REPÚBLICA PORTUGUESA

AMBIENTE

Leading the transition

[Action plan for circular economy in Portugal: 2017-2020]

Technical Note

The present action plan (LEADING THE TRANSITION) is a contribution generated by the interministerial group designated for this purpose. The contents presented constitute a proposal for action, that were subject to public consultation, and were discussed and approved by the Council of Ministers in November 2017 and published in December 2017 (Council of Ministers Resolution n.º 190-A/2017).

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Content

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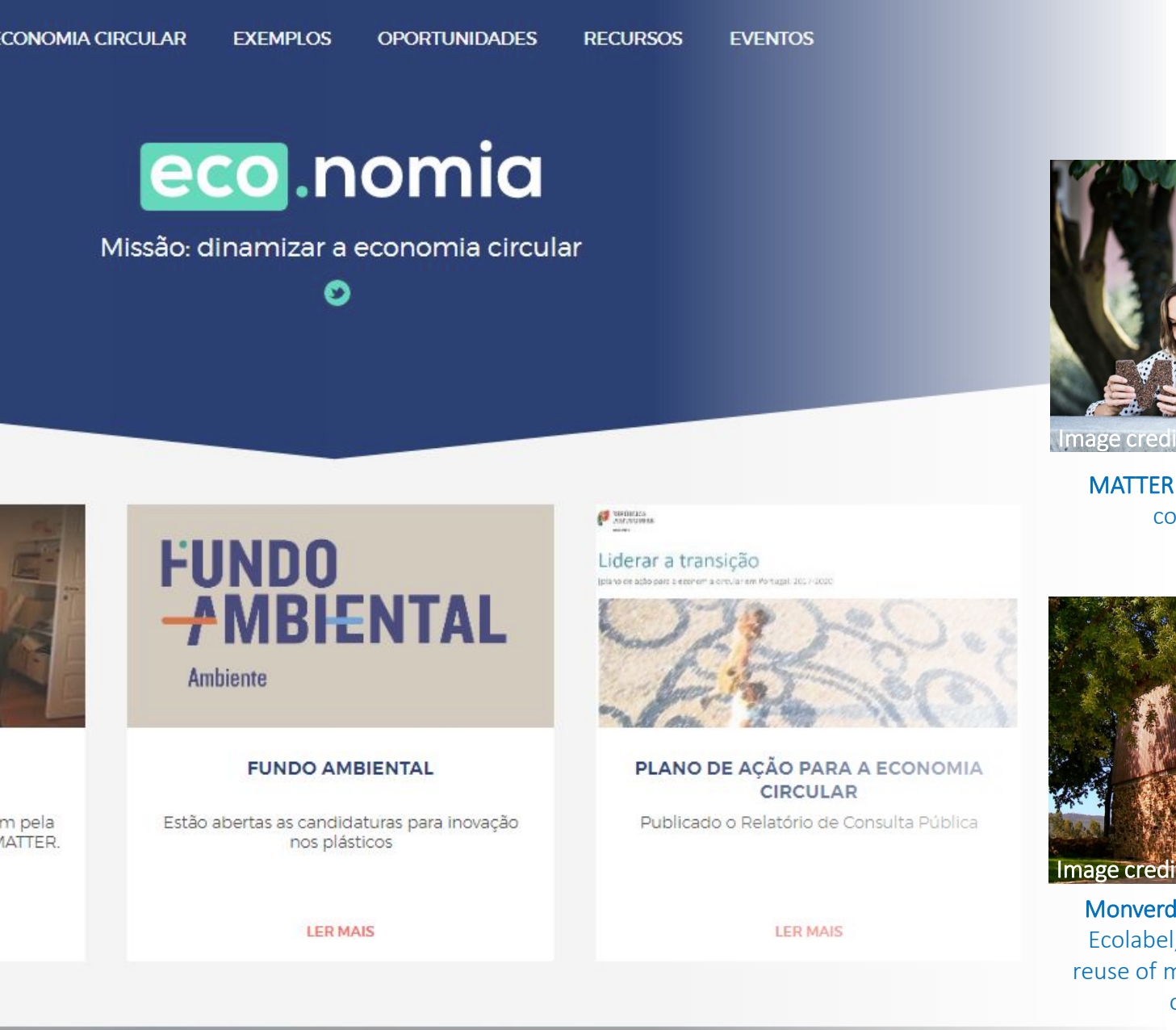

Image credits: Publico

MATTER: using food waste to make construction materials


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Forallphones: repairing, reconditioning and reselling smartphones

Image credits: Monverde

Monverde: hotel certified with the EU Ecolabel, promotes energy efficiency, reuse of materials and components, use of local raw materials

Image credits: Jinja

Jinja: production of bowls and plates, made by hand, using non toxic materials and textile waste

Foreword

From the environmental point of view, we are living on credit.

On August 8, 2016, it was "Global Overshoot Day", the day from which we began to consume the resources of 2017. The last time society consumed within the limits of the capacity for regeneration of ecosystems was in the beginning of the ‘1970s; since then, this milestone comes earlier in the calendar. Hence, we are living on credit.

The global natural economy - the biosphere - provides the goods and services upon which all life depends. Anthropogenic systems are its subsidiaries, extracting the resources that feed the economic activity and using its services - free of charge - of deposition, decomposition and regeneration.

Our linear extract-transform-use-reject economy has led us to this point: 65 billion tons of resources are extracted globally each year, of which only 7% is recycled.

What will the world be like in 2050, with 9.7 billion people and an economy that requires 186 billion tons of resources? With eroding material reserves critical to various industries such as Industry 4.0, renewable energy technologies?

The European Commission has recognized this fragility: since Europe is highly dependent on imports of resources, the risk of being held hostage by unstable supplies and price volatility is too great. And the environmental invoice also becomes too high.

What if we were able to preserve the resources that are already in use in the economy, keeping them at their highest economic value, for longer? It would not be necessary to extract and acquire so many raw materials, and we could reduce waste and other environmental impacts such as green house gas (GHG) emissions. We would have the capital to innovate, in business models, products and services, and we would create more jobs.

This is the rational of circular economy: a model of abundance, which contrasts with the scarcity of linear economics. A model that, if implemented, can bring gains to the EU of € 1.8 billion, from 1 to 3 million jobs, and decrease 2 to 4% of total annual GHG emissions.

We need to be more efficient and productive: not only to do "more with less" but to prolong its value. The "less" can be shared, be designed to "go home" and be repaired and reused, remanufactured and ultimately recycled.

Portugal already has a long history of policies to promote the efficient use of resources: in the management and valorization of specific waste streams, energy efficiency and green growth. This action plan is therefore not a beginning or an end: it is a means, in constant evolution, and requires the continuous contribution of all - ministries, public institutions, companies, community.

Because the Circular Economy can not be a matter solely of the Ministry of the Environment. In order to make progress, its principles have to be taken up transversally by the government, so that the opportunities and benefits multiply.

With this model guiding the European growth and investment strategy, it is imperative that together we take firm steps in leading this transition.

Because whoever starts today will surely lead tomorrow.

João Pedro Matos Fernandes - Minister of the Environment

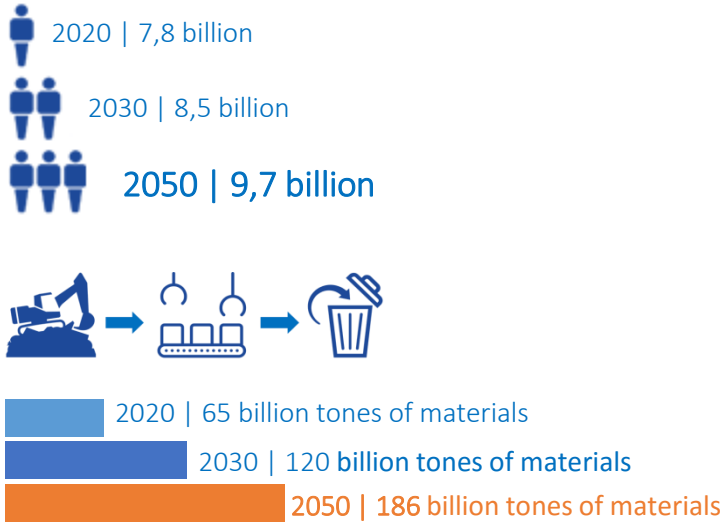
Introduction

"Under existing trends, natural resource extraction will increase from 85 to 186 billion tones to 2050, reflecting a 71 percent increase in per capita resource use."

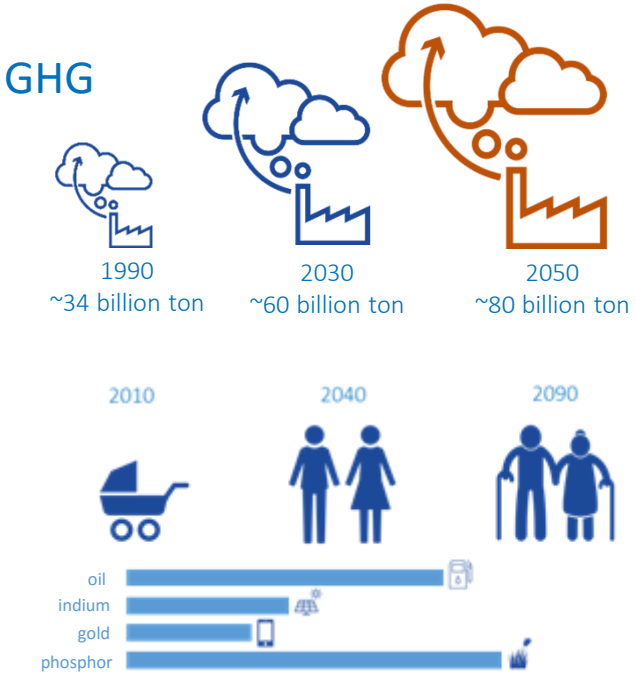
[*Resource Efficiency – Potential and Economic Implications.* UN Environment | International Resource Panel. 2017]

Why

[linear economy = risk and scarcity]

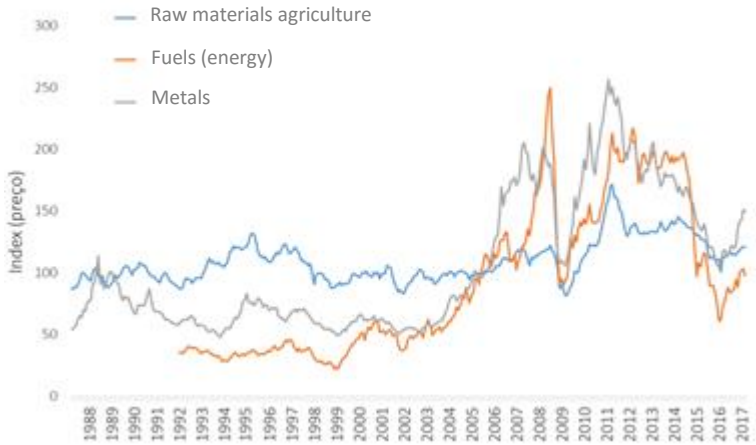


Source: World Resources Institute 2017; UNEP – International Resource Panel, 2016



Source: World Resources Institute, 2017; OCDE, 2012; Plan C, 2017

Price index for three commodities



Source International Monetary Fund, 2017 em http://www.indexmundi.com/commodities/

In 2030, there will be 8.5 billion people on the planet. Over half (56%) will be middle-class consumers. Over half (59.5%) will be living in the major urban centres. The industrial revolution triggered this course: a growing global gross domestic product (GDP), fewer people in extreme poverty (44% of world population in 1981; 10% in 2015), better living conditions and population growth.

The operating system for this development is linear: extract resources which are processed and transformed into products which are then sold and, once their useful life is over, discarded. This is the logic behind everything, from a meal to a book, washing machine, car or building.

The global economy operates on the basis of extracting 65 billion tonnes of materials every year. By 2050, this figure will have doubled. On average, everyone will use 70% more materials than needed in 2005. And with higher consumption, GHG emissions, air pollutants and waste will increase, from extraction all the way along the production chain to the consumer and end of life.

Half of global GHG emissions are due to the production of basic materials and 70% of the waste associated with a product is created before it is even used. At this rate, by 2050 we will need resources equivalent to three planets to sustain our way of life.

This evolution has consequences. In the last 15 years, prices have risen and their volatility has grown. And despite the fall, the structural trends are strong enough for institutions like the World Bank, United Nations and European Environment Agency to point to an increase in these figures in their projections.

Europe is dependent on raw material imports. Domestically, it can only satisfy 9% of demand for 54 essential materials and with this demand subject to increasing pressure, persisting with a linear model is a strategic error that will result in the scarcity and erosion of natural, social and financial capital.

[the portuguese trajectory]

At the moment, no indicators exist to measure how fully circular an economy is. However, it is possible to trace the metabolism of an economy – how it has evolved in terms of extraction, productivity of use, and recycling and emissions/effluent performance.

Portugal's economy has a slow metabolism, i.e. it tends to accumulate materials. It extracts and imports more raw materials than the amount of finished goods it exports, accumulating stock in materials, above all in real estate (e.g. buildings and infrastructure). And in terms of value? Material productivity has evolved more slowly than Spain or Ireland – countries which in 2005 had the same level of productivity. In 10 years, PT improved by 23%, the European Union (EU) by 30% and Spain by 134%.

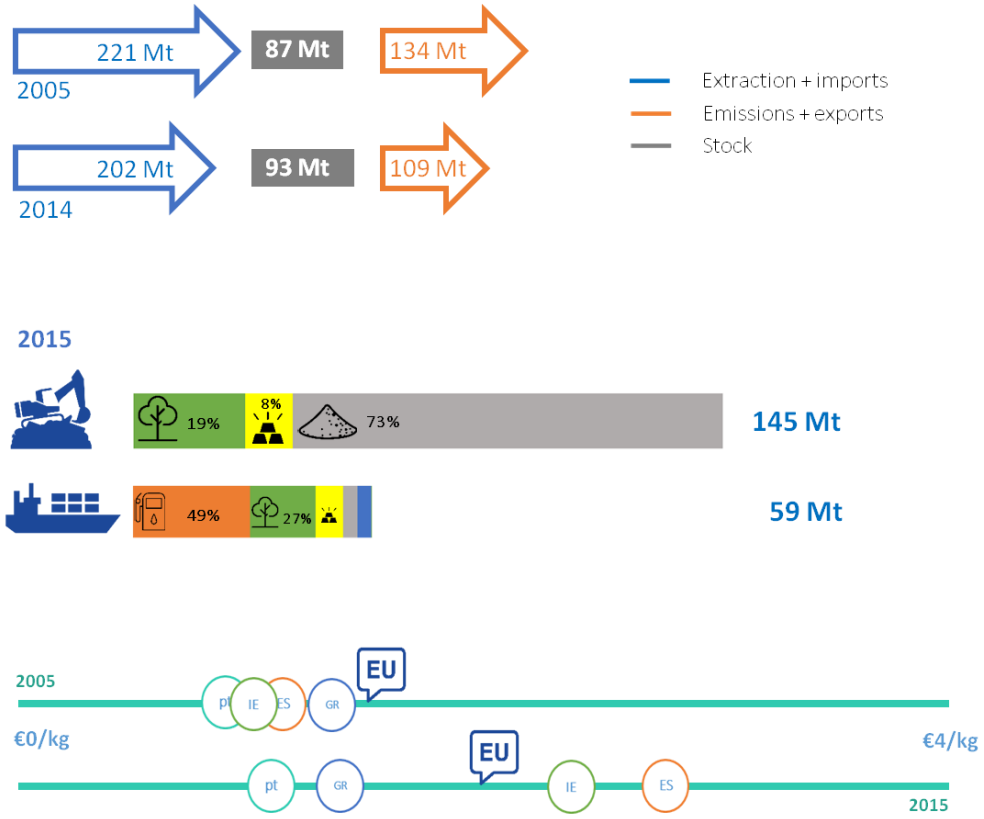
During the financial crisis, domestic materials consumption fell and GDP stagnated. Material and energy efficiency were promoted, a positive measure which continued to be encouraged, but without any disruption in material productivity. From 2014, consumption of non-metallic minerals and biomass grew as the construction sector started to pick up. In 2015, non-metallic minerals (e.g. sand) accounted for 73% of the 145 million tonnes of materials extracted in Portugal.

In terms of water use efficiency, only 65% of what is captured is effectively used and reuse is still residual when compared with other member states. In energy, and despite the focus on renewable sources with a lessening of dependency on external energy, production and transportation is still essentially dependent on imported fossil fuels.

