Associació Àmbit B30

CIRCULAR ÀMBIT B30

Coordinated by

fundación forumambiental | inèdit | CIRCLE ECONOMY

Financed by

Diputació Barcelona

INTRODUCTION

Circular cities and regions

Currently, more than 5% of the world's population lives in urban environments, and this is expected to increase to 70% by 2050. Cities are responsible for more than two thirds of global energy consumption, more than 70% of greenhouse gas emissions and the generation of 1.3 billion tonnes of waste per year. These vast material footprints of position cities in an undeniable role in the pursuit towards a more sustainable future. With global urban populations set to grow by a further 2.5 billion people by 2050, demand and overall consumption of resources set to grow in parallel. This growing demand, combined with a finite supply of raw materials, will generate shortage problems that will have a profound impact on economic development. Current linear growth exceeds the planetary boundaries, while at the same time it limits the creation of a liveable and resilient future.

The circular economy is a solution that advocates for a fundamental change in our current economic system, one that decouples growth and prosperity from the use of natural resources. Within a circular economy resource cycles are closed on the smallest scale possible while maintaining value for as long as possible. The benefit of this system is that it not only reduces resource consumption, but it can also significantly contribute to a reduction in greenhouse gas emissions towards the 1.5 °C global warming limit, while at the same time provide new employment opportunities.

Municipalities as agents of change

Urban environments are the cornerstones of innovation, economic activity and population growth. As hotspots of people and businesses, urban regions have a huge influence on the development of our society, making them key drivers in the global transition to the circular economy. Cities have been increasingly recognised as agents of change, not only experiencing the negative effects of climate change and other environmental impacts, but also having the ability to react to them. Cities are the intersection of resources flows, businesses and consumption, presenting an ideal starting point for a circular economy.

Towards a circular Àmbit B30

The Àmbit B30 is a leading industrial and knowledge-based territory within the metropolitan region of Barcelona, Spain, which has to face new economic, environmental and social challenges. The circular economy presents a decisive opportunity for companies in the region to increase competitiveness and drive resilience, as well as support a better, healthier, and more sustainable quality of life for citizens.

To promote the transition to a circular economy in the Àmbit B30 area, a work group integrated by the association Àmbit B30, the Environmental Forum Foundation, Inèdit and Circle Economy, developed during 2018 an analysis of the potential of the circular economy in the region and has defined a future vision of a circular B30. Throughout the project, other agents of change of the territory have also collaborated, such as the Research Park of the UAB, Eurecat and Vallès Circular, and the results have been validated with the work group, and local interest groups.

The Circle City Scan

The Circle City Scan is a multi-phase and multi-stakeholder innovation process, designed to reveal where opportunities lie for the circular economy and support the development of practical and scalable pilot projects at the city level. The three phases of the Circle City Scan form a 'guided process' that identifies key opportunities to develop impactful circular economy strategies.

Phase 1: Identifying The starting point

Provides insight into what the strengths and weaknesses of the local economy are. It shows what skills and sectors are at the core of the economy, and how these skills can be used in a circular economy. In this phase three sectors are prioritised.

Phase 2: Material flow analysis and sectoral research

Provides insight into the magnitude and nature of the material flows through the city in order to to tackle those material flows that are highly impactful to the environment. This phase is complemented with research on each sector to frame and focus the main points of intervention, challenges and opportunities to deploy the circular economy. This phase defines four areas of work: the three sectors selected in Phase 1 and adds the field of packaging systems.

Phase 3: Circular strategies

Presents a vision of the future by defining circular strategies for the territory, for the four areas of work defined in phase 2. In this phase, 16 specific circular opportunities are presented for the Àmbit B30.

PHASE 1 IDENTIFYING THE STARTING POINT

Transitioning towards a circular regional economy is a complex journey that involves different stakeholders, companies, technologies and resources. With this wide variety of stakeholders, different elements must be activated to successfully start this transition. It is necessary to evaluate and identify the starting point, which implies understanding the economic, political and territorial context, to be able to adapt the plan to promote the circular economy to the reality of the region, but also to identify the levers and strengths that can strengthen this path. This information will help establishing a series of priority sectors or areas in which to continue deepening for the identification of circular opportunities.

The Àmbit B30

The B30 is the third ring road that by-passes Barcelona, and a section of 50 km of the highway AP-7 that connects all the Mediterranean coast of Spain with the rest of Europe. It involves 23 municipalities around the road, almost 500 km2 and more than one million inhabitants.
The economic, demographic and environmental relevance of this industrial pole of Catalonia and of the south of Europe has led to the 23 municipalities of the Àmbit B30, and other key organisations in the region, to create an association from which to work for a vision and common goals.
Founded in 2013, Àmbit B30 association has as its founding objectives the promotion of the economy in the territory, promoting innovation in all economic sectors and generating more and better employment opportunities. In this sense, one of the main pillars to achieve these foundational objectives is to become a reference territory in a circular economy where, for example, emphasize the opportunities of industrial symbiosis (due to the high number of polygons) and the transformation of waste into new raw materials (due to the strong presence of the specialised chemical industry).

Industry and research, the economic drivers of the region

The territory that now forms the Àmbit B30 evolved to a great extent during the 20th century, witnessing a high population growth and new business opportunities. Industrial activity was concentrated in the current area of the B30 highway, to the detriment of areas such as the Barcelona region. Economic development focused on manufacuring sector, especially in the textile and then the metallurgical industries, before transitioning towards a more balanced sectoral model with a stronger prominence of service-sector activities and high added-value.

The 21st century is marked by the economic crisis of 2008, which causes the metallurgy industry to lose weight in favour of chemistry, pharmaceuticals, rubber, and food.

The Àmbit B30 currently has a strategic location, since it is one of the most active European regions (Barcelona-Lyon area). It stands out for its important industrial muscle, concentration of high-tech industrial activities, and hosting of a large number of first level educational, research and technology centres. It is the first industrial conglomerate in Spain, accounting for 17% of Catalan GDP, and 23% of Catalan industrial GDP. It is the only region in Spain that is geographically connected to the rest of Europe. This good connection with other territories entails a great circular potential because of the volume of raw materials and waste that crosses the region.
The Àmbit B30 association aims to turn this territory into a leading economic hub in southern Europe and a frontrunner in the implementation of the circular economy

The main assets of Àmbit B30

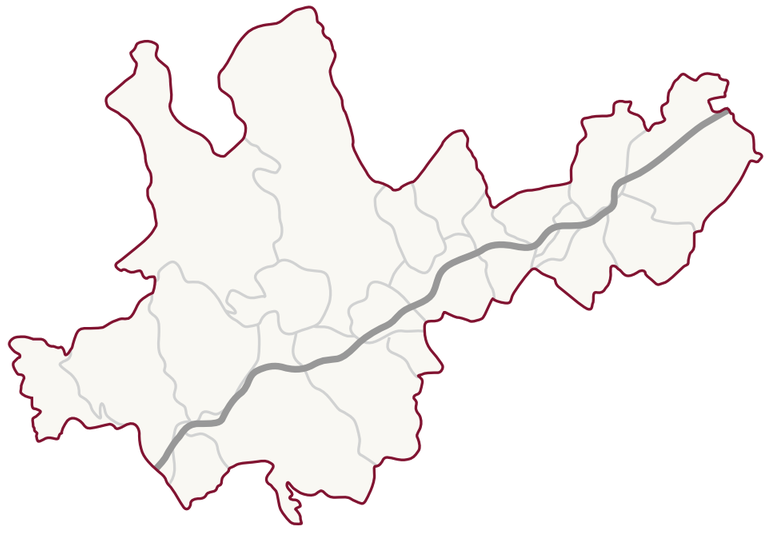
MOBILITY Mobility infrastructures such as main roads and rail networks. The B30 (in which the association gets its name), C58 and AP-7 highways stand out. The region also has the CIM Vallès (Intermodal Goods Centre).

