

## INNOVATION FOR A CIRCULAR ECONOMY IN EUROPE

### DECLARATION

We, the Presidents of COTECH Italy, COTECH Portugal, and COTECH Spain, meeting in Madrid on February 10<sup>th</sup>, 2017, during the XI COTECH Europa Meeting, recognize:

- The circular economy is a source of competitiveness and economic growth while safeguarding environmental goals;
- Strategies for innovation in business models require adequate policies for supporting private R&D and technology adoption;
- Southern economies have very good examples of circular innovation;
- Circular economy is also a priority in public policy in COTECH countries;
- Science and technology systems in COTECH countries have the capacity to support development of R&D solutions to business problems;

COTECH organisations express their willingness to have a stronger and common voice and representation to actively contribute to the improvement of public policies aimed at promoting transition towards a more circular European economy.

Therefore, we encourage taking action in the following areas in order to accelerate the transition towards a circular economy:

- **Education & Culture**

The transition to a circular economy cannot be achieved without profound change, not only in production systems, but also in consumption patterns. It is essential to introduce, from the earliest stages of the educational system, elements for environmental training and responsible consumption in the framework of a widespread growth of a Circularity Culture, and in the short term to develop professional profiles with the technical and managerial capacities that support the development of circular business models.

- **Innovation to face challenges**

The magnitude and scope of the change to a circular economy require the adoption of a broad concept of innovation in both public and business policies. In order to address the outstanding challenges in all phases of the cycle, it will be necessary to support the generation of knowledge in all fields – including the social sciences; to promote its application in the development of new technologies, and to apply existing technologies in new business models and in new areas.

- **Fiscal incentives & innovative public procurement**

The design of public policies will be critical to accelerate the transition. In this regard fiscal incentives can drive adoption of circular patterns in firms and changes in consumer habits. Green public procurement and public procurement of innovation are powerful tools to promote product development taking into account their entire life cycle as well as the potential for reuse and recycling of these products.

- **Smart regulation**

In order to remove barriers in the transitions towards a circular economy, it is essential to have a coherent and harmonized set of rules for the management of resources and waste, which integrates the different territorial levels: European, national, regional and local.

- **Metrics, evaluation**

Decision-making at all levels should be supported by comprehensive and verified information, so it is urgent to develop an integrated system of indicators for the analysis and monitoring of progress in the transition to the circular economy. This system of indicators will have to be supported by a system of data collection and harmonized statistical development that allows monitoring and comparison between regions and countries.

- **Public/Private Financing tools**

It is necessary to create innovative models of public-private financing mechanisms for initiatives and projects that contribute to the advancement of the circular economy. More than this, banks and financial institutions can play a critical role in promoting Circular Economy by the redesign of traditional instruments for financing investments of firms targeted to the implementation of Circularity of products and process.

- **Reindustrialization of Europe**

Reindustrialization of Europe is critically geared on Circularity, which has to integrate other growing industrial models, such as Cottage/Urban Industry, Peripheral Actors Manufacturing, and Maker Economy. It has also to be built on the new production paradigm “From Nano to Macro”, following the integration “ICT-Bio-Nano”.

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## 1. Need for action

Many question what the circular economy is precisely and whether it is a persistent trend or a well-intended hype. Our view is that the European Systems of production and consumption need a fundamental transformation to achieve the EU 2050 vision of “Living well within the limits of our planet”<sup>1</sup>.

European economies are in a state of high dependence of a continuous flow of natural resources and materials, whose biggest proportion is provided mainly through imports. Increasingly, this dependence is a source of vulnerability, as it intensifies global competition for natural resources with consequences on market increases in price levels and volatility. Though not considered scarce in absolute terms, many natural resources show an unevenly geographic distribution across the world, which has the potential for geopolitical conflicts<sup>2</sup>. While resource efficiency has improved in Europe in the last years, it is recognised that its burden on global ecosystems is at a considerable level<sup>3</sup>.

Accelerating the transition to more a more circular economy can contribute to address many of these challenges, improving efficiency of resource utilisation, reducing costs and risks and enhancing competitiveness. For Europe, attaining a position of leadership in the transition also opens opportunities to drive innovation in new materials and better goods and services, increasing the stock of jobs and securing first-move competitive advantages in the global economy<sup>4</sup>.

The transition to a higher level of circularity in the economy will require fundamental changes in the value chain, from product design and technology to new business models, new ways of defending and preserving natural resources, extension of product lifetimes and turning waste into resources, new modes of consumption, new norms and practices, education and finance. The circular economy is, by definition, a space of ideas, creativity, knowledge, technology and innovation. Action will be needed at all levels, from European to local, by all stakeholders – including governments, businesses, academics, citizens, among many other social players. Integration between different policy levels and policy domains will also be key to achieve the stated goals.

## 2. The COTEC countries' situation

The three COTEC countries show eco-innovation performance above EU average<sup>5</sup>. In terms of resource productivity, the leading indicator considered in the EU resource efficiency scoreboard, COTEC countries perform, in average, above EU levels, displaying a quite favourable evolution in the last 15 years.

## 3. Seizing the Circular advantage

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<sup>1</sup> EU, Decision 1386/13/EU European Parliament and of the Council, 2013

<sup>2</sup> EEA, The European Environment state and outlook - Assessment of global megatrends, 2015

<sup>3</sup> EEA The European environment - state and outlook, synthesis report, 2015

<sup>4</sup> EMF, Towards the circular economy – economic and business rationale for an accelerated transition, V1, 2012; Accenture, The Circular Advantage 2014

<sup>5</sup> Composite Eco Innovation Scoreboard EU-28, Eco Innovation Observatory 2015

For decades EU's waste management policies – mainly through favouring recycling – have contributed to the development of the circular economy. The benefits of the transition to higher circularity extend to resource utilisation, environmental protection, economic development and addressing societal challenges and job creation. The transition process will necessarily require a profound level of change and implicate risks and costs that have to be taken into consideration.

