings. Blockchain slashes transaction times from days to minutes. Transaction settlement is faster because it doesn't require verification by a central authority.

- Cost savings. Transactions need less oversight. Participants can exchange items of value directly. Blockchain eliminates duplication of effort because participants have access to a shared ledger.

- Tighter security. Blockchain's security features protect against tampering, fraud, and cybercrime.

Blockchain in business for example: water and waste management company Suez uses blockchain to record all the stages involved in transferring sludge from waste water onto agricultural soils.

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Blockchain is ideal to help in that circulation task, identifying and monitoring materials and components right through the supply chain so that they can be either reused, remanufactured, or (when that is no longer possible) recycled or composted. There is also some evidence that it can contribute to the regeneration of nature.

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## AgriNet (AN) / Farmers Busines

AgriNet (AN) is a company that's business is about helping farmers make their farms even better. They've got a bunch of cool tools and a community of farmers working together to improve their farms. It's kind of like a club for farmers, where they share their knowledge and resources to help each other succeed.

What makes AN stand out is how they're creating a big community of farmers who help each other. It's not just about getting help; it's about sharing what you know too. Farmers can learn from each other's experiences and even buy things together to save money. It's a smart way to make farming more affordable and successful.

But here's the coolest part: AN's approach isn't just about farming; it's about the future of farming. By working together and sharing resources, farmers can make agriculture more sustainable and ready to implement of Circular Solutions. They're like a big team working to grow food in a way that's good for the planet.

In simple terms, AN is a fantastic resource for farmers that's all about making farming smarter, more cost-effective, and eco-friendly. It's like a supportive farmer's club that helps everyone succeed and grow food in a way that's good for the earth. It's the way forward for farming!

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## Re-match

Re-Match offers municipalities, sports arenas and stadiums an environmentally friendly and cost-effective way of disposing of worn-out artificial turf. It is a by-product of any sports centre having turf, as it needs to be regularly maintained and replaced to ensure the quality of the pitches and the game. Re-match, based on this regularity, realises its business idea. Re-match's good cooperation with municipalities and sports centres such as arenas and stadiums is extremely important from a business perspective. It is through this cooperation that they gain their only and main customers.

Re-Match offers state-of-the-art technology that enables artificial turf to be recycled. A world first, the ground-breaking technology separates worn-out artificial turf back into its original raw components. Later on they can be used on new pitches or in other production cycles. The worn-out turf is downsized, dried, separated and cleaned – without using water. It is done in an efficient, high-tech plant in Herning, Denmark. The result is four clean secondary raw materials without creating additional waste, meaning that minimal waste is created. The clean sand, rubber and grass fibres are of the highest quality and are regularly tested by an external institution. Re-Match is able to separate every millimetre of worn-out artificial turf into rubber pellets, sand, plastic and backing. The technology is so efficient that up to 99% of the components can be recycled.

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## THE REBRICK PROJECT

Reuse of bricks significantly reduces the amount of building waste that is generated, and brick reuse in buildings saves the environment significant amounts of the CO<sub>2</sub> used for baking new bricks. Gamle Mursten upcycles bricks to create more beautiful buildings and to save the world from the CO<sub>2</sub> emissions caused by the production of new bricks.

The REBRICK process exploits the huge reuse potential of used bricks through automated sorting of demolition wastes; separation of old bricks; and cleaning using vibrational rasping, making each brick ready for reuse. In the production, the old bricks are cleaned, manually sorted and stabled by a robot. The bricks are sold both to renovation projects for existing buildings and to new construction where the builder wants to save the environment from CO<sub>2</sub>.

As the baking of new bricks is very energy and resource intensive, the ability to reuse bricks will have a major environmental impact through reduced CO<sub>2</sub> emissions and reduction of waste. Everytime the new brick is replaced with a reused brick, the saving for the environment is 0,5 kg CO<sub>2</sub>.

The initial focus of the design process was to determine the best way to reuse and clean the bricks. The aim was to achieve a final product with the desired properties without the use of chemicals or water. This was necessary in order to turn waste into a reusable product that could generate profit. These were the main technical challenges. The cleaning process leads directly from waste to product.

Demolition brick rubble is loaded into a hopper, which is then transported by conveyors to a separator that separates mortar and other materials such as wires, cement and wood from the bricks. The automated system additionally separates whole bricks from damaged bricks. The bricks are then cleaned in a patented vibration-based process. After cleaning, the bricks are manually sorted according to their visual characteristics, quality and value. Each brick is then placed on a conveyor s

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## Loop Mission

LOOP Mission is based in Montreal, Canada. LOOP Mission are the creators of cold-pressed juices and unique beers. They also supply high fibre pulp residue that eventually becomes doggy snacks.