Since 2005, GHG emissions have fallen due to better prevention and control technologies, less polluting fuels and energy production, and improvements in the energy efficiency of processes. The trend in 2015, however, is for rising emissions as a result of economic growth and the use of coal to produce electricity.

Sectoral waste production also fell in the last 5 years (35%), in line with falling production and consumption; but the construction sector predominates. It is responsible for the greatest share of production in all sectors as a whole (40%) and in addition registered an increase in waste production per GDP unit generated. So it is no surprise that in a preliminary study conducted by the working group using the Ellen MacArthur Foundation methodology, construction is one of the priorities, along with transport (e.g. logistics), agriculture, forestry and the food industry.

Portugal: material stocks and productivity snapshot



There is room for progress. For example, manufacturing spends 53% of turnover on raw materials, so reducing this amount, even if only by a small percentage, has a major impact.

Change raises obstacles to action, as some sectors are likely to be "losers". In these cases, it is necessary to encourage companies to adopt a preventative approach, planning their strategies to suit a context of change and reinventing their products, processes or business models where necessary to ensure sustainability when faced with these structural changes.

example

Image credits: PCGuia

MEO - Altice | digitalize, repair, reuse

"With a product-service system there is an incentive for the product to last as long as possible.

The biggest cost is to send a technician or replace the equipment, so there is also an incentive to use quality materials designed to be durable and reusable "

Peter Lacy – Accenture

How Netflix-ication can deliver a waste-free circular economy.

Fast Company (blog), 13/3/2017

When products are transformed into services, the business model is not only based on the sale of the next update. The product 2 service also concerns longevity, reparability and sustainability.

PT was one of the first companies in Portugal to introduce cable and digital TV services, with the provision of personalized content via box: on demand videos, video games, among other services. For a monthly amount, MEO subscribers started to have a service that avoided the purchase of a product - the CD, DVD or Bluray.

Product 2 service has direct impacts on the reduction of raw material needs and indirect GHG emissions. And although these services are more energy-intensive (servers), PT invested on self-consumption by renewable sources and improving its energy efficiency.

But it is not only in dematerialization and digitization that PT has contributed to the circular economy.

PT also recovers and reuses terminal equipment related to the TV MEO offering, which has been damaged or returned by customers by migration to other solutions or services.

To that end, it defined and implemented a reverse logistic operation (collection, sorting, testing, recovery and repackaging in different logistic sites) that has been improved over time.

It started with the equipment that was returned without being damaged and then extended to the faults with warranty and finally the equipment out of warranty. And it has fostered repair partnerships with manufacturers and specialists such as Novabase / Cisco, Motorola, Globaltronic and Altice Labs, even being certified as a repair centre.

The project has been implemented since 2009 and, in 2015, 60% of the total MEO television offer (592,840 equipments) was carried out with reconditioned equipment, which corresponded to a saving of nearly 32 million Euros.

https://www.meo.pt/ecomissao | http://eco.nomia.pt/exemplos

What

[circular economy]

A circular economy is understood as an economy which actively promotes the efficient use and productivity of the resources it has harnessed, via products, processes and business models based on the digitization, reuse, recycling and recovery/regeneration of materials. In this way, it seeks to extract economic value and use from the materials, equipment and goods for as long as possible in cycles powered by renewable sources.

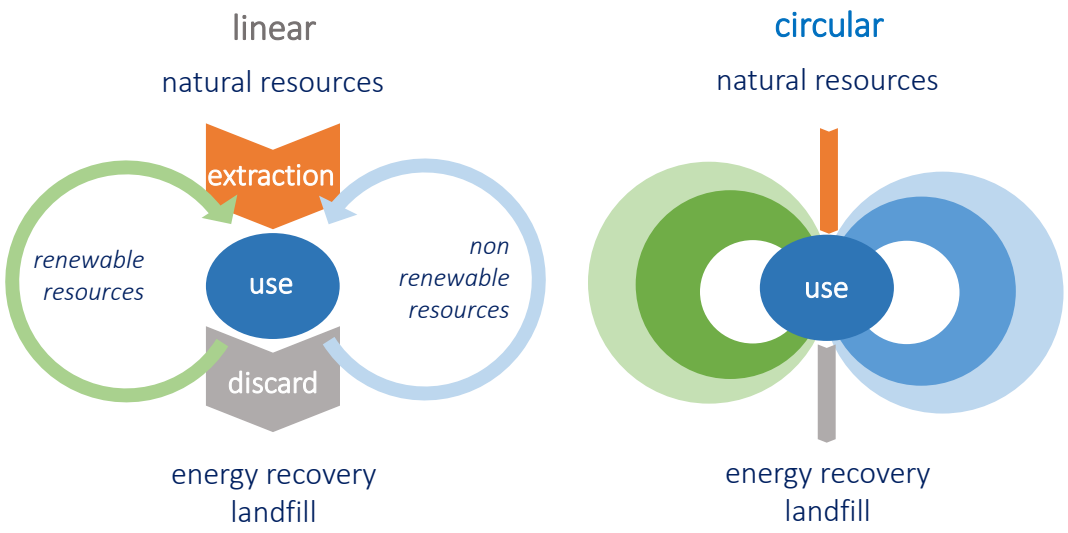
Materials are preserved, restored or reintroduced cyclically into the system with economic benefits for suppliers and users, and environmental benefits due to less extraction and imports of raw materials, reduced waste production and lower associated emissions. This approach goes beyond the demand for efficiency, whose aim is to reduce the material and energy intensity of the production process. This is a crucial step, but increases come from incremental cuts associated with efficiency gains – raw materials are still consumed. In a circular approach, however, more value is extracted from materials already mobilised within the economy. Of course, eventually, materials degenerate; but by prolonging their use for the longest time possible, we gain more in value while extracting far less.

Take a car tyre, for example. Its value and use reside in the number of kilometres it can last without being changed. The maker could sell a certain number of kilometres of use or lease the tyre. In the event of damage, it is returned to the maker who exchanges it for another. The tyre is assessed and repaired and then enters circulation again, or retreaded and sold. If not possible, it can be recycled and the separated materials (textiles, metals, rubber) reused.

This is the approach Michelin is working on and which is valid for other equipment – e.g. cars, bicycles, electrical appliances, mobile phones and clothes. An increasing number of companies are working on this kind of business model. In this way, there is an explicit interest in ensuring a product is designed to last and is easily repairable, as the financial return and reduction in costs for the manufacturer is lower the more durable, useable and in circulation it is.

Linear economy vs circular economy

Source: PBL, 2016



Progress in creating a circular economy is achieved when we evolve from strategies that promote useful applications for materials to intelligent strategies for production and use.

The more "circular" an economy, the less need it has to extract raw materials and the lower the environmental pressure. However, greater innovation in product design, in the revenue model associated with it, and in social and institutional innovation are required.

Circular economy principles

- To design products, services and business models that avoid the production of waste and the pollution of the natural system;
- To keep products and materials in use, at their fullest economic value and utility, for as long a time as possible;
- To foster the regeneration of used material resources and underlying natural systems.

Building-blocs of circular economy

Based on: Ellen MacArthur Foundation, 2017

Design: designing products and services for a circular economy requires designers, engineers and architects with a systemic perspective, knowledge, information and methods. It also requires the experience of those who install, repair and transport – mechanics, electricians and hauliers. It is this combination that has the greatest potential in the approach to the design of materials, reusable components, durable, repairable and separable products, production with minimal waste and environmental impact, use of by-products or waste for new products, and the removal of materials that give rise to concern in the search for alternative and non-impactful substances.

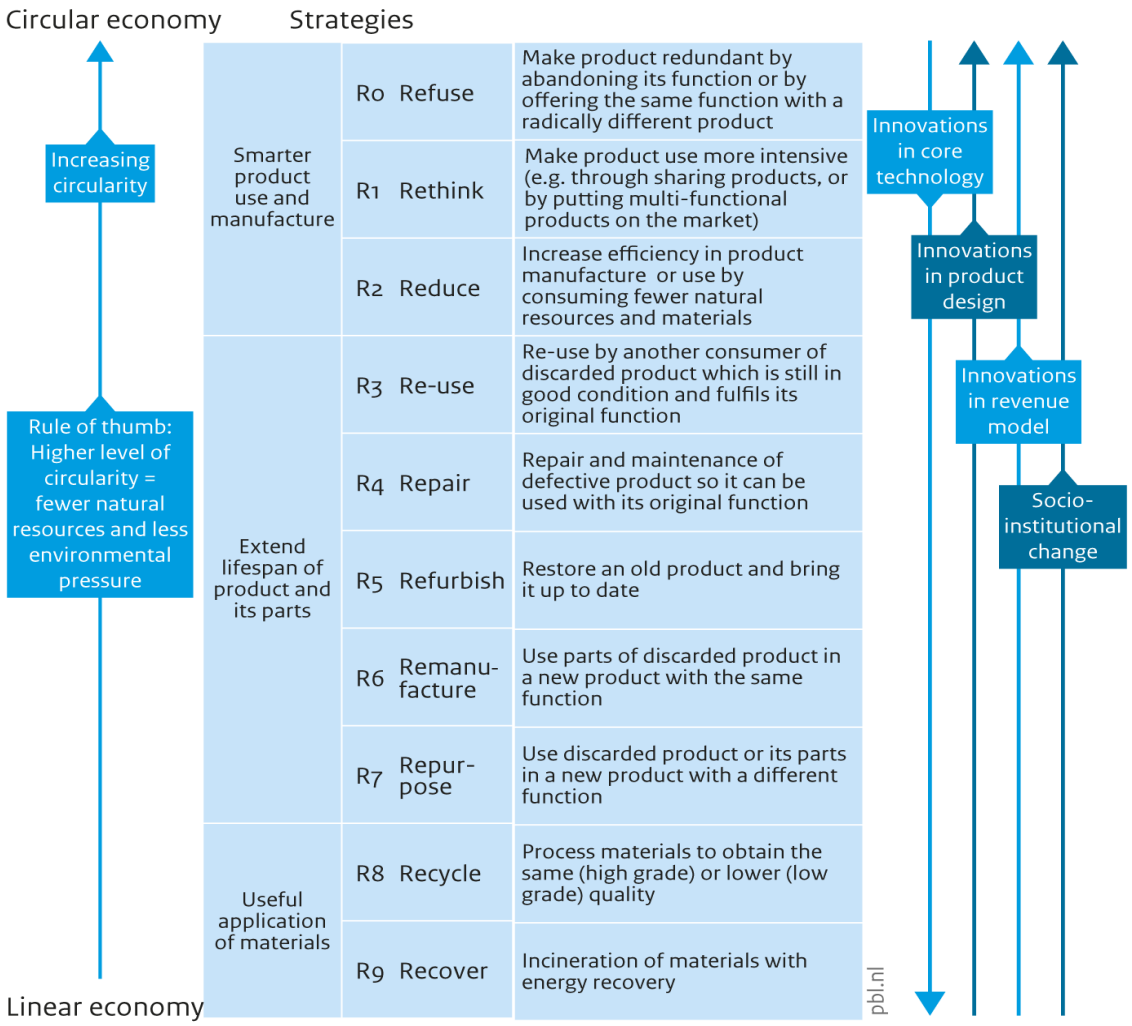
Technologies and new business models: technological innovation is of transversal importance, but the focus has been on strategies of low circularity. This theme needs (greater) inclusion in the innovations triggered by industry 4.0 and tools like blockchain, which are central to speeding up the digitization of processes, product-service systems and collaborative/sharing platforms

Reverse cycles (e.g. reverse logistics): a robust system of reverse logistics that is close to the customer, flexible and effective is a guarantee that products, components and materials will be returned to the manufacturer for new use cycles. Accumulated experience exists (e.g. specific flow management systems) but the diversity of products and materials will require innovation in the logistics of delivery, sorting, storage, risk management, energy and even biology and chemistry (e.g. industrial symbioses, cascading materials). With collection systems, higher-quality cost-efficient processing and effective segmentation of end-of-life products, the loss of materials will tend to decline and circularity increase.

Promoters / favourable context: for it to become common in manufacturing to actively reduce impacts, multiply use cycles, increase resource productivity and value performance over property, the market must be beneficial. So instruments and mechanisms must be designed to suit this context, with the support of political decision makers, financing, teaching institutions, leaders and practical mobilising examples.

Circular economy strategies

Source: RLI 2015, edited by PBL



"10,000 tons of undifferentiated waste today means 1 job if the destination is incineration, 6 jobs if it is landfill, 36 jobs if it is recycling and 296 jobs if it is promoted reuse"

Rreuse, 2015 | Briefing on job creation potential in the re-use sector

Available at: http://www.rreuse.org/wp-content/uploads/Final-briefing-on-reuse-jobs-website-2.pdf

[advantages]

A significant fall in GHG emissions by improved waste management and lower total needs for primary resources (such as energy, water, land and materials), creating positive impacts for the natural system.

Less pressure on habitats, such as the marine environment (e.g. less plastics contamination), through wide-scale reuse, also contributing to the protection of biodiversity.

In the EU, raw materials account for 30 to 50% of production costs. Improving efficiency and productivity by 30% by 2030 will entail annual savings in the order of €600 billion. With multiplier effects, it could reach €1.8 trillion/year.

For example, in Portugal (2015), raw materials account for 53% of manufacturing costs, 42% of agricultural costs and 37% of energy costs. A 30% fall in direct material input (DMI) via higher efficiency and productivity throughout the value chain could increase gross value added (GVA) by €3.3 billion.

The impact on employment is not limited to the sanitation and recycling sector, but also the promotion of design, repair, remanufacturing and associated networks of reverse logistics. There is therefore the potential to foster a major diversity in types of employment, from those requiring higher qualifications – e.g. design, architecture, materials engineering – to those requiring technical and technological qualifications – e.g. repair.

In the EU, the adoption of the legislative proposals contained in the circular economy package could create over 170,000 direct jobs by 2035. And the raising of resource productivity by 30% could create between 1 to 3 million extra jobs by 2030. In Portugal's case, European estimates suggest 57,000 jobs in 2012 were directly related to circular economy activities and 36,000 direct jobs could be created by 2030.

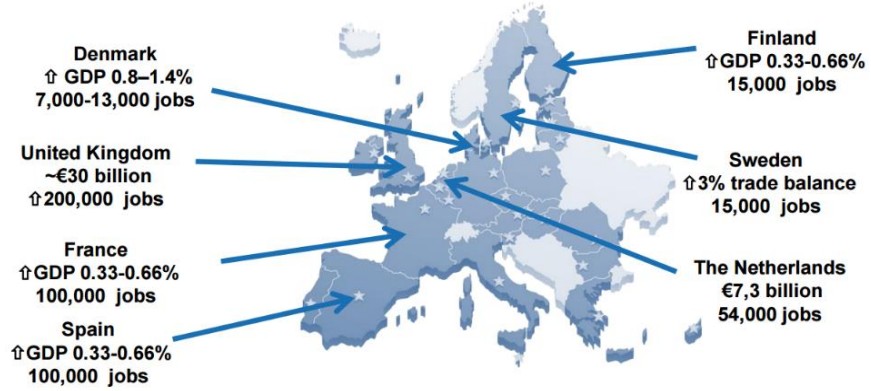
Impact on climate change

Sources: Henry, P. 2016 | IST&3DRIVERS, 2015

EU: transversal	2% a 4% ANNUAL
PT: 3M ton non metallic minerals avoided	5 000 tonnes
PT: 1M ton food waste avoided	247 000 tonnes

Impact on jobs (direct) and in the economy of selected EU countries

Sources: Ellen MacArthur Foundation, Club of Rome, TNO, WRAP – in Jones, 2017



How

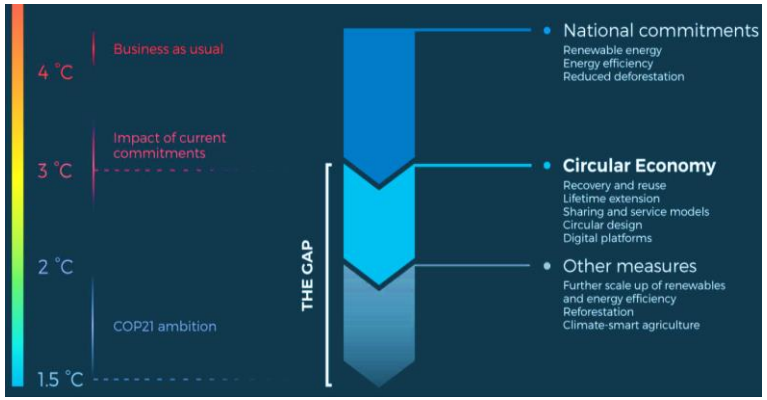
[the international momentum]

The circular economy is now a recurring theme on the international agenda. The necessary revolution requires strategic coordination and alignment as we live in an era of globalisation and worldwide value systems. This change will demand a significant effort from everyone, not just producers and consumers, but governments as well.