KNOWLEDGE High-quality educational, research and technological centres (64 research centres, 10 science-technology parks, 15 university buildings and the Alba synchrotron).

INDUSTRY Broad and diverse business region, which reaches up to 30,000 companies. It concentrates 25% of total industrial employment of Catalonia, in more than 195 industrial parks and 7,000 hectares of industrial land.

Economic, employment and circularity potential level

In this first phase (see following page), the main economic sectors of the territory have been evaluated at an economic, employment and circularity potential level. The economic analysis focuses on Gross Value Added (GVA), which provides an insight into the economic value that each sector contributes to the local economy. Secondly, employment figures for each sector have also been estimated. Finally, the high-level environmental impact of each sector has also been analysed through a 'circularity potential' index. This index includes the evaluation of the following variables: resources use intensity and of waste generation, as well as the sensitivity of the sector (how it would be affected and how it affects) to the circular economy, motivation or receptivity, belonging to networks or clusters, and previous experience in circular economy projects.



PHASE 1 IDENTIFYING THE STARTING POINT

Based on the data collected, the 10 sectors with the highest results have been selected and ordered. The diagram at the following page shows for each one of them, the economic, number of jobs and circular potential scores. For each of these three indicators, the sector with the greatest GVA or the greatest number of jobs or the greatest circularity potential (respectively) receives a score of 10, and the smallest sector a score of 1. Based on its accumulated score, the sectors have been ordered.

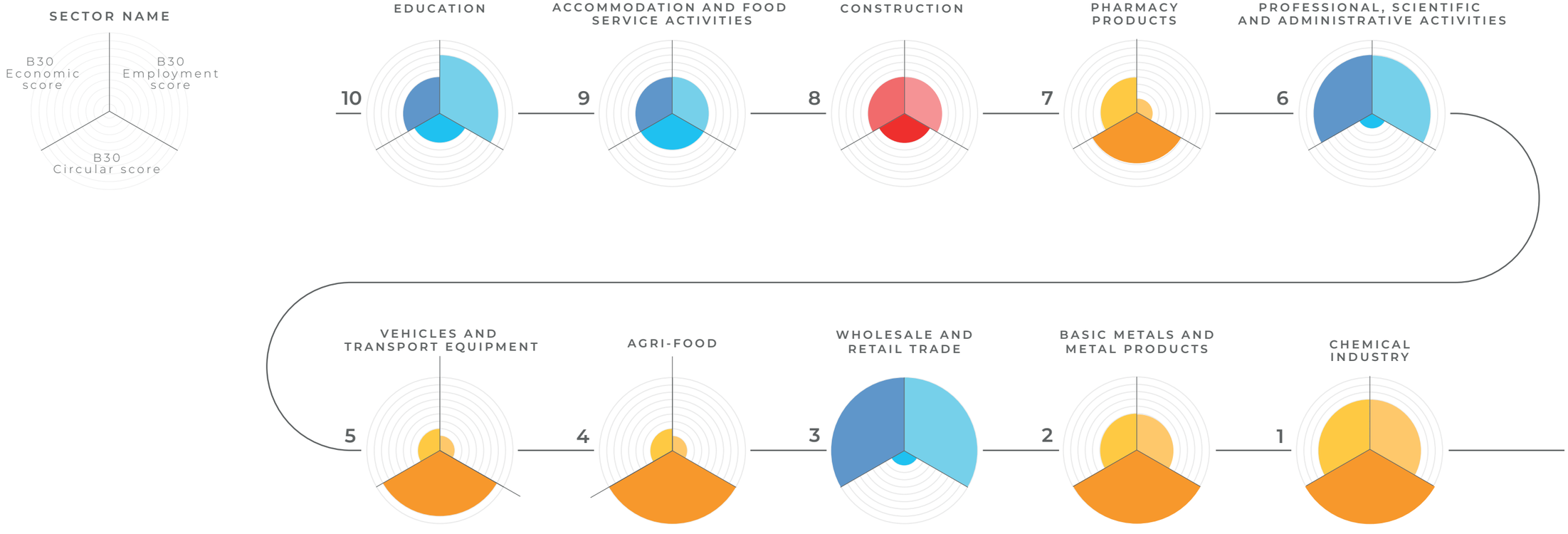
Employment
Following the current evolution of the economy, most jobs are concentrated in the services sector, most notably in wholesale and retail (94.000), professional activities that include research and scientific activities (50.000), education (35.000) and chemical industry (24.000).

Value added
However, this territory is also characterised by the high industrial concentration: 31% of the GVA generated in the B30 area is of industrial origin, compared to the Catalan average of 21%. The chemical industries, pharmacy, metallurgy and agrifood sector are key manufacturing sectors in the region.

Circular score
With respect to the relative use of resources (i.e. by unit of economic value generated), the sectors with the highest ratios are, in descending order, the chemical, automotive and agri-food industry. In the ratio of waste generation, metallurgy, the paper and graphic arts and agri-food industries stand out. The service sector presents a low intensity in the use of resources and the generation of waste. The sectors of chemicals, energy and waste management, and agri-food are the ones that have the greatest sensitivity and motivation to implement a circular economy.

The agri-food, metal and chemical sectors are the drivers of the circular economy in the Àmbit B30

Based on socioeconomic and circular potential analysis, while also taking into account other relevant criteria such as alignment with the political priorities, visibility and differentiation and territorial balance, a prioritization has been made for the following sectors: agri-food, chemical, and the metal value chain that includes metallurgy. Each sector is deeply rooted in the economy and are instrumental in developing a circular economy. Combined, these three sectors provide more than 58.000 (14%) jobs and add €5 billion (17%) to the local economy, while also ranking top in terms of circularity potential. In the next phase, the material flows and possible areas of impact are explored for each of the three sectors.



The three sectors prioritised during **phase 1** have been selected for their influence in the local economy and their potential transformative potential towards a circular economy. To effectively drive the implementation of practical and scalable strategies for a circular economy within the three key sectors, it is necessary to carry out further quantitatively and qualitatively analyses to pinpoint most promising opportunities and strategies. **Phase 2** focuses on understanding the sectors in greater detail, exploring the flow of materials, energy and waste, as well as relevant stakeholders, their relationships. This enables the identification of challenges, opportunities and circular inflexion points in each specific sector.