The massive waste in the agricultural industry was an idea behind establishing the company. Thus was born the “Rescue Squad” looking to save those fruits and vegetables that food banks couldn’t handle and turn them into cold-pressed magic. The components for LOOP products are collected before companies like Mucci Farms in Ontario and Courchesne Larose in Montreal, Canada are forced to send perfectly tasty and healthy yet imperfect looking produce to landfills.

Endangered fruits and vegetables that are saved by LOOP’s rescue squad are carefully washed with alkaline water, then pressed. It extracts all the juice from our produce without using any heat, which allows to preserve the integrity of all those potent nutrients while keeping all precious liquids alive.

LOOP works on the concept of capturing blemished, stock imbalanced, or rejected vegetables and fruits to create a variety of juices that are put through a process called pascalization (sterilisation via pressure) rather than the common use of pasteurisation (sterilisation by heat). Because cooking alters foodstuffs, LOOP doesn't pasteurise their juices. Instead, they rely on high-pressure pascalization to extend the shelf life of the juices.

Pascalisation is a method of preserving and sterilising food, in which a product is processed under very high pressure, leading to the inactivation of certain microorganisms and enzymes in the food. During pascalization, more than 340 MPa (3.4 kbar) may be applied for approximately fifteen minutes, leading to the inactivation of yeast, mould, and bacteria. Essentially, it is akin to plunging the bottles 60 km deep into the ocean. Strong water pressure destroys harmful pathogenic bacteria without destroying nutrients or affecting taste. It also ensures that juices remain perfect

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## Vegea/VEGOOD

VEGOOD, based in Milan since 1998, is a provider of biomaterials for other brands in industries such as fashion, furniture, packaging, automotive, and transportation. VEGOOD prioritizes sustainability as a core principle of their social responsibility policies. They utilize vegetable, recycled, and bio-based materials in their production processes to create new materials for various industries by transforming agro-industry biomass and residues.

To decrease companies' emissions and waste, VEGOOD provides new sustainable raw materials to manufacturers, particularly by replacing fossil-based or animal-based materials with sustainable raw materials made from wine production waste.

VEGOOD has developed a process to repurpose grape leftovers from wine production. Their production process is environmentally friendly, free from toxic solvents, heavy metals, and harmful substances. The leftover grape skins and seeds are dried and undergo a particular process to create a blend. Then, the blend is spread out to form sheets. These sheets undergo various finishing treatments to give VEGOOD different properties, such as weight, thickness, and elasticity, depending on their intended final use. This process helps to decrease the demand for new resources.

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## Parley/CleanTheOceanAndMore

CleanTheOceanAndMore is an environmental activism organization dedicated to cleaning the oceans from plastic litter and promoting sustainability. They organize beach clean-ups, collaborate with famous brands, and use collected plastic to create new items such as surfboards and glasses.

They also raise awareness through events and talks. Their activities revolve around recycling, design, and promoting environmentally friendly practices to combat ocean plastic pollution.

The mission of CleanTheOceanAndMore is to clean the oceans of plastic litter and give it a new life. They aim to eliminate the use of virgin materials and promote the use of recycled materials as inputs in the economy to create a cleaner and more sustainable environment. They strive to raise awareness about the issue of ocean plastic pollution through their activities, events, and talks, ultimately working towards a future where the oceans are free from plastic waste and where recycling and sustainability are prioritized.

They follow a circular model of resource management focusing on reducing waste and maximizing the value of resources through the implementation of the following practices:

1. **Plastic Collection:** The organization conducts beach clean-ups to collect plastic litter from the ocean.
2. **Recycling:** The collected plastic is then cleaned, processed, and recycled to create plastic pallets.
3. **Resource Reuse:** The recycled plastic pallets are used to produce new items, such as surfboards and glasses, in collaboration with famous brands. By reusing plastic waste, they avoid the need for new resources and clean the ocean!

Results of their activity are distributed on the market to companies that can use the recycling materials in their business/production processes.

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## ECOGADGETS/Alisea

ECOGADGETS is a company that helps other businesses to be more sustainable by recycling different materials and designing eco-friendly products. They are based in Vicenza (Italy), but their impact extends worldwide.

They have established recycling processes that allow them to transform companies' waste, such as glass, metals, aluminum, organic waste, plastic, paper, leather, rubber, and fabric, into valuable resources.

Once the waste materials are collected and processed, ECOGADGETS utilizes its expertise in eco-design to repurpose these resources into innovative products. These newly created gadgets can serve multiple purposes. They can be sold as new items, allowing companies to generate revenue while offering sustainable alternatives to customers. Additionally, ECOGADGETS recognizes the importance of building stronger relationships with clients, and they often choose to gift these gadgets to their valued partners and customers, strengthening those bonds while promoting sustainability.

They understand that waste should not be seen as a burden but rather as an opportunity to recover valuable resources. Through innovative recycling processes and eco-design practices, they empower companies to reduce waste, save costs, and contribute to a more sustainable future.