The joint stance of international governmental organisations and their show of interest in the circular economy as a vehicle for achieving goals and targets – in green growth, sustainable development, climate change mitigation and adaptation – are important to trigger debate, deepen knowledge and motivate economic and government actors to also seek this alignment.

Paris Agreement

Source: Circle Economy & Ecofys | 2016



Today, the United Nations Framework Convention on Climate Change considers the circular economy a key issue, as over 50% of emissions are linked to the amount of raw materials used.

Higher resource efficiency, greater reuse and recycling, and an absolute cut in raw materials use must therefore be part of climate policy, alongside lower emissions and mitigation.

Sustainable Development Goals

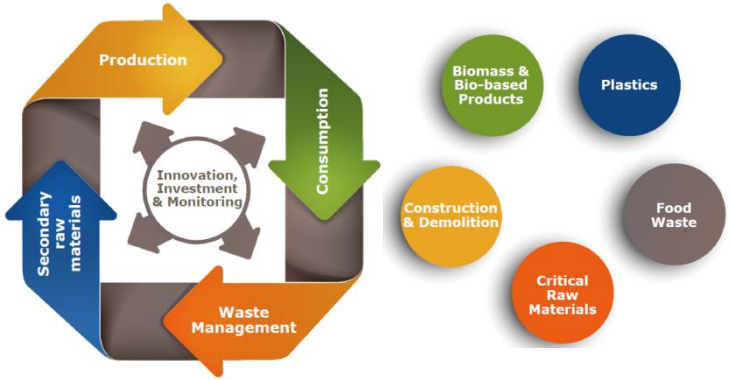
Source: World Economic Forum, 2015

The 17 Sustainable Development Goals (SDGs) adopted by the UN in 2015 have 150 ambitious targets aimed at a systemic change requiring the involvement of multiple interest groups.

Pursuing a circular economy contributes to many of these goals, especially Goal 12: Responsible consumption and production. However, promotion of the regeneration of natural capital, the impact on the built environment, emissions reductions, the reduction of plastic and the economic effects of innovation and employment also impact other SDGs.

European Action Plan for Circular Economy

Source: Henry, P. , 2016



The European Commission sees the transition to a circular economy as an opportunity to modernise and transform Europe towards sustainable competitiveness.

The EU Action Plan for a Circular Economy is the realisation of the EU 2020 initiative – "A resource-efficient Europe". The main benefits relate to security of materials supply (especially the most critical) and their efficient use, resulting in lower absolute quantities of resource flows.

[European examples – focus: green deals going circular]

Various member states have already started work on formulating strategies, road maps and action plans for the circular economy in advance of the European Commission's decision.

They see the circular economy as an inevitable trend and consider that taking early action and adopting a position – at the national and international level – will have major competitive advantages. In this context, it is important to mention an instrument which cuts across various circular economy action plans – the voluntary environmental agreements also known as "green deals", or "innovation deals", in the case of the European Commission.

A "circular agreement" or "circular deal" is considered a voluntary agreement between government and stakeholders (e.g. companies, non-governmental organisations (NGOs), municipalities) to identify and act on non-financial barriers, such as regulations, which restrict or hamper the expansion of the market in products and/or services that create positive environmental and economic impacts.

The agreement is: (i) promoted by the government via calls for expressions of interest from companies, business/industrial associations or NGOs; (ii) limited in time; and (iii) does not involve financing.

Within the scope of the agreement, players work together to remove the barriers identified in order to support innovation, facilitate access to contact and knowledge networks, and create market incentives.

Source: The Courtauld Commitment, WRAP,(UK) 2015a

Commerce – Packaging and food waste(UK)

WRAP – Waste Resources Action Programme

Retailers

Packagers

Producers

Distributors

Food waste action in the production and supply chain (e.g. conservation, donation)

Reduction of primary, secondary and tertiary packaging material

Systems of return, recycling, inclusion of recycled materials in packaging, design

2005-2015

4 M ton

11 M ton

7,4 billion

Financing (WRAP)

Program to support innovation in key areas

Dissemination of good practices, measures

Consumer awareness programs

KLM – Biofuels (NL)

Source: KLM-GD025, Ministry of Environment(NL) | 2015

KLM

Ministry of Economy, Agriculture & Innovation

Ministry of Infrastructure and Environment

Sustainability Standards

Innovation: Cost-efficient and sustainable combination of biomass

Corporate biofuel program: members pay additional fee

Waste-to-energy: bioresidues for fuel (20 ton / day)

+200 flights in Europe (AMS-PAR) with 2nd and 3rd generation biofuels

Transatlantic flights since 2013

Reduction in costs of waste management, less CO2 for companies adhering to Corporate Biofuel

Adaptation of laws and regulations, temporary exceptions

Support for sustainability standards in aviation

Promotion of the corporate biofuel program

Planning

"We have to know how to be more productive with our resources and move towards a more circular economy. Most of the technologies we need we already have. The challenge is how to accelerate the pace of change. “

[*Karmenu Vella.* Commissioner for Environment, Maritime Affairs and Fisheries. 2016]

Ambition

For an integrated transition policy, it is important to establish an ambition for Portugal for 2050. Often this exercise is undertaken internally within the context of individual ministerial programmes; but if suitable for all actors – government, companies and citizens – actions will be conceived, developed and executed, whether political, operational or behavioural, from a systemic perspective and their impacts immediately judged.

The ambition set out for Portugal 2050 was designed to leverage and spur development of work within the Action Plan for the Circular Economy (APCE) and must be appropriated by the various ministries, civil society and private organisations. It consists of the following elements:

- A carbon neutral economy that is efficient and productive in its use of resources: neutral GHG emissions and effective use of materials (a significant fall in the extraction and importing of materials, a significant fall in final waste generated, better management and value extraction from the resources in circulation);
- Knowledge as impulse: focusing on research and innovation creates solutions – in products, services, business models, consumption/use, behaviour – with lower emissions and resource intensity, integrated into business models that spur job creation, efficient and effective use of mobilised resources, and their lasting economic value;
- Inclusive and resilient economic prosperity: economic development that impacts all sectors of society, is resilient against price and risk volatility and gradually decoupled from negative environmental and social impacts;
- A flourishing, responsible, dynamic and inclusive society: an informed, participative and more collaborative society – a society guided by being and caring, rather than wanting and possessing and which conserves and cares for its natural capital

Approach

The transition to a new economic model is not an easy or rapid process. It requires a systemic approach that cuts across various components of society; it cannot therefore consist merely of top-down (government) or bottom-up (users/consumers, companies, regional and local authorities and municipalities) actions. It must be an interactive process which requires cycles of learning by those involved.

This plan is based on an understanding and experience common to four areas of government (science, technology and higher education; economy; environment, agriculture, forestry and rural development) comprising the inter-ministerial group which drafted the APCE, henceforth "inter-ministerial group". This involved a survey of current performance, known measures, an analysis of the European action plan, and benchmarking against other circular economy plans, from which actions were proposed with their respective guidelines.

In this first phase, the focus will not limit to policy instruments but also on raising the awareness, mobilization and responsibilities of stakeholders. This entails having points of interaction – e.g. via meetings, discussion forums, support for sectoral/regional projects – where new knowledge can be generated that will spur new action cycles.

Considering the evolution of this issue on the national and international agenda, where policies and knowledge are developing rapidly, it was decided to opt for a more flexible approach, i.e. based on 7 macro-actions substantiated by actions instigated at the sectoral and regional scale and whose guidelines should move forward by 2020. At the end of that year, an assessment and review will be conducted that may entail making adjustments (e.g. to duration, coverage), changes (e.g. new regulations) and/or suggestions for new actions. A new cycle will then begin, which will be renewed every 3-5 years.

The governance model adopted brings together the necessary facets to be able to advance the guidelines via specific instruments, such as circular agreements, and combine the support, monitoring and feedback necessary to assess and adjust the APCE. Three levels of actions were considered:

- Macro: actions structural in scope that produce transversal and systemic effects which enable society to appropriate the principles of the circular economy;
- Meso (or sectoral): actions or initiatives defined and accepted by all players in the value chain of sectors relevant to raising productivity and the efficient use of the country's resources, seizing the economic, social and environmental benefits;
- Micro (regional/local): actions or initiatives defined and accepted by all regional and/or local government, economic and social actors which incorporate a local economic aspect and which emphasise this in the approach to social challenges.

The different levels of actions are inter-related and reinforce each other positively, creating feedbacks that evolve the context iteratively and allow knowledge, policies, projects and results to be consolidated, spurring the actors involved.

The macro level uses the same rationale as the EU's action plan for the circular economy – product, consumption, waste/secondary raw materials – with knowledge as the key element for the development of solutions. The actions in this first cycle foresee:

Measures already underway by the ministries involved in drawing up the APCE and which it is hoped to strengthen (e.g. food waste, sub-products, research and innovation, education);

New actions on "key" themes identified, such as reuse and regeneration, and consumer incentives.

To ensure objectivity, effectiveness and efficiency, transversal themes with greater short and medium-term impact that promote inter-ministerial collaboration are highlighted.

But speeding up transition to the circular economy involves more than just this plan: other policy instruments, such as carbon neutrality, land planning, the blue economy, organic agriculture, youth entrepreneurialism, SIMPLEX, green public procurement and urban regeneration also contribute to the same end. It is hoped, therefore, that in the wake of this plan there is a consolidation of these instruments in the different areas of government. Examples of this are the Ministry for Maritime Affairs' promotion of the circular economy and initiatives related to removing plastic from the oceans, the Secretary of State for Youth and Sport's adoption of the circular economy as a theme in its programme Empreende Já ("Get Enterprising"), and the references to the circular economy in the National Territorial Cohesion Plan (Point 3: territorial capital).

At the meso level, the focus is sectoral, in the understanding that, for the purposes of the APCE, "sector" refers to the whole of the value chain associated with a certain activity. For example, the construction sector covers not only contractors but also the whole supply chain associated with constituting the product (the building), from the minerals and components used to their commercialisation, maintenance and end of life.

In this context, it is essential that each sector develops its own transition agenda, appropriating the knowledge inherent to this process that can be complemented by instruments such as circular agreements. The APCE's lines of action for this level are thus essentially guidelines that can be used by the sectors identified and complemented with other initiatives developed by them.

The agribusiness sector, despite being important in this context, has a specific macro-action ("eat without waste") and can also be addressed in the context of distribution and retail, above all via the actions on packaging and food waste.

The construction sector is highlighted for its intensive use of primary resources, low materials productivity and low level of circularity. The textile and tourism sectors are noted for their export-oriented approach and importance in terms of resource efficiency – e.g. the fast fashion industry is one of the world's most polluting industries globally.

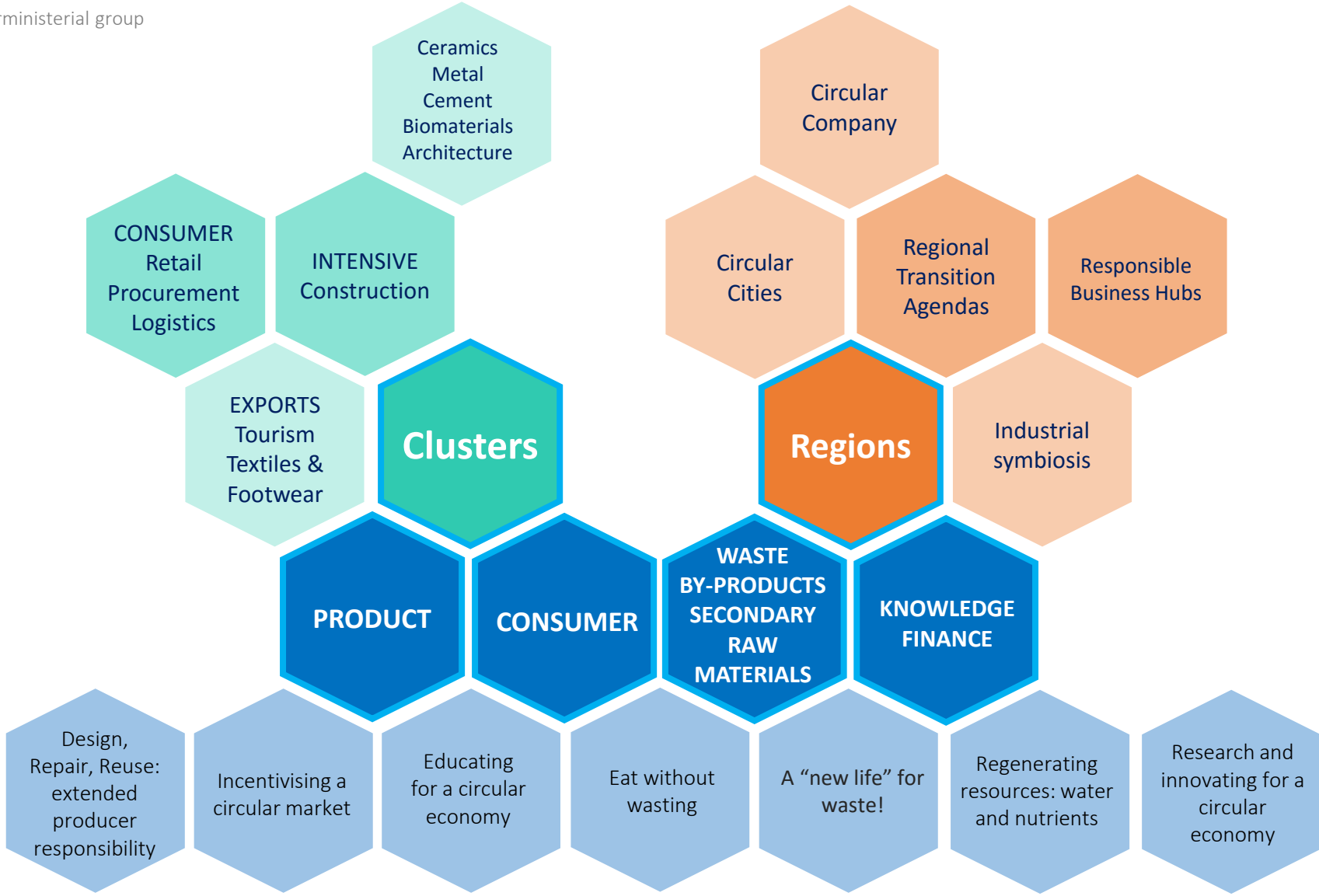
At the micro level, the focus is on the regions and speeding up strategies for the circular economy that are most appropriate for the socio-economic profile. In the first phase, an overall vision for each territory is necessary in regional agendas initiated by the Coordination and Regional Development Commissions (CCDRs) that can be leveraged by the Operational Programmes.

In designing these agendas, the local sector must be involved, either via local authorities, inter-municipal communities (CIM) or metropolitan areas. An example is the interlinking with programmes underway, such as the Mission Unit to Enhance the Interior (UMVI). These entities must also adapt the guidelines on the circular economy within the context of their own skills and sphere of action.

It is at this level that the circular economy converges with territorial enhancement, so some of the developmental cornerstones of these agendas are presented, bearing in mind the work underway in some regions (e.g. industrial symbioses) and also emerging themes in the national and European context, such as the management of the urban and peri-urban metabolism.