Mapping materials & waste flows

To undercover important environmental pressures associated with the consumption of materials within the sectors, a Material Flow Analysis (MFA) is a useful tool. An MFA shows how biomass, energy, metals, minerals and chemicals flows through B30, and how they are consumed and processed by the different sectors. These resource flows include raw materials and finished products. They represent the use of resources and the production of annual waste and are calculated from the most recent data available. In case of lack of data, the best available estimates are used.

In addition, it is also analysed how these flows are treated at the end of life. Waste treatment is detailed by sector and is expressed according to five end-of-life scenarios: by-products, material recovery, energy recovery, incineration, water treatment, and controlled landfilling. Waste treatment volumes are also given per year, according to the latest available data.

From here, the MFA highlights where the main losses of resources are located in the systems and where it is best to locate the points of intervention for a transition to a circular economy. The following three pages present the mapping carried out in the three sectors selected in phase 1.

Sectoral research

Supporting the quantitative insights of the Material Flow Analysis, a further qualitative analysis has also been conducted to understand the intrinsic characteristics of each of the sectors. The sectoral research focus on interviews with business associations, companies in the sector, technology centres, research parks and public administration.

At the same time, relevant information on business databases has been extracted to identify key stakeholders and bibliographic information has been sought to frame the challenges of each sector. The most relevant products or activities within each sector have been identified in the B30 region from the annual turnover of the companies of each type.

The results of this sectoral research complements the findings of the MFA, and can support the scoping of potential circular strategies to enable the realisation of tangible impacts. Throgh this research, the relationships that exist between stakeholders, their receptivity for the circular economy, the motivation for collaboration, and the main sub-sectors that have more opportunities to develop circular economy strategies are detected. Based on the identification of key points of intervention, combined with the exploratory study of the sectoral reality, the circular strategies presented in phase 3 are defined.

6 major challenges identified

With quantitative and qualitative information, synergies between different sectors are identified, focusing and framing the different challenges, both sector specific and cross sectoral. In total, six main challenges have been identified and have then served as a conceptual framework when designing the circular economy strategies in phase 3:

1. Traceability, recovery and refining of metals
2. Opportunities for improvement in the efficiency of processes in the chemical sector
3. Preserve the value of food resources to avoid waste, biorefineries and revalued food products
4. New solutions for packaging, bioplastics and new materials for the agri-food sector
5. Contribution of chemistry to the circularity of the economy
6. New business models, solutions and product as a service systems.

As a result of the analysis carried out in phase 2, it has been decided to treat packaging systems as another sector in which to articulate circular economy strategies. The relevance of packaging systems in the B30 region, the interaction with almost all sectors of the economy and the sense of urgency that exists globally to transform this field demand a systemic change in the way how consumer products are currently designed and packed.

MATERIAL FLOW ANALYSIS
Illustrative example

AGRI-FOOD

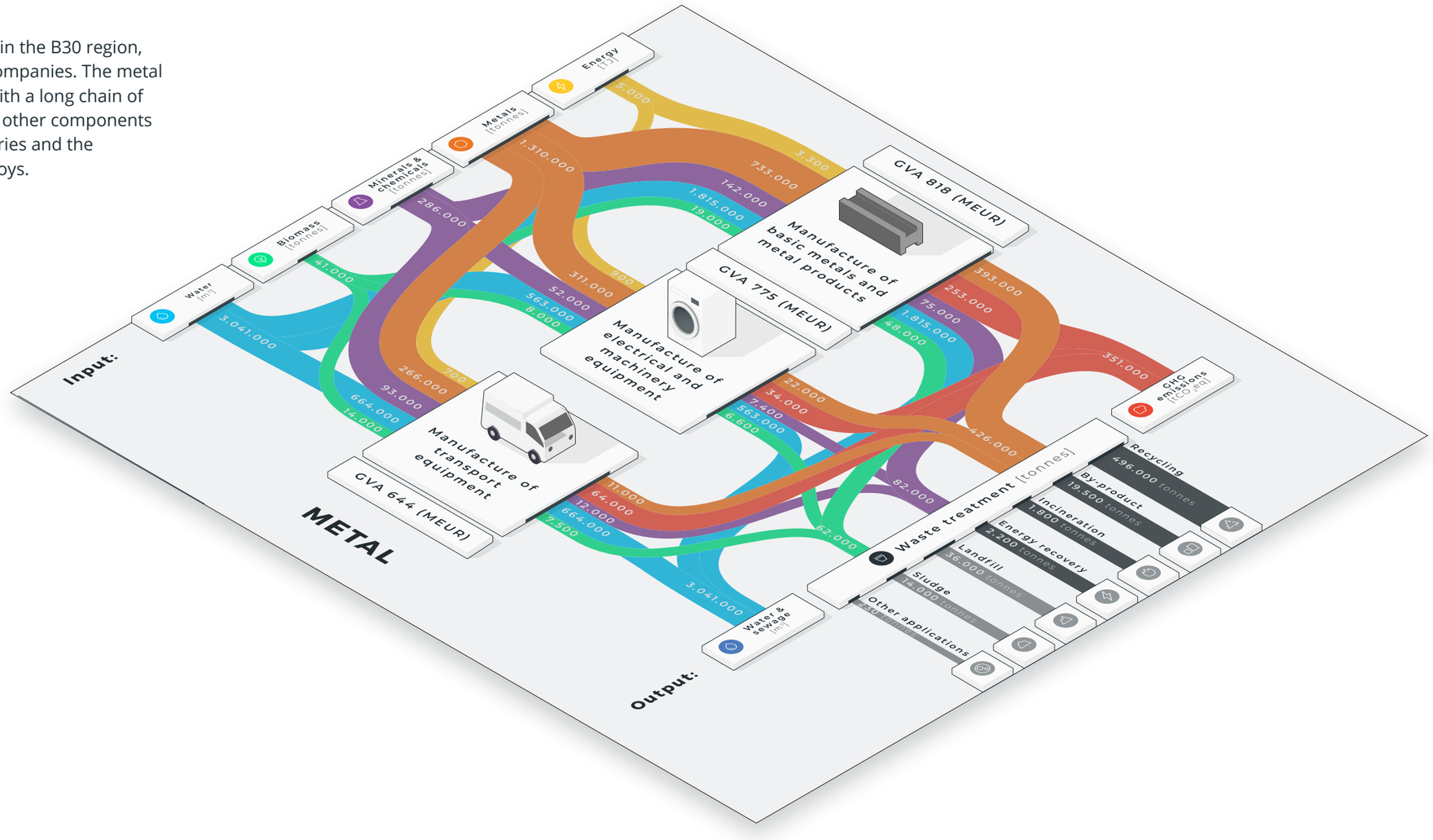
Within the agri-food sector, the subsectors of manufacturing of food and beverage products, and agricultural and animal production are included. Water and biomass constitute the greatest share of resource consumption, while the most significant residue is organic waste and water or sewage sludge. Compared to other sectors and sub-sectors, “crop and animal production” has a considerably high material flow (both inputs and outputs) in relation to its compared to its Gross Value Added. This serves to highlight the material intensive nature of the sub-sector.