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## PHOTOV/OffGridSun

PHOTOV is a Padova-based company specializing in solar solutions. They offer a wide range of customizable products and services focused on renewable energy, particularly solar panels, and photovoltaic panels. Photovoltaic panels and thermal solar panels can help us to reduce the pollution emitted by our national energy mix, and to be energy independent, decreasing the dependency on fossil fuels, such as petrol and natural gas.

The primary objective of PHOTOV is to drive the adoption of renewable energy technology in companies and production processes. They are committed to providing solar solutions that enable companies to reduce their carbon footprint and transition to green energy from renewable resources, such as sunlight, which is the most abundant circular input on Earth. PHOTOV aims to facilitate the widespread use of renewable energy technologies, even off-grid, by offering customizable solar panels, photovoltaic panels, and related products.

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## Diesel/CHEEZEL

Cheezel is a renowned brand based in Vicenza (Italy) with a global presence. Now, stars and influencers from all over the world are wearing their iconic pieces. By incorporating innovative technologies, the company strives to create garments that are not only stylish but also environmentally responsible.

They have implemented measures to ensure efficient use of resources and to reduce waste. This includes implementing recycling systems, utilising renewable energy sources. Cheezel has developed a new denim fabric for their jeans that incorporates innovative technologies aimed at saving water. This fabric utilises an antibacterial fiber, which helps to reduce the frequency of washing required for the jeans. The antibacterial properties of the fiber inhibit the growth of odor-causing bacteria, allowing the jeans to stay fresh and clean for longer periods between washes.

By reducing the need for frequent washing, Cheezel's jeans made from this fabric significantly save water. Traditional jeans often require regular washing to maintain cleanliness, which consumes a substantial amount of water throughout the garment's lifespan. However, with the antibacterial fiber incorporated into the fabric, Cheezel's jeans can be worn for extended periods without the need for washing, conserving significant amounts of water.

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## Naturasi/GREEN MARKET

GREEN MARKET is an Italian company that deals with the wholesale and retail distribution of organic, biodynamic, and natural products, through a circular model. This model starts from seed and reaches the table, fostering responsible relationships among different actors.

Their mission is to protect biodiversity and support food producers who are dedicated to using only natural methods in their production processes. Even though their products may have a higher price, it reflects a compromise between the exceptional product quality and fair compensation for producers.

The company has been committed for many years to restoring the natural order in the production of goods sold. In particular, for the production of agri-food goods, GREENMARKET promotes both new technologies that can reduce the amount of water used, such as varying irrigation according to the precise stages of plant development, and technologies that, although already used for decades, are not exploited by companies in the intensive production of plant products: rotations and manure of crops, choice of specific seeds for organic and biodynamic agriculture. Finally, their protocol provides that farmers, whose products are sold by the farm, must allocate 10% of the area to the development of native flora and fauna, preserving, where already present, or preparing hedges, groves, permanent or temporary grassland areas, hilly ponds, and/or wetlands.

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## Next Future Generation/SMARTGO

SMARTGO is a startup based in Padova and is recognized worldwide as a pioneer of innovation in the transport sector. The company is renowned for its production of alternative buses.

The main objective of the company is to find a way to reduce the impact of public mobility: in fact, they believe that, even though public means of transport such as buses are the best solution to an address air pollution in the transport sector - they still represent a waste of energy, when they are used by only few people.

SMARTGO has designed the bus of the future that is not only electric, but also modular. This advanced smart transportation system is divided into modules that can be customized according to the needs of passengers. Each module can be joined and detached from other modules on standard city roads. When joined, they create an open, bus-like area among the modules, allowing passengers to stand and walk from one module to another. The designers' idea behind this concept was that although a whole 12-meter bus is needed at rush hour, maybe it's not necessarily needed at midnight.

That procedure allows the company to operate in the CE model, when the space in the bus is shared with the passengers in the most possible effective way.

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## Patagonia

Patagonia, Inc. is an American retailer of outdoor recreation clothing. It was founded in 1973 by Yvon Chouinard. Patagonia has been donating 1% of its total sales to environmental organisations since 1985 through One Percent for the Planet, an organisation of which Yvon Chouinard was a founding member. Since 1986, Patagonia has made a commitment to sustainability for the first time. The clothing brand aims to reduce its environmental impact through a number of different initiatives.

In 2005, the company embarked on an idea that involved creating a line of clothing that would never go to landfill. Return, recycle and reuse every polyester fibre. Polyester, traditionally sourced from petroleum, seemed like a good place to start, so the first programme was launched with the Capilene clothing line. Used base layers were collected from customers and then recycled to make like-new polyester. The programme was called the Common Threads Recycling Program. Ironically, Patagonia, while creating good quality fabrics, ended up getting very little recycled Capilene material. The program was built on the basis of the special procedure that regulates the system of purchasing the old clothes.

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