Action levels

Exercise resulting from the framework and analysis carried out by the interministerial group

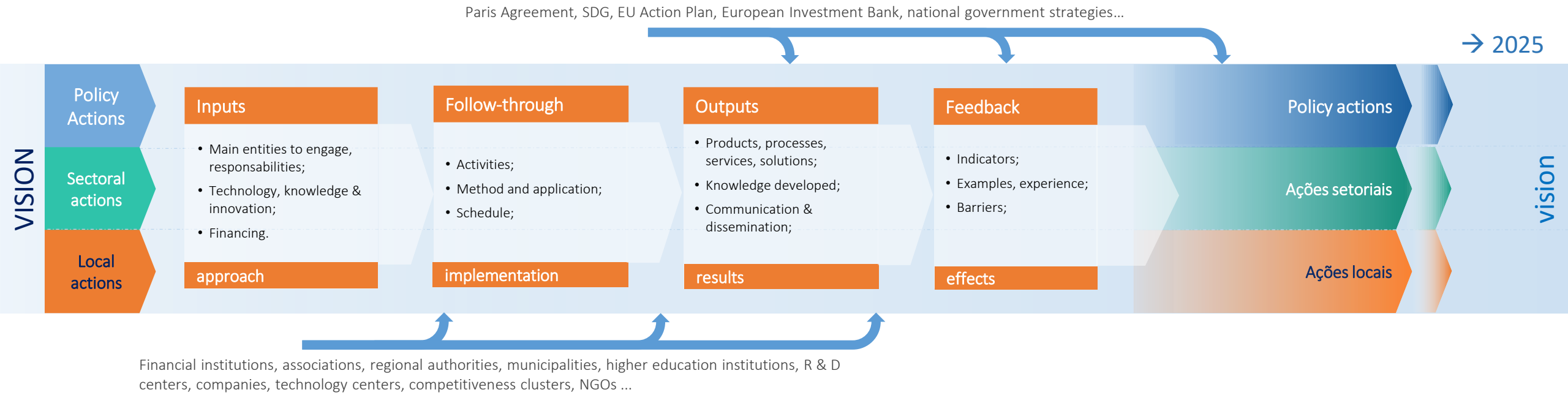


A "Middle-Out "Action Platform for Circular Economy

Based on: Costa e Ferrão, 2010 | EPA Network, 2017;

An action platform consists of *regularly and systematically held initiatives that enable interaction between governance actors (e.g. public institutions) and circular economy implementation actors (e.g. companies, municipalities, consumers) to exchange knowledge, contacts, experiences and good practices.*

A strong platform has a wide range of coordinated initiatives that stimulate interaction between actors, from websites (e.g. ECO.NOMIA) to events for exchanging/spreading knowledge (e.g. national and international conferences, workshops, training courses, world cafés), promoting networks (e.g. circular cities network, Horizon 2020 projects network, ECO.NOMIA companies network), accelerating solutions (e.g. ideas contests, specific calls, awards) or national and international notification of outcomes (e.g. newsletters, dissemination of Portuguese initiatives, English language communiqués).



Governance model

[goals and targets]

The circular economy is not a goal in itself. Rather, it is a reorganised economic model focused on coordinating production and consumption systems in a closed loop. The APCE does not, therefore, set specific targets since it aims to contribute to the attainment of set goals in different plans and strategies that work towards the same end. An example at the national level are the goals and targets set out in the waste plans, water and sanitation plans, climate action plan and energy plan, and also the goals advocated at the European and international level (sectoral directives, Portugal 2020, Paris Agreement and SDGs).

However, so that all players have the same benchmark goals for Portugal in 2020 and 2030, it was decided to add the strategic macro-goals and respective targets to which Portugal is bound and which express the effect of transition to the circular economy.

The macro-goals benchmarked in this first phase are set out in the Green Growth Commitment and proposed under the National Reform Programme. As regards the innovative instruments presented in the APCE – circular agreements, sectoral agendas and regional agendas – binding goals are envisaged which will only be set out and defined at the time of implementation. To understand their impact on the transition to the circular economy, the aim is to quantify and establish the relative contribution of each instrument to achieving the aforementioned macro goals.

The governance model adopted shall review the progress achieved via a monitoring system that is to be consolidated, and in view of these targets assess the size of effort, outcomes and impact.

Strategic instrument	Goal	Indicator	Unit	Base information		2020 TARGET	2030 TARGET
				Year	*Figure*		
National Reform Plan	*Territorial enhancement*	Increase urban waste prepared for recycling	%	2016	38%	50%	65%[1]
		Cut biodegradable urban waste going to landfill	%	2016	41%	35%	10%[2]
		Cut primary energy use in all sectors	Mtoe	2015	21.7	22.5	3)
Green Growth Commitment	*Promote the efficient use of resources*	Raise resource productivity in the national economy (LCC - GOAL 4 / PNGR)	€/t	2013	1.14	1.17	1.72
		Increase the incorporation of waste into the economy (LCC - GOAL 5 / PNGR)	%	2012	56%	68%	86%
		Focus on urban rehabilitation (LCC - GOAL 6)	%	2013	10.3%	17%	23%
	Contribute to sustainability	Raise energy efficiency (cut energy intensity) (LCC - GOAL 7 / PNAEE)	toe/€m GDP	2013	129	122	101
		Raise water efficiency (LCC - GOAL 8 / PENSAAR2020)	%	2012	35%	25%	20%
		Cut CO_2 emissions (LCC - GOAL 10 / PNAC 2020-2030)	Mt CO_2 eq.	2005	87.8	68-72	52.7-61.5
		Boost the share of renewable energy (LCC - GOAL 11 / PNAER)	%	2013	25.7	31%	40%

Notes: 1) and 2) targets currently under negotiation in the context of the European Commission's legislative waste package: 1) for urban waste recycling in 2030; 2) maximum urban waste in landfills. In the case of 3), the target for 2030 is now set by the "Raising Energy Efficiency" target;

[management]

Given the strategic and transversal nature of this transition, it is important that the governance model consists of components which convey: (i) a political commitment to the theme; (ii) effective support and action on transition progress.

The governance model covers the following levels:

- An Inter-ministerial Commission: a decision-making structure at the political level charged with aligning the theme of the circular economy with the work underway, under the Inter-ministerial Committee for Air and Climate Change (CIAAC), created by Ministerial Council Resolution No. 56/2015 of 30 July, to avoid duplication of effort.

  Close liaison with other inter-ministerial commissions must be ensured, such as the Foreign Policy Commission (CPE) and the Partnership Agreement Coordination Commission (CCAP), given the importance of the theme for European development and financing policy, as well as for the compliance with national commitments like the SDGs. Political oversight is thus ensured, priorities set out and responsibilities and implementation periods validated;

- APCE Coordination Group: includes representatives appointed by the ministers for European affairs, tax, local authorities, science, technology and higher education, health, planning, economy, environment, agriculture, forestry and maritime affairs, coordinated by the representatives appointed by the minister for the economy and the environment, with a view to spreading the principles of the circular economy in government policies, promoting and facilitating the execution of the APCE's guidelines and ensuring the linking and national contribution to the measures in the EU Action Plan for the Circular Economy.

The following actions are identified in the short term:

- Survey and interlink of current policies and those under development: to promote the consolidation of policies that impact on the transition to the circular economy and ensure the options and goals of different policy areas are linked (e.g. National Program for the Territory, Road Map for Carbon Neutrality, National Science & Technology Plan);
- Activities Plan: to realise the responsibilities, activities and timeline for the actions;
- Portugal 2020 Environmental Network: to boost the network in line with Article 61.2e) of Decree Law No. 137/2014 of 12 September to harmonise environmental criteria in the operational programmes and support for establishing specific lines of investment (reprogramming);
- Circular agreements: to establish the protocol associated with "circular agreements";
- Interaction with stakeholders: to establish a network and interaction with specific stakeholders (e.g. National System of Policies and Measures (SNPM), Green Growth Coalition, National Council on Environment and Sustainable Development (CNADS), Economic and Social Council (CES), National Association of Portuguese Municipalities (ANMP) and circular economy working groups, and those belonging to the Portuguese Association of Sanitary and Environmental Engineering (APESA), Society of Engineers, amongst others);
- Monitoring: to establish a "protocol to monitor and check monitoring needs" to gauge the need for information (existing or which needs to be created) in order to better measure national progress in the transition to the circular economy;
- ECO.NOMIA portal: should be capable of better aggregating and divulging all information developed by the Coordination Group on the circular economy and also consider the prospect of making external and international communications.

[finance]

Access to financing plays a key role in stimulating innovation in the context of the circular economy, both via programmes run at the European level (Horizon 2020, LIFE Programme, COSME, EEA Grants, European Fund for Strategic Investments (ESIF), Climate-Kic, Bio-Based Industries Public-Private Partnership (BBI), amongst others) and via European Funds and Structural Investment Funds, implemented through Portugal 2020, or even strictly national programmes, all run by a huge range of entities, to which are also added emerging forms of funding such as collaborative financing or green bonds.

The figure shows the exercise resulting from the framework and analysis by the inter-ministerial group, limited to major national and European initiatives/programmes/instruments which, individually or interconnected (as desired), may represent financing opportunities for the circular economy. It does not necessarily consider all available financing opportunities.

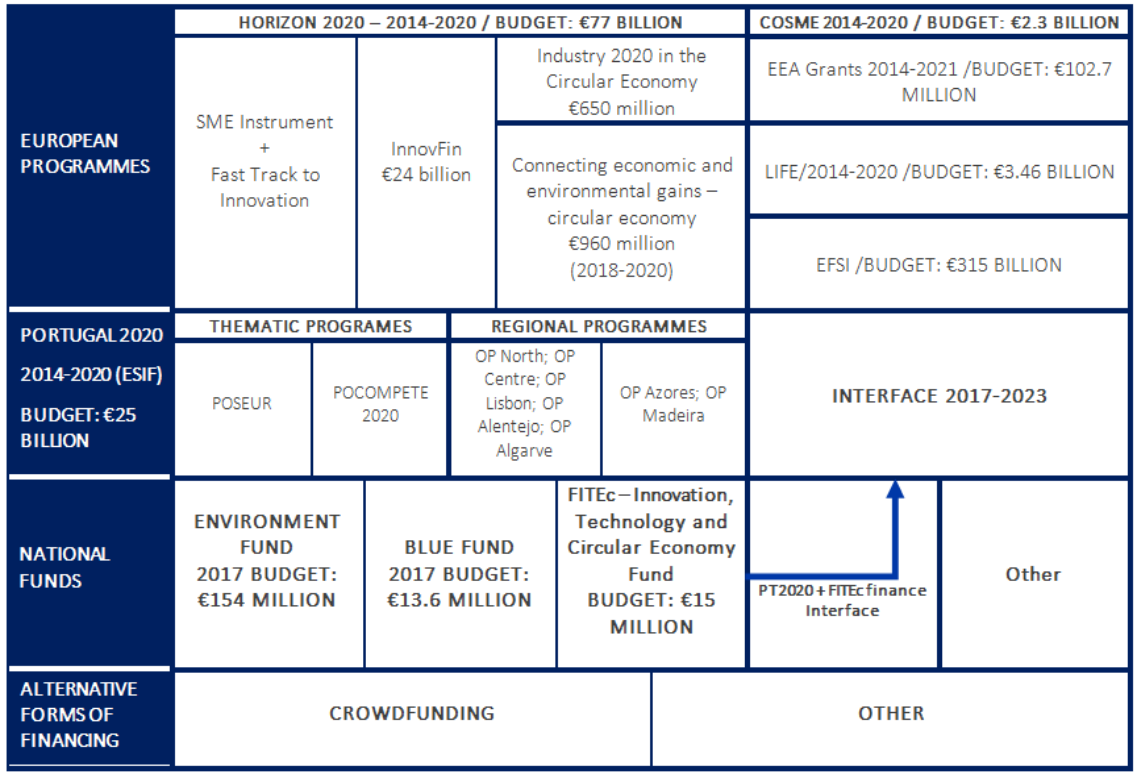
In the context of the Coordination Group, a specific team will be set up for the financing component with bodies appointed by ministers responsible for finance and development and cohesion, representatives of the managing bodies of the Portugal 2020 Operational Programmes, Portuguese Environment Agency (APA), IAPMEI, Science and Technology Foundation (FCT), National Innovation Agency (ANI), Development Finance Institution (IFD), ANMP and representatives of the Enterprise Europe Network (EEN).

This team shall collaborate to update and centralise the information on the financial and tax support mechanisms available to companies interested in investing in the circular economy (e.g. the "Circular Economy Voucher" initiative presently being prepared by the Ministry for Economy), compile and analyse the outcomes of these mechanisms, identify gaps and propose solutions, and draw up proposals to support projects, enabling the use of European Investment Bank (EIB) and ESIF financing.

Work is being conducted to provide a single source of consolidated information on the financing available to companies in the "Opportunities" section of the ECO.NOMIA portal, though other mechanisms to centralise information may be developed.

Main financing opportunities available

The following figure presents the exercise resulting from the framework and analysis carried out by the interministerial group, limited to the major national and European initiatives / programs / instruments which, individually or in combination (as desired), may represent financing opportunities for the economy Circular. It does not necessarily include all available funding opportunities.



Although the diversity of funds available does not allow applications to be brought together under a single one-stop-shop, the importance of support to implement the respective application processes is understood. Special focus is therefore given to the European Enterprise Network (EEN) in Portugal with regard to promoters and to boost the network's performance in this area, and also to disseminate tools the EC is employing in the field of efficient use of resources under the COSME programme.

example

Innovation deals| governing for circular economy

Image: European Commission

"The Innovation Deals is an instrument towards a more modern and responsive administration that helps innovators facing regulatory obstacles to innovation in the existing EU legislative framework."

Carlos Moedas, Commissioner for Research, Science & Innovation

"This first 'Innovation Deal' on water helps in our push for a circular economy. It comes as we are about to check how European water policy is working. We want our policy to be simpler to put in place and easier to use. The Innovation Deal helps us do this"

Karmenu Vella, Commissioner for Environment, Maritime Affairs and Fisheries

The Commission Communication "Closing the loop - An EU action plan for the circular economy" introduces the concept of innovation deal as "a pilot approach to assist innovators facing regulatory obstacles (e.g. legal provisions ambiguous), establishing voluntary agreements with interest groups and public authorities ".

The voluntary nature, without funding involved, opens the way for the establishment of an open and transparent platform in which participants undertake to collect and share knowledge, inform relevant stakeholders, collaborate to establish the facts associated with an alleged barriers to innovation.

Through these mechanisms, the Commission hopes to proactively help national, regional or local authorities to identify and use the existing flexibility within the EU legislative framework or to implement specific legal provisions in an appropriate way, providing a thorough examination of the case.

Sustainable use of wastewater treatment using bioreactors of anaerobic membranes

This innovation agreement addresses legislative barriers to wastewater use. This technology facilitates the extraction of energy and nutrients and accelerates the reuse of treated water for irrigation, helping to overcome the challenges of water scarcity. The agreement explores the paradigm shift from a wastewater treatment plant to a water resource installation.

From Electric Mobility to Recycling: The Virtuous Cycle of the Electric Vehicle

The main objective of this agreement is to increase access to electric mobility, reducing the total cost of electric vehicles. This can be done by optimizing vehicle battery usage throughout its life cycle (from smart car and vehicle-to-network - to stationary storage services).

https://ec.europa.eu/research/innovation-deals

example

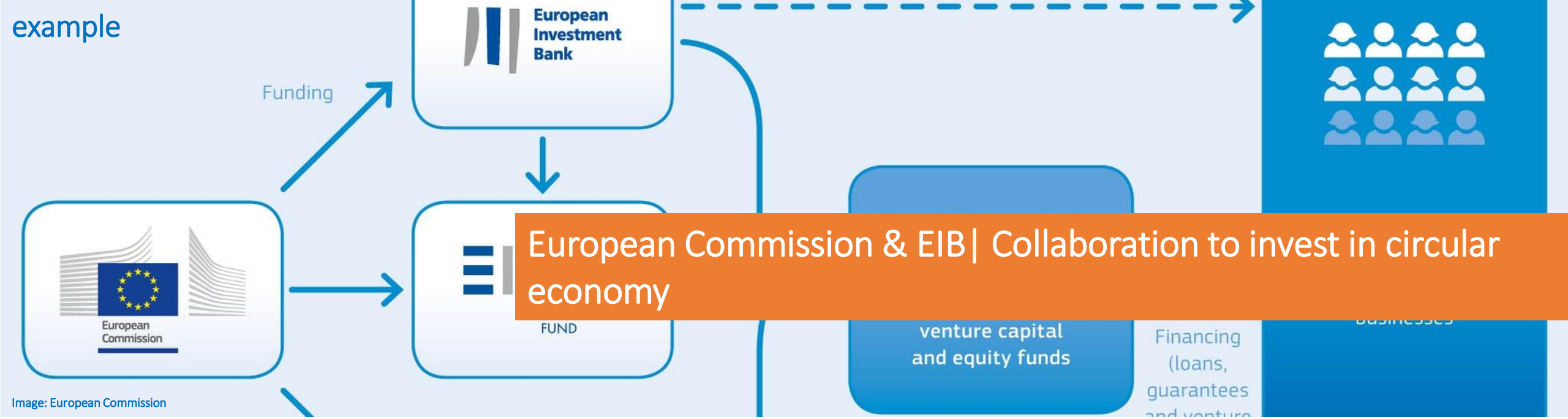


Image: European Commission

European Commission & EIB| Collaboration to invest in circular economy

"The EIB is pleased to join forces with the European Commission and use our combined financial firepower and expertise to make our economies more circular.

(…)we see the circular economy as key to reversing the course of climate change, making more sustainable use of our planet's scarce resources, and contributing to Europe's growth.