The agri-food sector in the B30 region mainly consists of the production of oils and fats, bread and pastries, coffee and infusions, and meat products. Primary production is very unimportant at an economic level, although important from a land and landscape point of view. Overall, 84% of wastes are recycled.

METAL SECTOR

Within the metal sector, three sub-sectors are included: manufacture of basic metals and metal products; manufacture of electrical equipment and machinery; and the manufacture of transport equipment. These sub-sectors have a high consumption of metals, energy and water. There is also a high consumption of minerals and chemicals in the manufacture of basic metals and metal products and in the manufacture of transport equipment. Currently, 87% of the waste in the sector is recycled.

The automotive industry has a very high relevance in the B30 region, although activities are concentrated in just a few companies. The metal sector works largely for the automotive industry, with a long chain of suppliers involved in the manufacture of parts and other components for vehicles. Other relevant sectors are steel foundries and the manufacture of basic iron, steel and other ferro-alloys.



CHEMICAL SECTOR

Within the chemical sector, the two subsectors of chemical and chemical manufacturing, and the manufacture of rubber and plastics are included. The chemical sector in the B30 region consumes large quantities of minerals and chemicals, and energy. The manufacture of chemical products and chemicals consumes large volumes of water, while the consumption of biomass and metals is associated with the manufacture of rubber and plastics. 50% of the waste is recycled, although 30% is landfilled.

Within the Manufacture of chemicals and chemical products, the specialised chemicals have a higher potential to benefit from a circular economy model than the basic chemistry sub-sector. They are of great relevance at the B30 region, particularly detergents, lubricants, chemicals for the coating (dyes, varnishes, paints), and cosmetics.

PHASE 3 CIRCULAR STRATEGIES

Phase 3 proposes circular strategies that offer greater opportunities for companies in the B30 field in the sectors of agri-food, packaging systems, metals and chemicals. This phase presents the main innovations that can generate a lasting effect on the key material flows and already prioritises those strategies with more potential, feasibility and scalability. This analysis of sectorial innovations is shared and contrasted with the stakeholders of the region, with the ambition to validate the circular strategies proposed in each one of the sectors and identify new challenges or needs. The result of phase 3 is a list of 16 practical and scalable circular strategies that have the potential to drive systemic change. The 16 circular strategies are presented on the following page together with a short description of each.

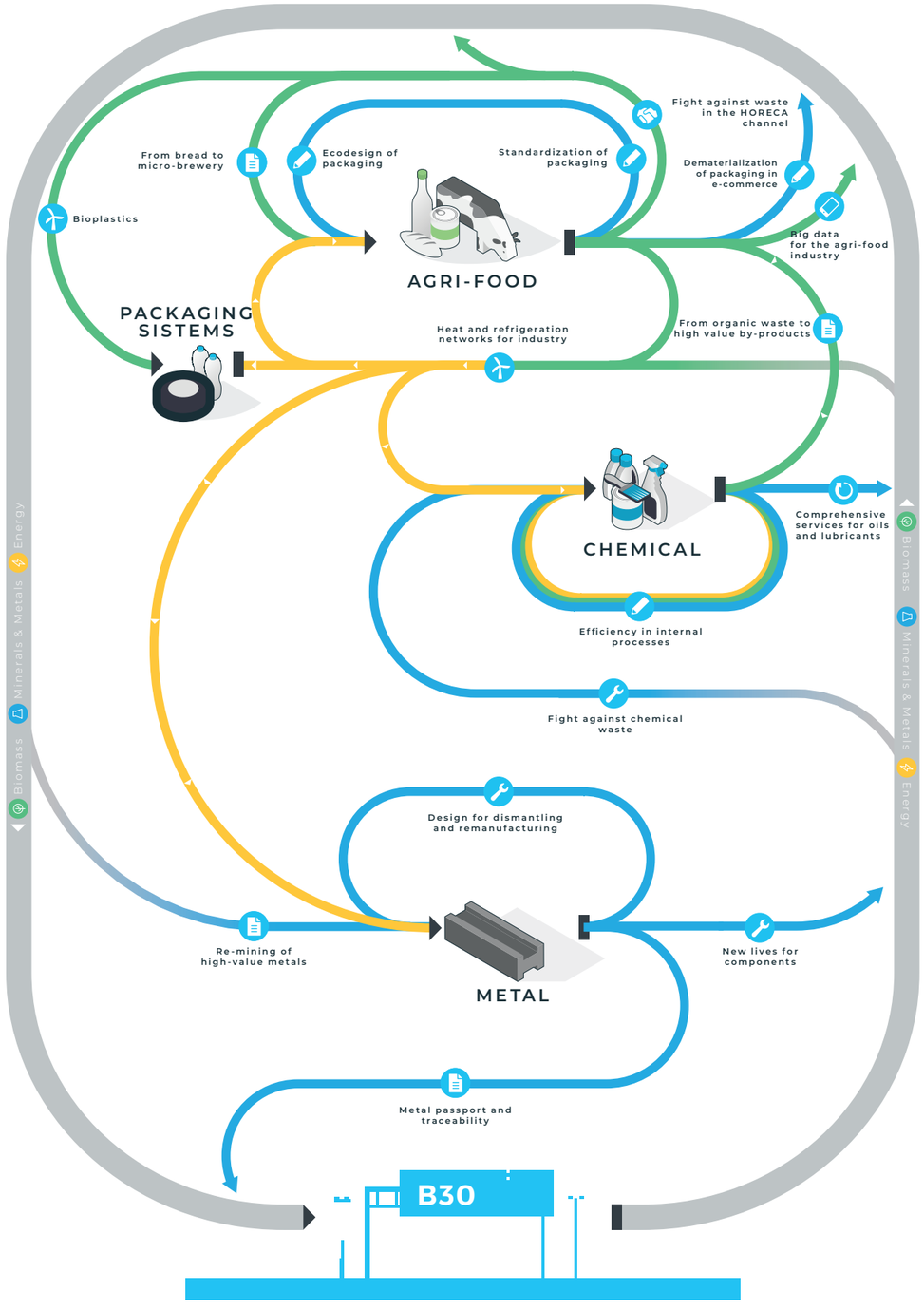
Building a vision of the circular future

First, a list of circular innovations that deal with the most urgent environmental challenges detected by the fields or sectors of agri-food, packaging systems, metal and chemicals was created. To do this, innovations that would make the four priority sectors more circular were identified. Based on the 7 key elements for a circular economy framework presented in this page.

Secondly, the strategies were filtered with the idea of identifying those with the highest potential, feasibility and scalability that could promote the transition to a circular economy in the B30 region. These could be an example of how various companies and public actors can work together towards a common objective. Special attention was paid to intersectoral benefits, collaborative work and the potential for impact.

Finally, a multisectoral workshop was organised with stakeholders of the territory that allowed to share and validate the circular strategies proposed in each one of the sectors, identify new needs or challenges, and connect with the stakeholders that could lead the circular transformation. At the same time, it served to make diffusion of the project and the work plan regarding the circular strategy for the Àmbit B30.

Based on the framework for identifying strategies in a circular region (see next page), four strategies have been developed for each of the four sectors. These 16 strategies change the way resources flow through the region. In addition, they show the interconnections between the sectors, and how the circular strategies can be fed back.



Framework for identifying strategies in a circular region

In order to identify the opportunities with the most potential for success in the region, the impact areas identified in the previous phase, were considered first. These insights provide a good starting point since it is possible to evaluate where are the most urgent environmental problems and where are the main levers for systemic change. Best practices and trends at an international level offer a guide on which are the strategies that can trigger a structural change of the system and how they can positively contribute to a circular economy in the future. Additionally, local information was used based on the specific industrial activity of each sector, the concrete challenges extracted from the interviews, and what experiences or circular pilots already existed in the territory. From this point, it is possible to identify which are the particular areas or strategies that each sector can lead and capitalise on them.

7 key elements for a circular economy

Circular economy is a complex issue that incorporates many types of organisations, sectors, and resource flows. To provide structure and orientation, Circle Economy defined 7 key elements needed to achieve a circular economy, based on the mapping of the different terms and definitions used by more than 20 organisations that work in the circular economy and were synthesised in 7 key elements.

The 7 key elements allow us to structure the type of circular strategies that can be implemented and refer to different points of intervention in the system. All elements are necessary in a circular economy, but some are more applicable to certain industries or stages in the value chain than others. By applying this classification, we create a useful framework to identify opportunities in each sector.

Prioritise regenerative resources

Ensure renewable, reusable, non-toxic resources are utilised as materials and energy in an efficient way.

Preserve and extend what's already made

While resources are in-use, maintain, repair and upgrade them to maximise their lifetime and give them a second life through take back strategies when applicable.

Rethink the business model

Consider opportunities to create greater value and align incentives through business models that build on the interaction between products and services.

Use waste as a resource

Utilise waste streams as a source of secondary resources and recover waste for reuse and recycling.

Design for the future

Account for the systems perspective during the design process, to use the right materials, to design for appropriate lifetime and to design for extended future use.

Incorporate digital technology

Track and optimise resource use and strengthen connections between supply chain actors through digital, online platforms and technologies that provide insights.

Collaborate to create joint value

Work together throughout the supply chain, internally within organisations and with the public sector to increase transparency and create joint value.

Fight against waste in the HORECA channel

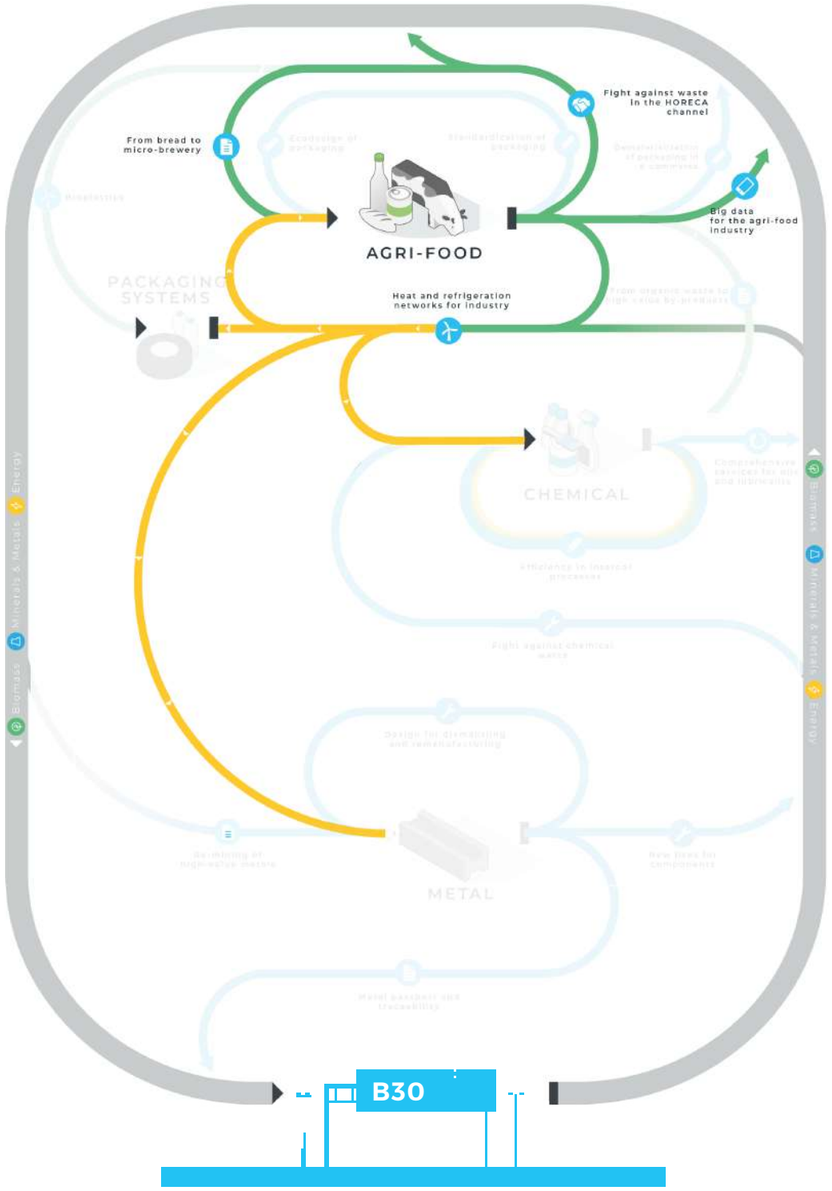
The HORECA sector (hotels, restaurants and cafes) generates a large amount of organic waste, some of which are still edible foods, although for various reasons they may not be marketable. The 23 B30 municipalities encompass more than one million inhabitants and a large number of HORECA establishments. In a concentrated geographic area, there is an opportunity to create strategic alliances between organisations to capture the value of residual organic products derived from HORECA, instead of being used for less efficient alternatives such as composting or energy recovery. Some examples would be platforms that connect HORECA channels with citizens to take advantage of leftover foods or cooked dishes, or alternatively use them for animal feed (direct or as raw material for the production of feed).

Case study
WeSAVEEAT

From bread to micro-brewery

The manufacture of bread, pastries and fresh baked products represents a turnover of about 600 million euros, making it the second largest agri-food sub-sector in the B30 region in terms of economic value added. The potential symbiosis of the bread industry with the brewing industry is very high, since the residue of a one can be a direct raw material of the other. The waste derived from bread and pastries, as well as cereal remnants, can be a key resource for the expanding model of local micro-breweries that produce under circular economy standards and offer local products. The strategy should approach the industries generate large quantities of waste, to partner with local breweries initiatives.

Case study
Toast Ale, UK.