To accelerate this transition, we will continue to advise and invest increasingly in innovative circular business models and new technologies as well as in more traditional resource efficiency projects. "

Jonathan Taylor, Vice-President of the EIB

One year after the adoption of the Circular Economy Package, the European Commission has stepped up measures to establish a Financial Support Platform for the Circulars, together with the European Investment Bank and the European Investment Fund.

The goal is to bring together investors and innovators to work together on the barriers and identify opportunities and priorities for investment in this area.

The platform will have a consultative body, for which applications are open until June 9, and which may involve NGOs, ministries and national institutions and commercial and investment banks.

The platform will use the impetus given by the Juncker Plan, strengthening the link between existing instruments such as the European Fund for Strategic Investments, InnovFin (supported by Horizon 2020) and will examine the development of new financial instruments specifically dedicated to the Economy Circular.

The Platform will bring together the Commission, the EIB, national promotion banks, institutional investors and other stakeholders, raising awareness of investment opportunities in the circular economy and promoting best practices among potential developers by analyzing projects and their financial needs and providing advice on structuring and feasibility of funding.

The amount of investment has not yet been disclosed, but according to the Commission in September 2016, the Juncker Plan raised about € 116 billion in its first year. The 3-year plan expects to raise a total of € 315 billion and € 21 billion will be the initial European capital.

According to the Commission, the objective is to increase public and private investment and lower barriers to new business models, which have new costing models and an increasing potential for development.

http://europa.eu/rapid/press-release_IP-17-104_en.htm

[measure]

Main indicators

Exercise of the interministerial group

Based on: Ellen Macarthur Foundation

AREA		Indicator	Past (2005)		Present (2016)		PT/ EU	Change 2005-2016	
			PT	EU	PT	EU		PT	EU
RESOURCES	PRODUCTIVITY	**Resource productivity (€/kg)** Defined as gross domestic product (GDP) divided by domestic materials consumption.	0.891	1.5456	1.08	2.07	52%	21.36%	34.11%
		Productivity of artificial areas (PPP (purchasing power parity) millions per km²) [2009 (corresponds to just 23 countries, not including BG, CY, HR, MT, RO); 2012] Defined as a country's gross domestic product (GDP) divided by its total artificial areas. Artificial areas: urbanised areas (surfaces covered with buildings and greenhouses) except towns (roads and sealed surfaces). Shows whether the productivity of built artificial areas is used efficiently to generate added economic value.	44.8	71.5	48.5	80.8	60%	8.26%	13.01%
ENVIRONMENTAL IMPACT	MATERIALS	**Domestic materials consumption (ton/ capita)** Defined as the total amount of materials used directly in the economy and is equal to direct material input (domestic extraction plus imports) less exports.	18.65	16.03	15.58	13.02	120%	-16.45%	-18.79%
	ENERGY	**Energy productivity (€/kg of oil equivalent)** Defined as GDP divided by gross domestic energy use in a certain calendar year.	6.40	6.70	7.50	8.30	90%	17.19%	23.88%
		Share of renewable energy (%) Percentage of renewable energy compared to total energy consumed	19.50	9	28	16.70	168%	43.59%	85.56%
	EMISSIONS	**GHG intensity in energy use (Index 2000=100)** [-; 2015] Ratio of energy-related GHG emissions (carbon dioxide, methane and nitrous oxide) to gross domestic energy use.	97.60	96.80	87.80	89.10	99%	-10.04%	-7.95%
		Per capita GHG emissions (tons of CO_2 eq per capita) [-; 2015]	8.63	10.81	6.95	8.75	79%	-19.47%	-19.06%
TRANSFORMING THE ECONOMY	TRANSFORMING WASTE INTO A RESOURCE	**Waste production excluding mineral waste, dredging waste and contaminated soils (kg/capita)** [2004;2014]	1825	1907	1184	1716	69%	-35.12%	-10.02%
		Landfilling rate with the exclusion of mineral waste, dredging waste and contaminated soils (%) [2010; 2014] Defined as the volume of waste sent to landfill (directly or indirectly) divided by the volume of treated waste (exclude mineral waste, dredging waste and contaminated soils).	43	29	31	25	124%	-27.91%	-13.79%
		Urban waste production (kg/capita) [-; 2014]	452	515	453	477	95%	0.22%	-7.38%
		Urban waste landfilling rate (%) [2010; -]	62	38	34	-	-	-45.16%	-
		Urban waste recycling rate (%) [-; 2014]	15.20	n.d.	30.40	43.70	70%	100%	-
		Packaging waste recycling rate (%) [-; 2014]	44.30	n.d.	57.10	65.50	87%	28.89%	-
		Electrical and electronic waste recycling rate (%) [2008; 2014]	21.80	n.d.	42.70	n.d.	-	95.87%	-
	SUPPORTING RESEARCH AND INNOVATION	**Eco-innovation index** (EU=100) [2010; -] Index with 16 indicators (e.g. green investment, jobs, patents)	72	100	95	100	95%	31.94%	-

- ; n.d: not available
[xxxxx; yyyy]: when the reference dates for the data are different from 2005 (for the past scenario) or 2016 (for the current scenario). Where not indicated, 2005 and 2016, respectively, should be assumed;

The transition to a more circular economy where the value of products, materials and resources is kept in circulation for as long as possible and the extraction of materials and production of waste minimised is an opportunity not a cost. Given imminent constraints, the EU's efforts to speed up this transition to make a more competitive, effective and sustainable economy and to create more jobs is noteworthy. In that sense, it is important to be able to assess the progress made and determine if policies and actions are contributing to these goals.

Existing indicators focus on material inputs, production and emissions. This approach is limited because, for example, indicators exist to measure recycling but not yet for other elements of circularity, such as sharing, reusing and repairing.

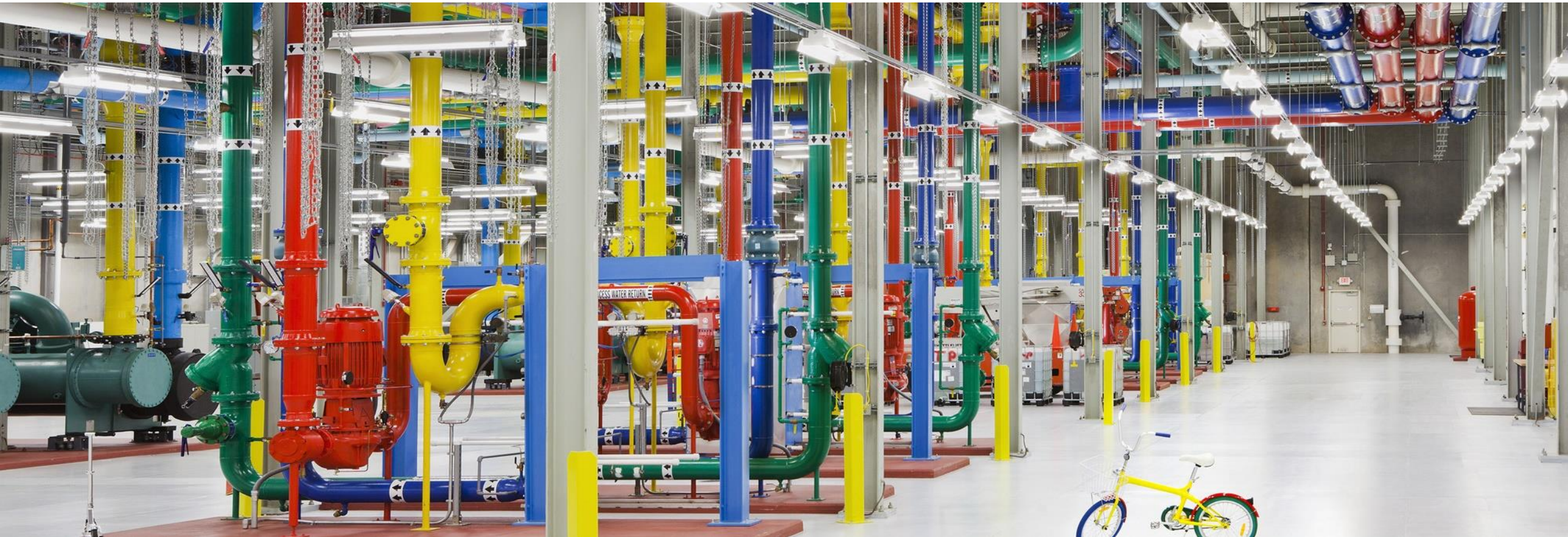
Measuring progress in "circularity" may not be feasible with the current state of knowledge and availability of data, but it is, however, important to follow its development – and to address this gap, the EC is developing a monitoring framework for the circular economy in which member states will participate.

A protocol will be developed to follow and verify monitoring needs by the Coordination Group which will define complementary indicators to show the state of transition at the national level by sector and intervention area. This will benefit from work already undertaken by, for example, by the Green Growth Coalition. Whilst not gauging the entire size and scope of the circular economy, the metabolism indicators may be considered "close" as their selection is based on the document "Delivering the Circular Economy - A toolkit for policymakers" published by the Ellen MacArthur Foundation, with figures supplied by Eurostat.

Action

"Google saves hundreds of millions of dollars every year by managing its servers effectively, Brandt said. It first focuses on maintenance and using the servers as long as possible. Next, it refurbishes old servers and re-manufactures them. Then it sells parts to secondary markets and what's left it recycle."

[*Kate Brandt.* Sustainability Lead at Google]



Explaining actions

Macro-level actions were organised by files with the main details to take into consideration for their development and execution. Below are the details contained in each file.

It is notable that the final files, setting out the guidelines and respective awarding of responsibilities and scheduling, can only be completed after the consolidation of the current policies of the various ministries, in the context of the work associated with the Coordination Group, as they are part of their plans of activities. The consolidated files will be updated on the ECO.NOMIA portal

NAME	Title of the action, indicating the components it is aimed at (product – consumption – waste and secondary raw materials – knowledge)
GOALS	Main characteristics or outcomes associated with the transition to the circular economy it is hoped to achieve by implementing the proposed action
KEY SECTORS	Sectors the action is aimed at and/or on which it will have the most impact
ROLES OR ENTITIES TO BE INVOLVED	Entities with expertise and/or technical capability to implement the guidelines. In some cases, the role an entity can play in this process is also proposed
GUIDELINES	Directives allowing the implementation of an action to advance and contribute to the goals and which, in later stages, must be reviewed and modelled according to the data generated
LEVEL OF PROGRESS	Indication as to whether an action has been initiated bearing in mind the guidelines
SDG/EU/PT	Indication if an action has contributed to international/national commitments
COMPLEMENTARY INDICATORS	Indicators that can be used, or measured, according to an established methodology to monitor the outcomes associated with an action; they are subject to review at the time the monitoring protocol is established
REFERENCES	References to legislation or relevant studies to consolidate knowledge associated with an action

1. Design, Repair, Reuse: extended producer responsibility [product – consumption]

GOALS	• To reuse more products, namely those addressed by extended producer responsibility and others for mass consumption (e.g. school books); • To reduce waste production; • To contribute to a view of products as having multiple useful lives (less obsolescence);
KEY SECTORS	• Entities managing specific waste flows: electrical and electronic equipment, vehicles, tyres, packaging, batteries, oils; • Producers in other economic sectors (e.g. mattresses, textiles, furniture, paper production, production and publication of content, printers);
ROLES OR ENTITIES TO BE INVOLVED	• Entities managing waste, including specific flows: support in implementing and financing the guidelines; • Municipalities or urban waste management systems: collaboration to develop guidelines, providing and promoting a network of infrastructures for developing local actions; • State agencies for environment, economy, education: assistance with establishing collaborative networks; • Distribution and EPR companies: collaboration to provide and promote a network of infrastructures for developing local actions; • Industrial/business associations for products covered by extended producer responsibility, local trade associations, publishers and printers: boost range of solutions, participate in dissemination and communication; • Consumers' rights associations: raising consumer awareness;
GUIDELINES	**Product** • Develop partnerships involving national R&D, e.g. in design, to analyse products with a view to boosting manufacturing innovation (linked to Action 7); • Interact with manufacturers to develop strategies to extend product working life: e.g. servitization, "designing to last", component and service repair/remanufacturing; • Assess the introduction of differentiated financial allocations (eco-value, in short), awarding the introduction of circular requirements into products (e.g. eco-labelling, consumer information on the period of availability of spare parts and repair services, information on repairs by independent bodies or repair manuals for the final consumer, software or product update options, product return incentives, easy repair design) (linked to Action 2); • Cut the maximum size of family packs across the board (to be agreed with sugary drink producers and distributors), from a self-regulatory standpoint; **Consumer (linked to Action 3)** • Encourage repair & reuse: support development of a network of repair facilities, e.g. by backing initiatives promoted by councils, such as repair cafés, local swap shops and repairer banks, encouraging local and/or traditional repair activities (linked to the Environment Fund, regional agendas – circular cities); • Establish partnerships with municipalities to train and disseminate repair and reuse networks – resale, social support; • Develop tools to communicate to consumers the benefits of extending the useful life of goods/equipment, e.g. information on warranties, repair instructions, replacement parts, eco-labelling (linked to Action 3); • Develop banks of reused school books in the public network of educational establishments (linked to Action 3);

1. Design, Repair, Reuse: extended producer responsibility [product – consumption]

LEVEL OF PROGRESS	• Environmental Fund supporting local initiatives for reduce, reuse, repair – in progress)
SDG/EU/PT	• SDG 12.5: by 2030, substantially reduce waste generation through prevention, reduction, recycling and reuse; • National targets for prevention, reuse and recycling of specific flows (National Waste Management Plan (PNGR), Strategic Plan for Urban Waste (PERSU 2020)).
COMPLEMENTARY INDICATORS	• Ratio of shops offering repair services to total number of shops; • Repair cafés and/or local actions realised; • No. of users of the services made available; • Ratio of products repaired to new products sold (including reused vs. new school books) • Saving per student on the price of a basket of school books for each school year; • No. of partnerships with municipalities/distribution; • No. of awareness-raising actions and their respective impact.
REFERENCES	• Waste Framework Directive (Directive No. 2008/98/EC of the European Parliament and of the Council of 19 November); • General Waste Management Regime (RGGR) (Decree Law No. 178/2006 of 5 September); • Legislation related to specific referenced waste flows; • Ministerial Council Resolution No. 11-C/2015 (PNGR 2014-2020); • Ministerial order No. 187-A/2014 approving PERSU 2020.

example

Image: Lindsey Wuisan

Repair cafe| in repairing there is gain (portuguese proverb)

"Last Saturday different problems arrived at the FabLab, such as bicycle wheels, dying calculators, sweaters with holes, stubborn toasters (of those who do not want to catch the slice of bread) and even a tablet with the mini-usb input strangely inactive.

Our tireless volunteers have not been able to solve all problems but, for example, the calculator went home fully functional, even though the manufacturer itself declared it was a lost cause to begin with!"

Repair Café Lisboa

27/3/2017

When there is a malfunction in our equipments or goods it has become normal to hear the expression "it is cheaper to buy new than to repair".

Warranties cover replacement and / or repair for up to two years after purchase. But after this period it has become normal to prefer buying new instead of having it repaired: either because of lack of knowledge of repair options (e.g. instruction books), because it is more expensive or because there is a lack of such services.

The Repair Café movement emerged in 2009 as a meeting point, where citizens bring broken appliances or other items with minor damages to be repaired free of charge in a social, informal and collaborative environment. The tools and materials are made available by the organizers and consumers are invited to learn how to repair.

Today, there are more than 1,000 repair cafes around the world, repairing about 20 000 items a month, and playing an important social and educational role.

In Portugal, there are already some initiatives that have been gaining prominence. In Lisbon, the Circular Economy Portugal platform in collaboration with FabLab Lisboa and volunteers from AltLab and ReFaz, have been organizing Repair Cafes on a regular basis, including one dedicated to textiles, "Re: Sewing", which, in addition to enabling arrangement of articles of clothing, it also enables an upcycling with the help of designers and seamstresses.

At the University of Aveiro, students of the Department of Electronics, Telecommunications and Informatics (DETI) developed the ShareToy project that collects toys with electronic components, good or damaged, to be repaired and donated to social solidarity institutions.

And this is a movement that more and more Member States support, for example through tax incentives - Sweden has introduced a VAT reduction on repairs to goods such as bicycles, clothing and footwear, and IRS deductions of half the costs of appliance repairs such as refrigerators, ovens, dishwashers and clothes.