Heat and refrigeration networks for industry

In industrial estates where the concentration of economic activity is high, heat and cold networks are an ideal strategy to take advantage of energy-saving waste to air conditioning buildings or industrial processes. In the case of B30, which brings together 195 industrial estates, these networks make a lot of sense. Centralisation in the production of heat / cold is an efficient strategy that allows the transmission and distribution of the capillary of energy supplied by the network to each building or production plant of the polygon. The agri-food industry has a high demand for heat / cold due to the characteristics of its industrial processes (boiling, cold cameras, etc.) and at the same time generates large amounts of energy-efficient waste. For this reason, the agri-food sector could ally with the industrial estates in which it is installed to meet its thermal needs and that of other companies, with networks fed by own agri-food waste or proximity.

Case study
Sweden has extensive and efficient waste management systems that have as a last resort energy recovery

Big data for the agri-food industry

The prospective potential of Big Data and Deep Data to improve the management of the useful life of the products and reduce food waste is very high. Increasing value information can be a key tool for detecting inefficiencies in the supply chain (e.g. temperature changes in cold chains) and can help tracking and managing food during production, distribution, and storage. In addition, this type of technology provides transparency and traceability in value chains, where apart from the greater efficiencies and cost savings due to the reduction of product losses, there is also a social and environmental contribution thanks to the reduction of the waste and the guarantee of information of the route of each product. Due to the important presence of agri-food industry, the need to draw efficient chains of value and the technological pole existing in the B30 field, opportunities are opened to lead the innovation of the industry and contribute directly to the circularity of the sector.

Case study
Provenance has developed blockchain technology to draw food chains and guarantee good practices and quality standards.

Bioplastics

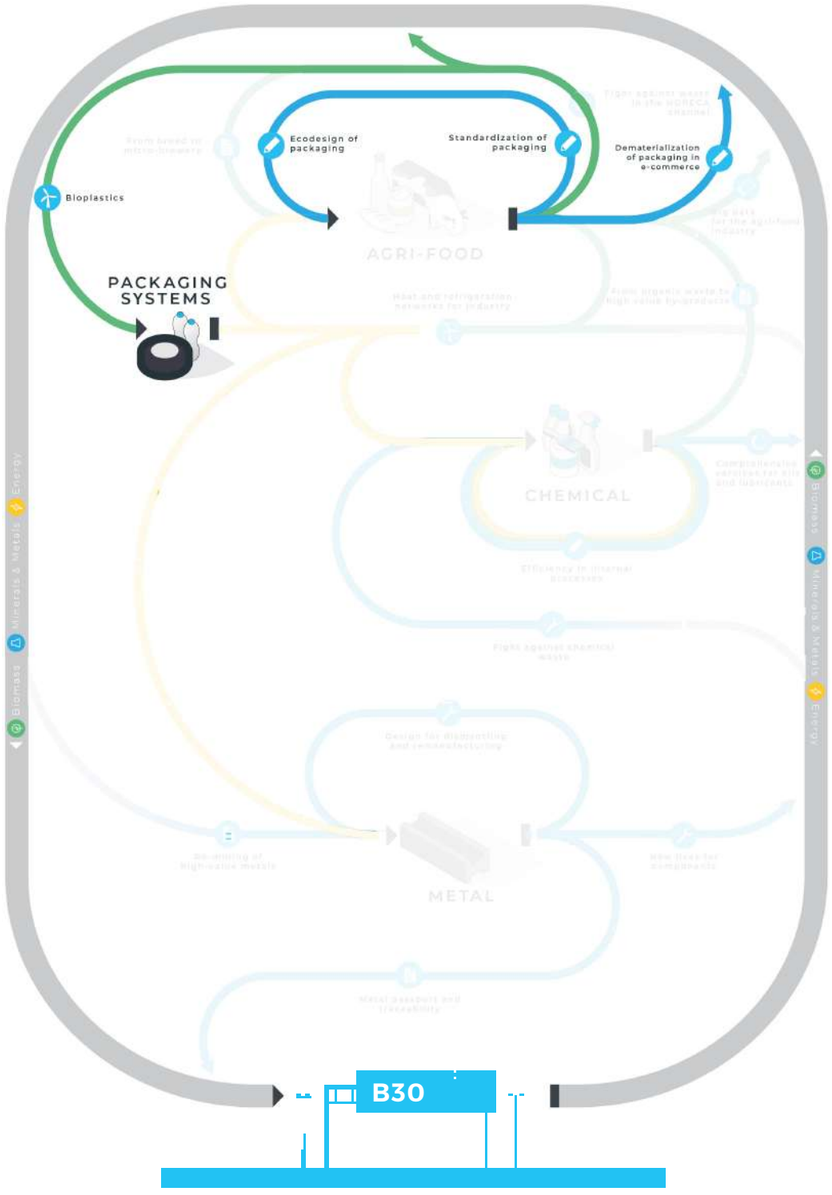
The economy of plastics requires a systemic change, although there are already strategies in materials and products that favour the circularity. One way to carry out this change is the use of bioplastics for the agri-food industry, the main consumer of disposable containers. This kind of plastics can be made from organic waste from agriculture or from the same agri-food industry, even from by-products of the same product they pack. This reduces the consumption of non-renewable fossil fuels, and depending on the composition, the new container can be compostable. There are many raw materials to make bioplastics: the first-generation ones with a high carbohydrate content (such as oils and vegetable fats or sugars); the second generation would be non-food crops (such as cellulose) and organic waste from the agri-food or energy industry; And there is a third generation from non-traditional organisms such as algae or fungi. For its large-scale production, it is necessary to guarantee the supply of sufficient quantities of raw materials at a competitive and stable price, and avoid competition with the production of food or feed.

Case Study
Ecovative is a company that creates biomaterials for the packaging sector, housing insulation and other products from local agriculture waste and fungi with the main objective of creating environmentally responsible alternatives to plastic packaging.

Ecodesign of packaging

Ecodesign presents a unique potential for B30's transition towards the circular economy. Designing packaging systems incorporating environmental criteria can have major repercussions throughout the value chain. Some examples of ecodesign strategies are monomateriality, optimisation of packaging to reduce logistics routes and design for reuse. At the same time, the development of new technological solutions allows to have containers that better preserve the products, inform of the state in real time of the foods (thus extending the useful life and gaining independence towards the dates of caducity). There are a number of challenges to large scale adoption of new ecodesigns, notably in collaboration between interest groups. The industrial and knowledge concentration in the B30 field can facilitate the collaboration between agents to lead the new economy of packaging systems.

Case study
Serhs



Standardization of packaging

One of the main barriers in the transition to a sustainable packaging model is the wide variety of packaging (in terms of materials and formats). This diversity of options, which until now has been understood as a differentiation and positioning of brand, greatly impedes packaging reuse systems and recyclability to achieve packaging solutions more circular and efficient. The criteria for the standardisation of containers must have a lifecycle vision, participating in the decision making to all the representatives of the value chain (designers, manufacturers, distributors, consumers, waste managers, etc.). This scenario can open a new universe of opportunities in the processes of circularity of the packaging systems, incorporating new and better solutions such as recovery, centralised cleaning and reuse of packaging by specific sectors (eg aluminium cans, bottles, spirits, etc.).