The main objective is the reduction of new materials and the energy to produce them, but they also hope to encourage an economic sector - that of repair - that was in decline and stimulate the creation of specialized technical jobs.

https://www.circulareconomy.pt/ | |https://uaonline.ua.pt

2. Incentivising a circular market [product – consumption]

GOALS	• To analyse the economic and environmental potential of gradually introducing instruments that subsidise sustainable production and consumption; • To incentivise the financial sector to seize investment opportunities in the circular economy; • To promote the productive sector's adoption of the principles of circularity.
KEY SECTORS	• Transversal; • Focus: construction, distribution and retail, plastics.
ROLES OR ENTITIES TO BE INVOLVED	• Entities designated by the ministers responsible for finance, jobs and environment: joint analysis of tax instruments to penalise the unsustainable use of resources; avoidance of lock-ins that hinder a more eco(nomic) and eco(logical) tax system; • Entities designated by the ministers responsible for finance, planning, economy and environment: business incentives (e.g. "Circular Economy Voucher") and awareness raising in the commercial and investment banking sector; • Commercial and investment banking sector: collaborate to seize investment opportunities in the circular economy, such as green bonds; • State agencies for innovation, business, research and environment: develop subsidy criteria for companies under SIFIDE program (extension of incentives on eco-design), to products or services obtained from certified R&D activities under SIFIDE; • Industrial associations: identify solutions in promoting aware and circular consumption.

GUIDELINES	Financial and investment sector
	• Promote the creation of a network to finance solutions (products, services) that speed up the transition to a circular economy, namely with international institutions;
	• Promote interaction between financial managers on investing in "circularity" and the benefits: e.g. green bonds (linked to Action 3);
	• Mobilise the investment community (e.g. via a circular agreement) to analyse investment mechanisms and tax subsidy systems for circular businesses.
	Taxation
	• Promote analysis of the impact of transition from taxes on work (a renewable resource) to raw materials (non-renewable) in Portugal;
	• Assess tax incentives associated with reducing consumption of plastic bags and consider their application to other disposable plastic-based products (of fossil-fuel origin);
	• Analyse barriers to adopting accredited certification that promotes efficient resource use (e.g. EMAS, ISO, eco-labelling) with a view to its promotion;
	• Analyse the introduction of consumer and/or business subsidies (VAT, income tax, corporate tax) for:
	  • Labour-intensive repair services, sale of second-hand products;
	  • Accredited ISO-certified organisations under the Portuguese Quality System (SPQ) or registered on EMAS;
	  • Products with accredited certification or eco-labelling (e.g. environmental labels, cradle-to-cradle design);
	  • Companies with circular business models (e.g. product-to-service).
	• Review tax instruments that incentivise or discourage circularity – i.e. that enhance consumption of non-renewable raw materials, amongst others;
	• Analyse the broadening of the Sê-lo verde (Go Green) award associated with products and companies that stand out for their integration of circular economy principles (linked with Action 1, 5 and 6);
	• Analyse the further development of the e-invoice system to cut the paper waste associated with issuing consumers with invoices.

2. Incentivising a circular market [product – consumption]

LEVEL OF PROGRESS	• Interaction initiated with the banking sector – ECO.NOMIA workshop; • Interaction with the EIB.
SDG/EU/PT	• SDG 8.4: Decouple economic growth from environmental degradation; • SDG 9.3: Increase the access by SMEs and micro-companies to financial services; • SDG 12: Sustainable consumption and production; • SDG 15.2, 15.3, 15.9, 15.10: Protect life on land; • EU: Action plan, circular economy financing platform.
COMPLEMENTARY INDICATORS	• Impact of the tax benefit awarded; • GVA generated; • Number of companies or products with tax benefits; • Amount invested in circular economy projects.
REFERENCES	• Groothuis, F et al., 2016, *New era. New plan. Europe. A fiscal strategy for an inclusive, circular economy*, Trucost, ExTax, Cambridge Economics, available at: http://www.neweranewplan.com/wp-content/uploads/2016/12/New-Era-New-Plan-Europe-Extax-Report-DEF.compressed.pdf ; • EU High Level Expert Group in Sustainable Finance, 2017, *Financing a Sustainable European Economy*, available at: https://ec.europa.eu/info/sites/info/files/170713-sustainable-finance-report_en.pdf .

example

Banks| circular economy as an investment

"Our vision is that the banking system should contribute to the growth of the circular economy, providing privileged conditions to projects that guarantee its principles.

Credit risk analysts should incorporate into their analysis models the concern to ensure compliance with rules related to the principles of circularization.

The principles of circular economy should be present in bank risk management and make them a lever for the growth of good credit portfolios. "

Dr. Licínio Pina, president of the administration council of Caixa Central Crédito Agrícola Mútuo

In Público, 19/2/2017

Financing is the main obstacle to the transformation of linear business models to circulars. However, as pointed out by the European Investment Bank, the linear economy carries significant risks which, in the overwhelming majority of cases, are not internalized in the financial analyzes.

Business models that rely on a circular economy maximize the value and usefulness of assets, materials, and products, reduce losses along the value chain, and may consider a residual as an asset rather than a liability.

But for banks and in the immediate future, the risks presented to these businesses are investment deterrents: promoters with few physical or collateral assets, innovative and non-commercially tested technologies, commercial risks for untested models, yet insufficiently developed by reusable, recyclable or by-product based products.

Therefore, it is necessary a new awareness for companies and banking. Long-term risks and the externalities associated with investment (erosion of natural capital) need to be considered.

In Portugal there is now a fundamental movement, led by some organizations such as the Central Mutual Agricultural Credit Fund, or the Working Group on Sustainable Finance of the Business Council for Sustainable Development (BCSD-Portugal), which brings together companies and banks around the development of measures and financial mechanisms to support business models that accelerate a circular, low carbon and green economy.

Faced with an opportunity for the European space of € 600 billion / year in savings in industry by 2025, and with a multiplier effect of € 1.8 billion / year, this is the moment for the agents of the Portuguese financial system to have a proper understanding of these opportunities and take a leading position.

The starting point will certainly be in the formation and discussion of the issue especially for the banks and insurers, and progress in the linear risk assessments of the investment portfolio.

http://www.bcsdportugal.org/grupos-trabalho/sf | https://institute.eib.org/

3. Educating for a circular economy [consumption - knowledge]

GOALS	• To establish a collaborative, strategic and cohesive commitment to build environmental literacy in Portugal via the National Environmental Education Strategy (ENEA), with circular economy as one of its cornerstones; • To educate the population to make environmentally aware choices of goods and services; • To raise social awareness of the consequences for the state of the oceans of choosing goods and services that ignore the environmental impacts;
KEY SECTORS	• Transversal; • Focus; central and local government, associations, foundations, companies, educational establishments (higher and non-higher), environmental education facilities, NGOs.
ROLES OR ENTITIES TO BE INVOLVED	• Entities designated by the ministers responsible for local authorities, science, education, jobs, economy and environment: monitoring and implementation of ENEA 2020; • State agency for business: academia and SMEs; • Experts (academia, business sector, state agencies for education, employment, consumer, maritime policy): facilitate the development of curricula aimed at a systemic approach, and transversal inclusion of circularity principles in courses; • Municipalities: collaboration on developing local actions; • Companies (communication, trainers): interaction to develop communication campaigns, consumer-oriented actions (linked to Action 1, Action 4, sectoral agendas)..
GUIDELINES	Innovation • Support for national competitions on circular business ideas (linked to sectoral agendas, Action 1, Action 4); • Solutions to challenges related to extending the useful life of resources developed by citizens and applied at the local level (e.g. parish councils) (linked to the Environment Fund, regional agenda – circular cities); Knowledge • Bolster academic curricula and educational methods transversally: inclusion of circular economy principles to complement subjects with a more systemic approach (e.g. industrial ecology) (linked to Action 7); • Enhance the ECO.NOMIA portal with a communication structure that can convey this concept to different audiences using robust examples; • Promote the training of people who can intervene at the public policy level and during its implementation regarding concepts of sustainable development, circularity and the need to promote reduced consumption and natural resource extraction, as well as the importance of innovation; • Promote the integration of circular economy principles in the training of actors (teachers, senior and middle management, company employees, business and financial sector technicians, public administration) and also in the context of qualifications included in the National Qualifications Catalogue (linked to sectoral agendas); People • Promote communication campaigns enabling behavioural changes to reduce waste and maintain goods and services, also in the context of the National Strategy for Citizenship and Environmental Education Benchmarking for Sustainability (ENCREAS) and other strategies like ENCDA or the Integrated Strategy to Promote Healthy Eating (EIPAS) (linked to Action 1 and 4); • Promote awareness campaigns on the consequences to the state of the oceans of choosing goods and services that ignore environmental impacts; • Support environmental educational programmes and activities aimed at the circular economy, environmental literacy and ocean literacy by, chiefly, drawing up Municipal Environmental Education Programmes that include actions to be taken, goals and targets for different target groups; • Promote national and/or international initiatives for reflection and debate; • Support and promote programmes and actions to incentivise the reuse of school books (linked to Action 1).

3. Educating for a circular economy [consumption - knowledge]

LEVEL OF PROGRESS	• Approval of the ENEA – Ministerial Council Resolution No. 100/2017 of 11 July; • ECO.NOMIA workshops: four sessions held in 2017; • Dissemination of the APCE: 3 sessions held in 2017; • Examples on the ECO.NOMIA portal: 165.
SDG/EU/PT	• SDG 4: Quality education; • SDG 12: Sustainable consumption and production; • SDG 15.2,15.3,15.9,15.10: Protect life on land.
COMPLEMENTARY INDICATORS	• The assessment and monitoring system will be developed during the course of implementing ENEA 2020.
REFERENCES	• Ministerial Council Resolution No. 100/2017 of 11 July

4. Eat without waste: sustainable production for sustainable consumption [consumption – waste, by-products, secondary raw materials]

GOALS	• To understand and monitor the national food waste situation in the value chain; • To reduce the production of organic waste and raise productivity in the value chain, chiefly in sectors linked to the food industry, contributing to natural resource conservation; • To contribute to educating the producer/consumer.
KEY SECTORS	• Agricultural and agribusiness production; Fisheries, aquaculture and fishing industry; • Distribution and retail; HORECA channel; • Municipalities; Civil society and the consumer;
ROLES OR ENTITIES TO BE INVOLVED	• National Commission to Fight Food Waste (CNCDA) (10 government areas, 2 local government associations and voluntary organisations): consider the inclusion of APCE guidelines to complement actions undertaken under the National Strategy to Fight Food Waste (ENCDA) and respective action plan (PACDA): • Entities designated by ministers for the economy, environment, agriculture, forestry and rural development and maritime affairs: support to boost the knowledge network for key projects – see sectoral and regional agendas; development of economic incentive instruments; • State agencies for business, maritime affairs: ensure links to the agribusiness sector, ensure coordination and guiding strategies for circular maritime economy; • Directorate General of Food and Veterinary Medicine (DGAV): capitalise on Portuguese participation in the EU Platform on Food Losses and Food Waste (FLW); • DGPM: ensure coordination and support initiatives aligned with the guiding strategies of the circular maritime economy, as agreed to by the minister responsible for maritime affairs; • Industrial associations, consumer protection, producer/fisher organisations, regional agencies, municipalities, companies: promote producer/consumer education – e.g. through the wholesale fish market proof of purchase (CCL);interaction to develop collaboration in developing activities, identification of barriers to the use of value chain by-products (e.g. via circular agreements);
GUIDELINES	• ENDCA and PACDA: support actions under the strategy and action plan to fight food waste in its myriad forms, with consumer- and producer-related measures bolstered in subsequent points, namely the prevention and communication tools (e.g. e-platform for the interactive management of food products at risk of waste, local production/distribution/consumption networks), and measures to reduce waste across the whole value chain; Consumer • Propose information campaigns, involving the production sectors, distribution/retail, on the significance of expiry labels (linked to Action 3); • Support the development or testing of solutions oriented towards reduction of food waste in urban areas, boosted, for example, by parish councils and/or municipalities with measurement of economic and environmental impacts, making use of new technologies and collaborative platforms and proximity production/consumption systems (linked to the Environment Fund and Action 6); • Propose “zero waste” areas or incentives in retail: e.g. centralisation of bulk goods in “non-standard” formats at the end of their expiry date, and subsidies via accumulation of “points on the store card” (linked to sectoral agenda – distribution and retail); • Ensure measures linked to other strategies competing to achieve the goal, such as EIPAS. Waste, by-products and secondary raw materials • Analysis of legal obstacles to the cascading use of value chain by-products, reuse, upcycling (linked to Action 5, regional agendas – industrial symbioses, circulars cities); • Review of legislation associated with donating food products, in connection with European guidelines - C(2017) 6872 final (linked to Action 2).

4. Eat without waste: sustainable production for sustainable consumption [consumption – waste, by-products, secondary raw materials]

LEVEL OF PROGRESS	• Public consultation on ENCDA closed 29 September 2017; • ENCDA and PACDA submitted to the minister responsible and presented publicly on 8 November 2017.
SDG/EU/PT	• SDG 12.3 – Halve per capita food waste along production and supply chains; • SDG 14.1 – Protect marine life/regulate marine resources extraction; • SDG 14.2 – Protect marine life/sustainably manage and protect marine ecosystems; • EU: circular economy action plan, key area: food waste.
COMPLEMENTARY INDICATORS	• Those considered via ENCDA and the respective action plan.
REFERENCES	• Order No. 14202-B/2016, published in the DR, 2nd series, No. 227 of 25 November 2016; • Resolution of the Assembly of the Republic No. 13/2017 of 6 February; • CNCDA, 2017, Fighting food waste: a responsibility from producer to consumer, available at: http://www.gpp.pt/images/MaisGPP/Iniciativas/CNCDA/ENCDA_consulta-publica.pdf • COM (2017) 6872 final – *Commission notice: EU guidelines on food donation*.

Image credits: CoolFarm

CoolFarm | local, eficient, vertical production

"The eradication of food waste through the design of more efficient circular food systems in cities, where more than half the world's population lives, is not only an environmental but also a moral imperative"

Jack Barrie, Ellen MacArthur Foundation

The Recipe for Urban Circular Food Systems, progrss (blog) 2017

Production and food consumption account for between 19% and 29% of global GHG emissions - more than emissions from the energy sector or transport.

In order to feed 9 billion people by 2050 it will be necessary to increase food production by about 70% compared to current levels. Being that 2/3 of the population will focus on cities.

Vertical agriculture crosses known agricultural practices - hydroponics, aeroponics - with industry 4.0, bringing a solution with multiple advantages, especially in urban centers.

It reduces the pressure on soil occupation, avoids the intensive use of water and fertilizers (precision agriculture), reducing energy intensity (less cooling / transport requirements), allowing industrial symbioses (eg fish production in aquaculture), reducing the need for packaging, stimulating local production and consumption. And it is, therefore, an important piece in the acceleration of the circular economy, especially in urban centers.

The Portuguese company CoolFarm was born in Coimbra in 2014, through entrepreneurs Eduardo Esteves, João Igor, Liliana Marques and Gonçalo Cabrita.

First, they developed "the Eye" and "in / control", an intelligent control system for greenhouses and agricultural production warehouses, which monitors all growth parameters and allows to grow crops in the most healthy, effective and efficient way possible through analytical capacity based on artificial intelligence.

Recently, they have developed the "CoolFarm In / store", an automatic closed and vertical system that allows to cultivate vegetables of superior quality, all the year. Customizable and composed of modules that start in the 100 square meters of production area, it uses 90% less water than the traditional route and requires no pesticides or herbicides.

https://www.cool-farm.com/

5. A new life for waste! [waste, by-products, secondary raw materials]

GOALS	• To increase the introduction of secondary raw materials into the economy; • To reduce waste production and context costs for companies; • To reduce the need for natural resource extraction.
KEY SECTORS	• Sectors with best available techniques (BATs): power plants and refineries, metals production and processing, minerals and the chemical, pulp and paper, wood and agglomerate, surface treatment with organic solvents and agribusiness industries.
ROLES OR ENTITIES TO BE INVOLVED	• Entities designated by the minister for the environment: propose measures for legislative amendments to the general waste management regime; • Entity designated by the minister for the economy: propose development of agenda to classify products, declassify waste and develop derived products under the FITEC/INTERFACE programme; • Entity designated by the minister for foreign affairs: support to promote international mechanisms for "circular agreements"; • State agencies for business, energy & resources: knowledge and support for critical raw materials (mapping), partnerships with entities in the R&I system (linked to Action 7); • State agency for environment, agriculture: monitoring process for by-product classification; • Waste management operators: participation under international "circular agreements"; Public and private bodies related to the dismantling and recycling of ships; • Collaborative laboratories (CoLaB) oriented towards the circular economy, technology centres: accredited technical expertise to classify, set quality parameters and share knowledge; • Competitiveness clusters, associations: promote critical materials mapping per sector and knowledge sharing.
GUIDELINES	Regulatory • Review the classification process, namely fees, decision-making deadlines, classification conditions for by-product, simplified mechanisms (when in MTD) and operator accountability; • Digitise, simplify and streamline by-product classification requests under the single environmental licensing (LUA) system; • Develop an information registration system to monitor the classification process available to players (e.g. SIMPLEX association, LUA module); • Work with international public authorities to establish "circular agreements" for acceptance of by-product and materials with end-of-waste status where declassified in Portugal; Innovation • Promotion of experimentation and innovation areas to test the use of by-product (linked to the Responsible Business Hubs (RBHs) regional agenda; • Promote needs mapping (critical materials, replacement options) and sharing of good practices by sector to harness the multiplied use of by-product and materials with end-of-waste status (linked to Action 7); • Propose development of an agenda to classify by-product and develop derived products under the FITEC/INTERFACE programme (also linked to Action 7, construction sectoral agenda); • Promote the rationalisation and specialisation of construction sites and shipyards to suit the present and future needs of the maritime economy, contributing to promote green maritime activities, namely via repair and dismantling, cutting emissions and promoting materials recycling.

5. A new life for waste! [waste, by-products, secondary raw materials]

LEVEL OF PROGRESS	-
SDG/EU/PT	• SDG 12.2: by 2030, achieve the sustainable management and efficient use of natural resources; • SDG 12.5: by 2030, substantially reduce waste generation through prevention, reduction, recycling and reuse; • EU: circular economy action plan – waste and secondary raw materials.
COMPLEMENTARY INDICATORS	• No. of new types of waste classified as byproducts and with end-of-waste status; • Average time to process a byproduct classification decision; • No. of agreements established and countries covered.
REFERENCES	• Waste Framework Directive (Directive No. 2008/98/EC of the European Parliament and of the Council of 19 November); • RGGR (Decree Law No. 178/2006 of 5 September); • Ministerial Council Resolution No. 11-C/2015 (National Waste Management Plan 2014-2020); • Implementing Order No. 187-A/2014 approving PERSU 2020; • National Maritime Strategy 2013-2020 (ENM) (updated January 2015).

CORK| in the heart of circular economy

"Cork is like a foam from Nature with a unique combination of properties."

NASA

"In addition to having a less wasteful extraction process and great versatility in its applications, the cork is biodegradable, easy to reuse and is tough enough to circulate repeatedly in the economy"

CIRCULATE by Ellen MacArthur Foundation

9/6/2015

Portugal has the world's largest area of cork oak forest (34%) and holds 49.6% of the world's production of this material.

As a world leader in this industry, the portuguese company Amorim makes this material viable in a unique way and promotes the preservation of cork oak trees, an inimitable example of the green economy and the virtuous balance between economy, society and the environment.

The constant concern to adopt and reinforce practices of sustainable development places Amorim as an example of sustainability.

The "montado" is the basis of one of the 36 most important biodiversity habitats, housing more than 200 species of endemic animals and 135 types of plants/1000 m2. The CO2 absorption capacity can reach 32 M tonnes / year.

In this sector, Lavoisier's maxim is completely followed: nothing is lost, everything is transformed. 100% of the cork used by Amorim is used, without generating waste.

The properties of cork make it an ideal material for the replacement of other non-renewable materials, some of which have toxic components, in an increasing number of applications.

From the aerospace and aeronautics sector to the automobile, construction components, textiles and footwear, coatings and insulation, furniture, consumer goods, the finitude of applications of this material has yet to be discovered.

The low environmental impact extraction process, a 0% wasteful production process, promoting synergies with other materials and by-products (e.g. plastic, rubber) and also the collection of used cork stoppers (Green Cork project) makes Amorim a unique example in circular economy.

One can say that it sits at the center of the technical and biological cycles of the circular economy model as formulated by the Ellen MacArthur Foundation.

http://www.amorim.com

6. Regenerating resources: water and nutrients [consumption - waste, by-products, secondary raw materials]

GOALS	• To impove water efficiency; • To increase water reuse; • To improve the recirculation of nutrients and organic matter through their natural cycles.
KEY SECTORS	• Agricultural and agribusiness production, forestry, livestock, maritime industries, chemical industry, manufacturing industry, water and sanitation (urban cycle, tourism cycle), waste;
ROLES OR ENTITIES TO BE INVOLVED	• Entities designated by the minister for the environment: propose measures for legislative amendments aimed at ensuring the development of the activities proposed; • Entities designated by the minister for local government, economy, environment and agriculture and forestry: propose measures to consolidate the national approach to the bio-economy; • State agencies for business, environment, water, agriculture, energy, innovation and health: develop and monitor activities, promote measures, namely in the livestock sector, with a view to pursuing the goals of this action with due safeguarding of natural resources; draw up requirements for the system of labelling and accredited certification of water efficiency and use of treated wastewater; operate research and innovation (R&I) programmes for efficient water use and efficient nutrient use; monitoring and safeguarding of public health protection; • Portuguese Water Partnership (PPA), Portuguese Soil Partnership (PPS): monitoring activities; • Water resource planners, river basin managers and water sector managers, irrigator associations, etc: application of guidance documents with due safeguards; • Industry associations: support and participation in developing actions planned for the industrial sector.
GUIDELINES	Use and consumption • Promote water efficiency in the urban sector (residential and service buildings), agriculture and industrial sector: e.g. simplified water efficiency guides of the best techniques available for the various sectors, water efficiency training and development of tools to support accounting and management of consumption (e.g. water calculator); • Develop water efficiency labelling and accredited certification; • Establish goals per river basin region for a more effective ratio of volume captured to volume used with sustainability targets; Reuse • Promote integration of water reuse in the planning and management of water resources as per the “Guidelines on Integrating Water Reuse into Water Planning and Management in the context of the WFD”, with adoption of best practices and support for innovation and investment, promoting public health and environmental protection; • Support the development of synergies and/or technologies for obtaining minimum reuse requirements (linked to Action 7, regional agendas); • Propose awareness campaigns for water reuse involving the main stakeholders (linked to Action 3); Regeneration • Work on promoting biotechnologies for extracting and reusing nutrients and compost, favouring the hierarchy of waste material use and the added value (economic and environmental) of the derived product, e.g. the bio-refining of industrial/domestic effluents to extract phosphorus/nitrogen, produce compost and/or produce organic fertilisers and bio-energy from livestock effluents; • Promote voluntary agreements to overcome obstacles to promote water reuse, use of extracted materials and production/use of compost as fertiliser; • Promote organic agriculture and sustainable agricultural practices as a vehicle for speeding up the regeneration of nutrients and efficient water use.

6. Regenerating resources: water and nutrients [consumption - waste, by-products, secondary raw materials]

LEVEL OF PROGRESS	• Approval of the National Organic Farming Strategy (ENAB) (Ministerial Council Resolution No. 110/2017 of 27 July).
SDG/EU/PT	• SDG 6.4: Sustainable management of drinking water and sanitation for all; • SDG 12.2: by 2030, achieve the sustainable management and efficient use of natural resources; • ODS 14.2 – Protect marine life/manage and protect marine ecosystems sustainably; • EU: Action Plan for the Circular Economy, water reuse, bio-economy plan; • PT: PNUEA: 15% industry; 35% agriculture; 20% urban (national), PENSAAR 2020 targets.
COMPLEMENTARY INDICATORS	• No. of actions taken to disseminate the guidance document; • No. of directives adopted; • No. of awareness actions and their respective impact.
REFERENCES	• Water Framework Directive (Directive No. 2000/60/EC of the European Parliament and of the Council of 23 October 2000); • Ministerial Council Resolution No. 113/2005 of 6 June approving PNUEA; • Water Law (Law No. 58/2005 of 29 December); • CIS – “Common implementation strategy for the Water Framework Directive and the Floods Directive (2016). Guidelines on Integrating Water Reuse into Water Planning and Management in the context of the WFD"; • Decree Law No. 276/2009 of 2 October – harnessing the agricultural value of sludge from WDPs; • Implementing Order No. 631/2009 of 9 June on management of livestock effluents; • European Commission (2012). “Innovating for Sustainable Growth: a Bio-economy for Europe” (under revision).

7. Researching and innovating for a circular economy [knowledge]

GOALS	• To define key research and innovation areas for speeding up the circular economy in Portugal; • To define, develop and enhance expertise in the areas identified; • To identify and enhance circular economy knowledge networks.
KEY SECTORS	• Transversal, with a focus on R&I in: design and development of new products, processes and services (new or improved); sustainable management of resource cycles, governance and circular territories, new business models, behaviour and consumption.
ROLES OR ENTITIES TO BE INVOLVED	• Entities designated by the minister for science and technology: development of the R&I agenda and its use in international decision-making and as a means of identifying challenges and opportunities for Portugal in R&I in the circular economy; • Experts (academia, business sector, public sector): develop the content of the agenda based on a bottom-up approach associated with their experience and expertise in promoting and implementing efficient and productive use of resources; • Entities designated by the ministers for the economy, environment, agriculture, forestry, and rural development and maritime affairs: appropriation of the R&I agendas as guidelines for defining support policies; • State agencies for environment, business and innovation: provide support to the network of the R&I community, support projects to accelerate circular economy.
GUIDELINES	• Definition of the long-term R&I agenda (up to 2030), via a consultative process involving experts from various areas of the domestic economic system, e.g. higher education institutions, research centres, technology centres, businesses; • Presentation and dissemination of the R&I agenda with a view to identifying bridges between current policies and those under development that might bolster the agenda's goals, as well as workshops for public discussion; • Mapping and promotion of circular economy R&I projects based on the analysis and survey of projects funded via FCT, Horizon 2020, LIFE programme, the ECO.NOMIA portal, Portugal 2020, tax credit beneficiaries under SIFIDE, and supported via the Environmental Fund and FITEC (linked to Action 3); • Boosting of the circular economy R&I sector to spread the goals of the agenda and APCE: • Promote R&I integration to develop solutions to challenges identified in APCE actions (e.g. eco-design and repair, short production and consumption loops, secondary raw materials, water resource regeneration, etc.) (linked to Action 1, 4 and 6); • Promote interaction with circular-economy-oriented CoLabs and tech centres to support development of methodologies and criteria associated with industrial subproducts (linked to Action 5) • Support development of expertise and solutions in an intersectoral and regional context (linked to the sectoral and regional agendas); • Promote knowledge transfer between entities (e.g. creation of collaborative spaces for sharing knowledge between academia and business) – (linked to Action 3).

7. Researching and innovating for a circular economy [knowledge]

LEVEL OF PROGRESS	• Research and Innovation Agenda is under development (agenda horizon – 2030).
SDG/EU/PT	• SDG 8.2: Higher productivity through innovation; • SDG 9: Industry, innovation and infrastructure; • SDG 12.2, 12.5, 12.6: Innovation for resource productivity and sustainability in companies; • SDG 14.2, 14.8: Protecting marine life; • SDG15.2, 15.3, 15.9, 15.10: Protecting life on land; • EU: alignment with innovation, investment and monitoring in the Circular Economy package.
COMPLEMENTARY INDICATORS	• No. of actions to divulge the guidance document; • No. of directives adopted; • No. of awareness actions and their respective impact; • No. and investment in circular-economy-related R&I projects; • No. of PhD and post-PhD grants and contracts in scientific employment.
REFERENCES	• Commitment to Knowledge and Science: Commitment to the Future (Ministerial Council Resolution No. 32/2016 of 3 June); • National Reform Programme: innovation in the Portuguese economy; • European Commission, 2017, *Industrial policy strategy: investing in a smart, innovative and sustainable industry*. Available at: http://ec.europa.eu/growth/content/state-union-2017-%E2%80%93-industrial-policy-strategy-investing-smart-innovative-and-sustainable_en

example

Image credits: Público

BLC3 | science accelerating the circular economy

"We have proven that technologies and knowledge transform problems and opportunities into new businesses, into a competitive local economy with low environmental impact and high levels of economic efficiency, thus creating an industrial and regional symbiosis."

João Nunes, BLC3

Regiostars Awards, European Commission – DG Regio, 2016

In the forests of central Portugal, there is a revolution happening. A technology and innovation center is developing a biologically based rural economy that uses local resources sustainably, creating new business, employment, limiting imports of materials and preserving the region's natural ecosystem.

Inspired by agricultural and forestry residues that raised fire risks in the region but had potential to interact with different value chains, BLC3 - Bio Center: Bio-industries, Biorefineries and Bioproducts, works with researchers, local farmers, forest producers and entrepreneurs to develop new businesses from these biologically based by-products.

The BLC3 wants to accelerate the development of industrial symbioses among different companies in the region, where managers interact and share resources to minimize the need for raw materials and waste generation.

The "star" project is a biorefinery for the production of 2nd and 3rd generation biofuels, which use local bio waste, not competing with the food or wood sector.

But the center hosts more projects that use the potential of local resources and by-products, some of them unused as fungi and fruits, effluents from cheese production, ashes and organic waste to recover degraded soils.

The expansion of this network to other regions - such as the North and Alentejo - creating a "Smart bio-region" can lead to € 2.9 - € 3.4 million in annual income and more than 70,000 jobs.

The BLC3 represents a public-private investment of € 9.2 M, has already won three awards of excellence, has given impetus to the creation of 24 R & D subprojects, saw the creation of 4 spin-offs and 6 new companies, attracting a investment of € 125 M for the biorefinery project (via EIB) - subject to completion of the 2nd Phase of the pilot.

It also supported the creation of the All - Portuguese Association of Bio - Economics and Circular Economy, linking society and stakeholders, as well as the creation of 38 projects of academic entrepreneurship involving 2360 young people.

http://www.blc3.pt | http://www.bioec.pt/

Meso action: sectoral agendas

Secretary of State for Tourism Deputy Secretary of State for Trade State agencies for tourism, environment, natural parks, economic activities Hotel, restaurant and tourism associations Institutions of higher education	Secretary of State for Industry State agencies for business Technological centers Institutions of higher education Business associations Creatives	Secretary of State for Trade Secretary of State for Environment Secretary of State for Agriculture and Food State agencies business, environment Institutions of research and higher education Industry associations (logistics, retail) Resource management bodies
Analysis of critical material flows, water typology Short production/ distribution/consumption chains, sharing networks Digitisation potential, enhancement of "empty" spaces, recycled materials use, reuse Promotion of eco-labelling/EMAS Good practices and criteria guides	Direct digital production potential (3D printing) – digitisation, zero waste production Potential to apply biomaterials, symbioses with other by-products (e.g. rubber, textiles), yarn recycling Products designed to repair, remanufacture + take-back & reuse systems	Mapping of resource flows, e.g. use of plastics in the value chain – packaging, including bags Test for innovative packaging solutions (e.g. biomaterials, design) Synergies between deposit systems (e.g. containers), packaging and online deliveries, reuse Green and sustainable purchasing (incentives)
Sustainability as a an international selling point	**Adding material efficiency to the value chain – design, product, service**	**Less waste, more value, better consumption**
TOURISM	TEXTILES AND FOOTWEAR	RETAIL & LOGISTICS

The definition of sectoral agendas is based on an analysis conducted by the inter-ministerial group on the Portuguese economic context to identify key sectors – that are materials intensive, export-oriented and have a significant consumer impact – for speeding up the circular economy. However, it is likely that with the consolidation of the APCE Coordination Group's work and the involvement of the other entities, other sectors or intervention areas, such as maritime industries, energy, transport and logistics, manufacturing, etc., may be signalled. It is advisable that agendas of this kind are developed by all sectors and that, where possible, they are disseminated and discussed in the context of the platform suggested by the APCE.

The structure of the agendas must not be inflexible. It acts as a starting point for discussion between stakeholders to establish the conditions and actions and follow the evolution of knowledge in this matter (e.g. tools, services, new products, technologies).

Detailed in the APCE are proposed guidelines for 2 agendas in particular (construction and public procurement) as these are areas where conditions are coming together – policies, stakeholder involvement, investment – or some work already exists (e.g. ECOPOL Project on public eco-innovation policies) for debate on these matters to be introduced and actions mobilised in the short term. However, agenda suggestions for 3 other sectors are also put forward: tourism, textiles/footwear and distribution and retail. This structure could be seen as a first step in the call for "circular agreements" to address particular challenges.