Success case
The REWINE project is an initiative to promote the reuse of bottles in the wine sector in southern Europe.

Dematerialisation of packaging in e-commerce

The boom in e-commerce is posing challenges for logistics operators and order management systems, which face accelerated demand growth. However, this new habit of consumption can also represent an opportunity for packaging systems and the circular economy. When surveying the potential of new packaging systems, we must take into account; (1) the dematerialisation of the container – enabled by new solutions to guarantee the protection of the product and at the same time reduce packaging (what is delivered to the final consumer is a just the product with less packaging) and enhance the user's experience; (2) Traceability - collaboration between agents of the value chain, creation of more agile return systems and have identified packaging solutions for multiple lives (eg robust, reusable and returnable boxes, where the distribution of last mile articulates a system of reverse logistics for the reuse of secondary packaging).

Success case
REPACK, Finland.

Metal Passport and traceability

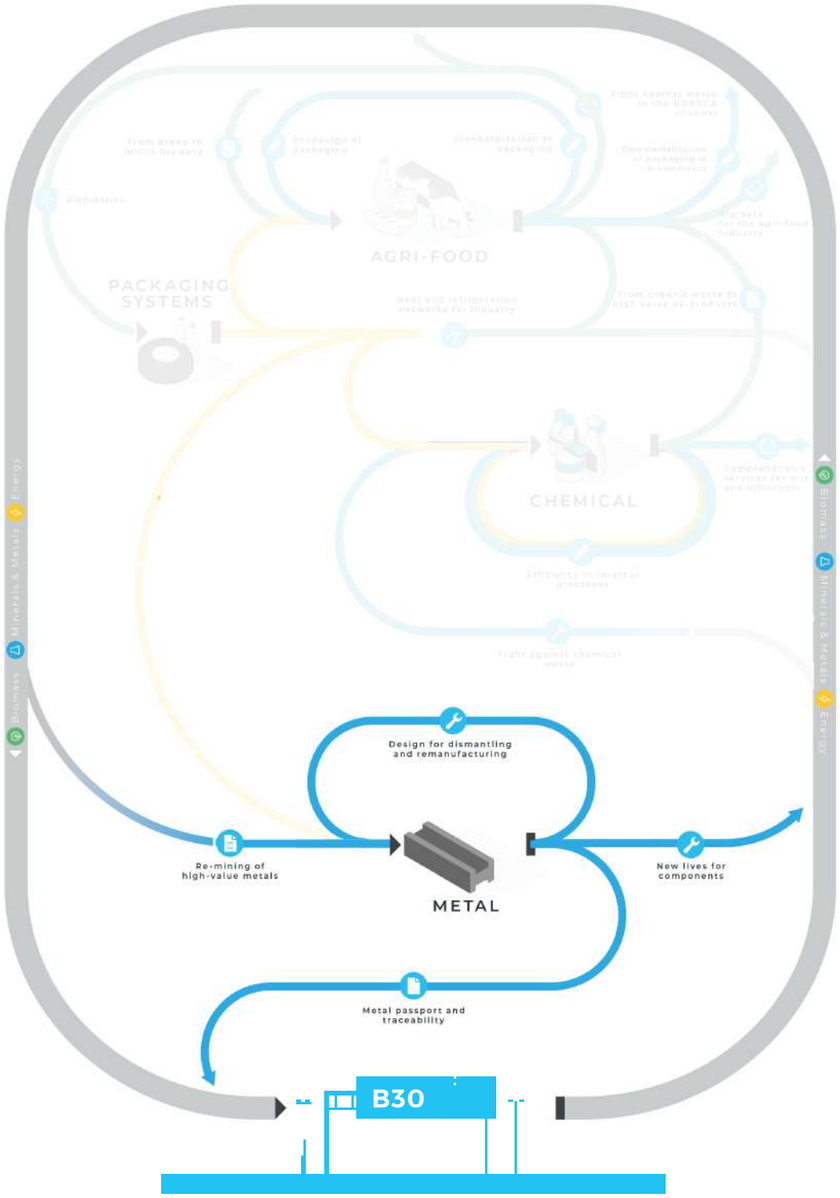
One of the main problems of the metal industry is the scarce traceability of metals once they are put on the market. Once a machine is manufactured for any type of manufacturing industry, or even metal parts to make products, the manufacturer usually loses traceability of that resource and does not finish recirculating in the most efficient way possible. The high potential for reuse and recycling of metal raises the challenge of tracing, as passports of resources (document that consists of all the materials that are included in a product or construction, which describe the characteristics of the materials used). The desired scenario represents a metal traceability system based on new technologies such as the Internet of Things that allow you to know when and how that piece or machine is being used, if it is advisable to repair or replace a piece to extend its useful life, to anticipate risks and capture the maximum value of assets with the ambition to reuse or recycle them.

Case study
Maersk, designs vessels with C2C passports to facilitate the separation of its components.

Design for dismantling and remanufacturing

Manufacturers of machinery, vehicles or other metal parts usually design their products thinking about efficiency, durability or productivity. However, in a context of scarcity of resources and extended producer responsibility, and in the face of new relationships with clients, it is key to design the products for future dismantling and remanufacturing. We can even go a step further and, instead of manufacturing products subject to the useful life of a component, a new business model can focus on facilitating remanufacturing of pieces and achieve customer loyalty through a more integral service, which includes product status diagnosis, maintenance, repair and disassembly. In this context, the producer designs and manufactures long-lasting modular products that are easy to disassemble and repair.

Case study
Canon designs its products to facilitate its remanufacturing.



New lifes for components

The scrapping of vehicles to take advantage of components is an activity that has existed for decades. However, there are more efficient strategies that could capture more value within the car production chain. Vehicle or vehicle manufacturing companies have the opportunity to recover off-the-shelf parts to re-introduce them to their value chain, with quality and performance equal to or greater than one factory output. In this case, it is important that these components are chosen strategically under economic, technical and environmental criteria, determining which have the greatest potential for reuse. At the same time, these pieces can be re-designed as a resource in the field of mobility, such as new electric vehicles with starter motors or motion sensors for urban traffic lights. In the same way, different parts of a vehicle (eg electric batteries) could have value and use in other sectors..

Case study
Autocraft Drivetrain provides remanufacturing services in a wide range of engines and components for the automotive industry.

Re-mining of high-value metals

Some of the most important metals in the electronics and renewable energy industries, are in fact very scarce resources. Gold – an irreplaceable metal used in the production of mobile phones - is estimated to only hold reserves for a further 30 years of mining. In this scenario, some companies have already begun to recover scarce metals in urban or industrial environments as a competitive cost strategy. The “golden nuggets” are those metals that, due to their high value, are more economically interesting to develop strategies for their recovery than to devote efforts to new deposits, which usually have very negative environmental and social impacts. In many cases, the recovery of high-value metals will require an inter-sectoral to collaboration, for example, between chemistry and metal sectors - both of which have a strong presence in the B30 region.

Case study
Accord has begun to recover platinum of high quality from obsolete medications.

Fight against chemical waste

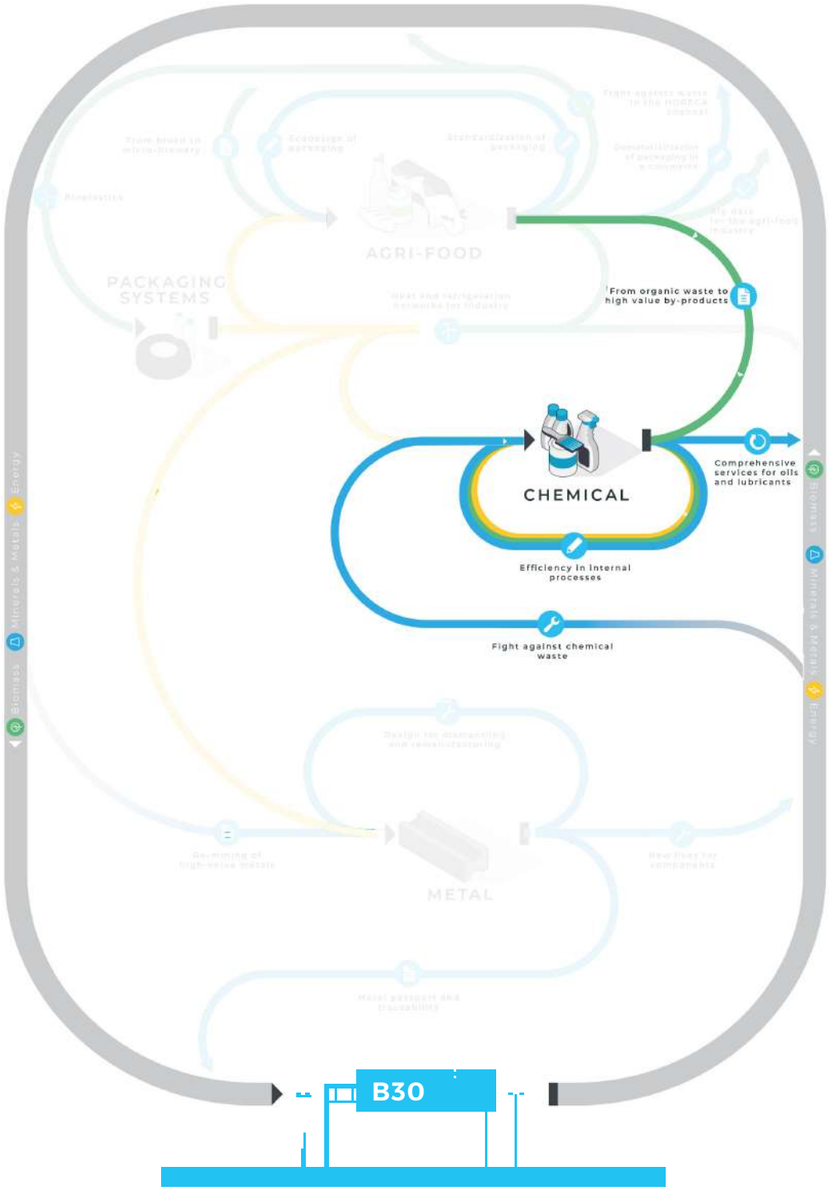
In the chemical sector, there is a significant waste of chemical products, both domestically and industrially. A clear example is paint, which presents both a challenge and an opportunity to recover and recirculate it. Many households store varnishes, dyes, paints and other dyes that often end up being discarded and destined for controlled deposits which can cause environmental damages. This challenge is relevant to the B30 region where a powerful chemical coatings industry is concentrated. Of the 2 billion euros created by specialised chemical companies in the B30 region, approximately 500 million represent the manufacture of varnishes, paintings, pigments and other coatings. Companies of this specialty have the opportunity to recover, reuse or recycle to take advantage of a source of resources that is currently very abundant in urban environments.

Case study
Newlife Paints, UK, is dedicated to reprocessing professional paint waste to make new quality emulsion paint.

Comprehensive services for oils and lubricants

B30 is a leader in the production of oils, lubricants and other coatings for both the industry and the end consumer. Understanding how products are used and increasing their value through the provision of additional services is a very interesting business niche. This type of strategy mainly calls on special chemical producers, because the profit margins are relatively high as well as the need for expert knowledge to optimise use. In such a model, chemicals required for a particular use are not sold directly to the customer, but are leased. The service provider offers a more comprehensive service, including maintenance, and can benefit from increased consumer. The environmental result translates into a decrease in the overall chemicals used and waste generated. The sectors of the economy that are currently using more this type of services are the automobile sector, food processing, and electricity and electronics.

Case study
SAFECHEM Europe (The Dow Chemical Company).



From organic waste to high value by-products

The circularity potential of organic substances can go far beyond energy recovery or compost when they are adequately separated. The chemical sector has the ability to develop more efficient solutions to collect and process such wastes with greater value and at higher levels of the waste hierarchy. Within specialised chemistry, new product products can be developed from agri-food, forestry or cellulose waste, pivoting its business model on the marketing of by-products derived from organic matter. From bio- and thermo-chemical processes, biomass can be transformed into bio-energy (biogas and biofuels), bioplastics, biolubricants, and other biochemicals. In the context of B30, with a high concentration of agri-food and specialised chemical companies, there are opportunities to transform residual materials into bioethanol and as well as such as cosmetics and detergents.

Case study
Ecover, BE, manufactures ecological cleaners and detergents from renewable raw materials and minerals.

Efficiency in internal processes

The chemical sector is a very resource-intensive industrial sector, with high spending related to raw material and energy use. This characteristic opens the door to rethinking the processes to be more efficient and effective. The strategies to achieve this desired scenario are diverse: to integrate the best available technologies in current plants (retro-fitting); advanced manufacturing (process modeling, simulations and process control through ICT); Stepping up processes and advanced preventive and predictive maintenance and control solutions. Strategies to gain efficiency in productive plants can translate into an increase in production capacity, reduction in emissions and significant energy savings, reduce product leakage, automate processes to obtain performance information and provide repairs and maintenance to extend its useful life of the machinery and other infrastructures of the company.

Case study
AkzoNobel identified a chlor-alkali plant in Germany that needed more steam than other similar facilities of the Dutch multinational. Combined multi-departmental efforts gave impressive results: steam consumption dropped by 27%. In addition, the energy supply could be changed to a more sustainable mix: today, 80% of the steam comes from a waste incineration unit.

Associació Àmbit B30

Lead by
Àmbit B30

Coordination
Fundació Fòrum Ambiental

Technical work and formatting
inèdit and Circle Economy

Publication date
2020

Financed by
Diputació Barcelona

Coordinated by

fundación forumambiental

CIRCLE ECONOMY

inèdit

Financed by

Diputació Barcelona