Built environment: greater efficiency and material productivity

GOALS	• To increase the introduction of secondary raw materials into the economy; • To reduce waste production, demand for raw materials (primary) and water consumption; • To reduce GHG emissions;
KEY SECTORS	• Building material producers, developers (e.g. public bodies, municipalities, public enterprises), remodelling, demolition and building companies, planners, designers and architects; • Municipalities, built environment users; • Construction and demolition waste (CDW) management operators; • Distribution companies.
ROLES OR ENTITIES TO BE INVOLVED	• Entities designated by the minister for environment (urban rehabilitation, waste, land planning), planning and infrastructure, science and technology, economy: development of policy instruments, investment; • Municipalities and/or municipality associations: collaboration on local actions; • Public institutions focused on real estate, civil engineering: support to define circularity criteria in public works, technical rules for materials made from CDW; • Laboratories, higher education institutions and technology centres in the areas of architecture, design and construction (engineering and materials); • Industrial and technical associations, including competitiveness clusters, waste and real estate and real estate agents; • Companies: material producers, components, engineering and architecture offices.
GUIDELINES	Design • Rehabilitate and use: protocols to incentivise reuse of components, recovered or recycled materials, development and/or use of material passports, promotion of the use of "empty" built space (public and/or private); • Circular construction: public and private infrastructure such as projects that demonstrate the application of circular solutions (e.g. reuse of components, eco-labels, deconstruction guides, environmental product declarations, cradle-to-cradle design) Manufacture • Promotion of resource efficiency in the value chain: guides on good practices, efficient resource use plans, reverse logistics systems, segregation incentives, incentives for EMAS approach adoption; • Promotion of CDW incorporation into construction materials production: e.g. LNEC protocols; Reuse and recycling • Dissemination of the EU Construction & Demolition Waste Protocol and pilot projects for its implementation; • Reuse of building components: agreements between municipalities, companies and offices to: i) store components removed from demolition/rehabilitation projects; ii) create maintenance criteria; iii) catalogue and reference; iv) disseminate; • Review of legislation: e.g. RGGR, waste management fee for CDW, SILIAMB registration for licence renewals, building project plans, quality protocols, etc; Transversal • Positive discrimination for companies that establish voluntary agreements with the state on this matter;

Built environment: greater efficiency and material productivity

LEVEL OF PROGRESS	• EEA Grants – EEA Financial Mechanism with a thematic area for the Circular Economy – Construction (underway)
SDG/EU/PT	• SDG 9.4: Resilient infrastructure; promote inclusive and sustainable industrialisation and foster innovation; • SDG 12.2, 12.4-12.8: Sustainable consumption and production; • EU: Circular economy action plan: CDW; • PT: 70% target for preparing the reuse and recycling of waste;
COMPLEMENTARY INDICATORS	• No. of voluntary agreements signed and sectors covered; • No. of guides developed; • No. of reuse initiatives; • No. of quality protocols developed (materials from CDW); • No. of projects incorporating smart design; • Rate of compliance with the obligation to use at least 5% of recycled materials in construction contracts under the Public Contracts Code.
REFERENCES	• Waste Framework Directive (Directive No. 2008/98/EC of the European Parliament and of the Council of 19 November) and RGGR (Decree Law No. 178/2006 of 5 September); • Legal Regime for Urbanisation and Building Construction; • Public Contracts Code (Decree Law No. 18/2008 of 29 January).

example

Image credits: APRUPP

APRUPP | Material bank

"It would make sense to take full advantage of preexistent materials, which seldom happens.

Thus, there is a lot of materials that are being disposed of, at a time when this sector is also required to do its work to meet national waste targets "

Cláudia Cardoso – APRUPP

In Público,7/4/2017

Founded in 2012, the Portuguese Association for Urban Rehabilitation and Heritage Protection (APRUPP) is defined as a non-profit organization that seeks to promote and disseminate the concept of urban rehabilitation focused on its multiple dimensions: physical, economic, environmental, social and cultural development.

In this context, in February 2017, it launched the Repository of Materials, an online Cataloging of old / used Construction Materials, from demolition works, with potential for reuse. This pilot project aims to promote sustainable urban rehabilitation and the safeguarding and reuse of materials.

The platform is intended mainly for construction technicians, construction / demolition companies, town councils, landowners and other entities involved in urban rehabilitation, while at the same time promoting good practices of sustainable rehabilitation and sensitizing society for a resource economy and environmental protection, reducing waste.

For the time being, materials and components are removed from buildings and structures, cleaned and stored in places temporarily provided by companies associated with the project and members of APRUPP.

The platform is now waiting for funding to become more interactive and up-to-date on current availability: an interface between supply and local demand. And it has attracted interest from contractors and architects, who want to help it expand to other areas of the country, as well as the adhesion of small owners who, in their "home" works, come to deliver components to the Association, voluntarily.

The growth and expansion potential of this network is relevant when one considers the connection to other existing "material banks" - such as ceramic products - or future ones.

The articulation with municipalities - both for logistics and for the promotion of recirculation of these materials - is fundamental to capture the full value and benefits of this initiative.

Green and circular public procurement

GOALS	• To promote efficiency in the use of materials, materials value retention; • To reduce costs while boosting the market for innovative circular products and services (public procurement as a living lab for circular solutions); • To cut environmental impacts;
KEY SECTORS	• Direct and indirect administration and state enterprise sector; • Suppliers (e.g. through industrial and business associations).
ROLES OR ENTITIES TO BE INVOLVED	• Entities designated by the minister for environment: urban rehabilitation, waste, coordination of the working group for green public procurement; • Entities designated by the minister for planning and infrastructure: development and cohesion, infrastructure – construction, real estate, public contracts; • Entities designated by the minister for finance and health: services shared by the public administration; • Entities designated by the minister for work, solidarity and social security: shared services, accumulated experience; • Entities designated by the minister for science, technology and higher education, economy: involvement of industry and innovation systems, investment; • Competitions Authority, National Institute of Statistics (INE); • Businesses producing product-service-technology solutions to be tested; • Municipalities/municipality associations :collaboration on local actions;
GUIDELINES	• Support structure for collaborative development of solutions adopting circularity principles, their experimentation, and monitoring of environmental and economic impacts compared to traditional alternatives, involving players in the value chain (e.g. through a circular agreement); • In priority sectors – e.g. construction – anticipate opportunities, barriers and risks establishing criteria promoting circularity of the resources involved, e.g. at the time of benefitting from public funds; • Analyse the integration of criteria promoting resource circularity in the list of priority goods and services established in the context of the working groups of the National Strategy for Green Public Procurement (ENCPE 2020), developing checklists to assist the selection process; • Plan subsidies associated with products or services which incorporate these principles in the context of the CPE, e.g. accredited certification and eco-labelling, cradle-to-cradle design, voluntary agreements with suppliers to apply these principles; • Analyse extending these subsidies under SIFIDE, namely on R&D projects resulting from public procurement initiatives that are deemed as innovative, including innovation at the pre-commercial stage, in partnership with IMPIC; • Plan the collecting of information on the base portal to assess the introduction of these requirements and respective impacts, and partnership with INE to structure monitoring; • Interaction with the Public Contracting working group of the Green Growth Coalition to assess progress towards the transition; • Link the responsibility for monitoring ENCPE 2020 with the ENCPE 2020 Monitoring Group (GAM); • Divulge knowledge on successful/good practices in circular public procurement: Benchmarking Study on Circular Public Procurement by the Council of Ministers of Scandinavia (2017), GPP criteria for ICT, roads, European Commission office buildings (2016, 2017); • Development, interlinked with GAM ENCPE 2020, of training workshops for public entities, including municipalities and senior and middle management, on green and circular public procurement.

Green and circular public procurement

LEVEL OF PROGRESS	• National Strategy for Green Public Procurement (ENCPE) 2020;
SDG/EU/PT	• SDG 12: Sustainable consumption and production • EU: Action Plan: Public procurement • PT: Direct and indirect administration: 60% of pre-contractual public procedures to acquire goods and services and the respective financial amounts include environmental criteria; • State enterprise sector: 40% of pre-contractual public procedures to acquire goods and services and the respective financial amounts include environmental criteria;
COMPLEMENTARY INDICATORS	• No. of products/services covered by circularity criteria; • No. of good practices identified and disseminated; • Environmental and economic impact: reduced emissions, waste, costs vs. the traditional option.
REFERENCES	• National Strategy for Green Public Procurement 2020 (ENCPE 2020), approved by Ministerial Council Resolution No. 38/2016 of 29 July; • Order No. 2568/2017 – Implementation of ENCPE 2020; • European Commission, 2017, *Public procurement for a Circular Economy*. Available at: http://ec.europa.eu/environment/gpp/pdf/Public_procurement_circular_economy_brochure.pdf

Micro action: regional agendas

To understand how the circular economy is being approached by each region, information was requested from the CCDRs in continental Portugal on how they envision key sectors and projects for the circular economy in their region and what initiatives had been taken. The information submitted showed that there is room to foster more effective coordination, interaction and collaboration in promoting the circular economy through, for example, anchor projects on which multiple subsequent projects can be based.

The development of regional agendas must be a starting point for collaboration in this area, incentivising knowledge exchange, the creation of collaborative networks (business, scientific and others), joint projects and definition of coordinated investment mechanisms. For that reason, awareness-raising and the involvement of various stakeholders on the topics set out in the agendas must be addressed.

Four “anchor” areas are identified, i.e. national and regional convergence themes to accelerate the circular economy, that can be worked on jointly and which allow the socio-economic specificities of each region to be preserved. However, other anchors may be considered, such as ports and industrial and logistics areas, etc. These themes must be worked on with local entities (e.g. CIM, local authorities, community groups) not just to enrich the agenda by endowing it with a local aspect, but also as a means to incentivise the development and adaptation of guidelines at this level.

Each theme is interrelated to ensure greater efficiency in combining regulatory, economic and voluntary instruments oriented towards its implementation. In addition, and wherever possible, it is appropriate to link to other framing instruments such as the PNPOT, currently underway, the Sustainable Cities Strategy 2020 or the Strategy to Increase Port Competitiveness.

	INDUSTRIAL SYMBIOSIS	CIRCULAR CITIES	CIRCULAR BUSINESSES
	State agencies for innovation, environment, business Institutions of higher education, technology centres, polytechnics Regional, municipal, local authorities Business and industry associations	State agencies for innovation, environment, territory and mobility Institutions of higher education, businesses Regional, municipal, local authorities Projects: Leiria, Guimarães, Lisboa, Porto, Living Labs	State agencies for business, environment Institutes of higher education Regional, municipal, local authorities Business associations
	Analysis of regional material and energy flows (e.g. critical materials) Identification of main providers and receivers (sectors) Establish an R&D network Facilitate synergies, including services, infrastructure, use of cascading energy	Develop projects to accelerate circular economy principles Discourage artificial soil, promote green corridors, green surfaces Efficiency of the urban metabolism; Network of projects in an urban environment (e.g. Horizon 2020, LIFE, FCT); Promote interaction between actors to multiply and/or transfer knowledge and dissemination.	Develop and offer tools to promote open-access material efficiency Promote material auditing to identify efficiency and productivity opportunities Sharing of good practices, “pioneers” network, participation in international networks Develop methodologies to introduce circularity indicators into businesses
	Identification of industrial symbiosis networks in the regions: synergies underway and development potential	**Establishment of a network of solutions, practices and knowledge in the circular economy in the urban context**	**Support to identify circular economy opportunities in businesses and good practices network**

Responsible business hubs (RBH - ZER)

GOALS	• To promote industrial symbiosis initiatives between industrial companies in the key sectors based in RBHs; • To promote the setting up of companies in RBHs; • To promote the conversion of business hosting areas into RBHs; • To contribute to drawing up Circular Economy Road Maps in industrial clusters; • To contribute to drawing up Regional Industrial Symbiosis Plans
KEY SECTORS	• Transversal (companies interested in co-location); • Existing RBH management bodies interested in development; • Industrial park management bodies;
ROLES OR ENTITIES TO BE INVOLVED	• State agency for business: RBH licensing body and promoter of industrial symbioses in industrial sectors and companies; • Industrial park management bodies: boost internal symbioses between companies located in the RBHs; identify and implement measures for rational resource use; promote accredited certification leading to the circular economy (e.g. ISO, EMAS, etc.). • State agency for economic activities, business: boost environmental awareness and education actions; contribute to drawing up circular economy agendas and/or regional industrial symbiosis; • Industry and business associations: identify and disseminate business opportunities in the context of industrial symbiosis in business cooperation networks; support the framing and drawing up of applications in existing financial measures; training and qualifying of RBH technicians (in partnership with IAPMEI). • Municipalities/municipality associations: collaboration to develop local actions; • Other entities involved (public bodies, business associations, technology infrastructures, etc.): to be specified at a timely date.
GUIDELINES	• Action to inform and raise awareness within business of the theme of the circular economy and industrial symbioses; • Survey of the opportunities for industrial symbioses between businesses based in and/or moving to RBHs and other business hosting areas; • Compilation of examples of good practices in industrial symbioses in the EU and international context and holding of events with relevant external entities; • Identification of barriers to realising industrial symbioses in RBHs and their elimination, including the possible adaptation of relevant legislation; • Training of qualified staff to boost the processes of symbiosis in RBHs; • Contribution to drawing up “Circular Economy Road Maps” for industrial/business hosting area clusters and the drawing up of regional agendas; • Dissemination of the outcomes.

Responsible business hubs (RBH - ZER)

LEVEL OF PROGRESS	-
SDG/EU/PT	• SDGs: 8, 9,11, 12 and 17; • EU: Action Plan for the Circular Economy (innovation, waste, secondary raw materials, efficiency component).
COMPLEMENTARY INDICATORS	• No. of industrial symbioses/no. of industrial businesses set up in RBHs; • Quantity of materials and energy transacted between businesses/no. of industrial businesses in RBHs involved; • Savings in consumption (ton, kW) and corresponding economic saving associated with the efficient use of resources.
REFERENCES	• Decree Law No. 169/2012 of 1 August approving the Responsible Industry System (SIR); • National Reform Programme (PNR); • Decree Law No. 42-A/2016 of 12 August and Order No. 538-B/2017 – Environment Fund; • PT 2020 Partnership Agreement, COMPETE 2020 and Regional OPs; • EU Regulation No. 1293/2013 (LIFE Programme); • National Environmental Education Strategy. • European Commission, “Moving towards a circular economy with EMAS”. Available at: http://ec.europa.eu/environment/emas/pdf/other/report_EMAS_Circular_Economy.pdf

Calendar

[short term evolution]

TIME PERIOD	Top-down actions	Bottom-up actions
2nd half 2017	• Environment Fund call for applications: Support for the Circular Economy – Stage I (20 projects accepted); • Public consultation of the action plan; approval by Ministerial Council Resolution; • ENEA and call for applications by the Environment Fund; • Green Public Procurement Committee: situation after the 1st year;	• 66 circular economy-related applications to the Environment Fund; • 20 project implementation plans for 2018 – Stage II Calls for applications for Support for the Circular Economy; • ECO.NOMIA events: agriculture and forestry; construction; • Public consultation sessionss: APCE;
1st trimester 2018	• Appointment of the APCE Coordination Group; first meeting and plan of activities; • Environment Fund call for applications: Support for the Circular Economy (Stage II), regional transition agendas, circular economy projects in parish councils, cuts to business plastic use; • "Circular Economy Voucher" initiative • Consolidation of government instruments underway with impact on speeding up actions;	• Environment Fund applications and selection of Stage II Support for the Circular Economy; • **Environment Fund** applications to Regional Agendas, local circular economy solutions; reiventing plastics in the economy; • Green Growth Cohalition plenary; • ECO.NOMIA event;
2nd trimester2018	• EEA Grants – EEA financing mechanism (circular economy under construction); • Portugal2020 environmental network; • Regulation on "Circular Agreements";	• Mobilisation of local actors;
3rd trimester 2018	• Monitoring protocol for the circular economy; • EIB proposal – circular economy; • Consolidation of the ECO.NOMIA portal as the one-stop-shop information source;	• 1st Circular Agreement; • Mobilisation of local actors; ECO.NOMIA event;
2019	• APCE assessment; • EIB proposal – circular economy; • Environment Fund call for applications: Circular Economy;	• **Green Growth Cohalition plenary;** • Environment Fund applications; • Mobilisation of local and sectoral events; ECO.NOMIA events
2020	• APCE assessment, review and adjustments to actions for 2025;	

The calendar is indicative but not exhaustive, as it is subject to the separate scheduling associated with the various instruments mentioned (e.g. ENEA, ENCDA), as well as the scheduling of the guidelines to be set out by the Coordination Group. It is also subject to the calendar of actions drawn up by the EU under its action plan.

Given this, guidelines have been selected which, from the point of view of the governance model and instruments developed by the Ministry for Environment in this matter, are already planned. This timeline will be further developed in connection with the areas of government involved in pursuing this plan, consolidating joint action in this matter.

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