A more circular economy could raise the efficiency and productivity of primary material consumption in Europe. An estimated 6-12% of all material consumption (including fossil fuels) is currently saved as a result of recycling, waste prevention and eco-design policies, while the maximum potential using the existing technology is estimated to be in the range of 10-17%<sup>6</sup>.

By using innovative technologies, European economies may improve resource efficiency along value chains, reducing material inputs in EU by up to 24% by 2030.<sup>7</sup> In food, mobility and infrastructures sectors, innovation areas are paramount and could contribute to a prospective reduction in greenhouse gas emissions of 48% by 2030 and 83% by 2050 by reference to 2012 levels<sup>8</sup>. Concerning mobility, examples are already emerging in carsharing, integrated transport inter-modality, light-weight and remanufactured cars and electrification of transport based on renewables and self-driving vehicles. For food systems, opportunities lay on the areas of regenerative resource efficient farming, nutrient close loops, and by far, reducing food waste. For infrastructures, resource efficient buildings, smart construction, sharing residential and office space are merely some of the vast array of opportunity areas to innovate.<sup>9</sup>

Achieving an absolute decoupling of economic output and social well-being from resource and energy use and from related environmental impacts is the main objective of EU resource efficiency policy<sup>10</sup>. Different combinations of more ambitious targets for recycling of municipal and packaging waste and landfill disposal reduction could represent a mitigation of greenhouse gas emissions of c. 424-617 million tonnes over 2015-2035, in accumulation to reductions from full implementation of existing targets<sup>11</sup>. In specific industries as food and beverage, food services and hospitality, well designed resource efficiency measures could avoid 100-200 million tonnes of CO<sub>2</sub>-equivalent annual emissions<sup>12</sup>. Measures aimed at achieving longer material loops would contribute

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<sup>6</sup> EC, Commission Staff working paper – analysis associated with the roadmap to a resource efficient Europe, 2011

<sup>7</sup> Meyer B, Macroeconomic modelling of sustainable development and the links between the economy and the environment, 2011

<sup>8</sup> EMF and McKinsey center for Business and Environment 2015

<sup>9</sup> EMF and McKinsey center for business and environment 2015

<sup>10</sup> EU Decision 1386/2013, of European Parliament and the Council, 2013

<sup>11</sup> EC, Commission staff working document, additional analysis to complement the impact assessment SWD(2014) 208, 2015

<sup>12</sup> AMEC, Opportunities to business of improving resource efficiency, final report, 2014

to enhance ecosystem resilience and mitigate environmental impact of mining primary raw materials.

Transformation of the 'extract-make-consume-dispose' linear economic organisation by adoption of circular thinking approach will alleviate the pressure on environment and human health, while could create many opportunities for increasing the competitiveness and growth of European businesses, especially the SMEs.

Using technologies and business model innovation, a circular economy paradigm could underpin new approaches to create more economic value while mitigate natural resources demand. For resource intensive industries, circular innovation may represent significant cost savings. Implementation of circular concepts in manufacturing of durable goods with medium lifespans may result in net material cost savings of 12-23% of current material input costs in these industries<sup>13</sup>. In consumer goods – food, beverages, textile and packaging – the savings may represent 20% of the material input costs.<sup>14</sup> Implementation of resource efficiency circular models in activities as waste prevention, material recovery, procurement practices and redesign of products may represent an increase in annual turnover of 3-8%<sup>15</sup>

Social and impact innovation will also have a role to play in the transition to higher circularity in the economy. Areas of opportunity are sharing, reuse, eco-design, up-cycle and remanufacture, which are expected to result in more sustainable consumer behaviour, while raising human well-being and safety levels.

At the social level, a key challenge for EU is to address how to increase job creation. A more circular economy is expected to be a source of more job creation as is stated in the impact assessment on the legislative proposals on waste, increasing recycling targets, simplification of legislation, improved monitoring, diffusion of best practices to achieve reuse municipal targets, in combination with reduced landfill disposal. Development of fully circular value chains may generate a net creation of jobs by 2030, despite negative impact in some industries. Different circular approaches may generate different job profiles. Labour intensive strategies such as preparation and sorting of products and materials for reuse, upcycle and recycling would keep low skilled profiles; closed-loop recycling and remanufacturing are expected to generate medium-skilled jobs while bio-refining demands high skilled profiles. Product as a service (PAAS) could provide jobs for workers with all levels of education and training, providing opportunities for getting unemployed people, especially young workers, back to the market<sup>16</sup>. As a whole, impact in potential jobs – in a scenario of expansion of current development in circular transition – for Europe in 2030 is 1.2 million jobs created while reducing unemployment by 250,000 jobs. In the three COTEC countries, the same scenario points towards gross job creation

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<sup>13</sup> EMF, 2012

<sup>14</sup> EMF Towards the circular economy: opportunities for the consumer goods sector, 2013

<sup>15</sup> AMEC, 2014

<sup>16</sup> Luxembourg Government, Ministère de l'Économie, Luxembourg as a knowledge capital and testing ground for a circular economy, 2015

of 250,000 jobs<sup>17</sup>. It is worth to notice that in a transformation scenario (more aggressive measures for transition), these figures could double.

#### 4. Key enabling factors underpinning the transition

The transition for a more circular economy will require fundamental changes in many areas of a complex socio-economic system. Several crucial areas are already identified in technical, economic and social spheres. One should focus on enabling factors that guide and accelerate the transition process. There should be concurrent actionable interventions in order to create systemic positive reinforcing effects, all of which require adequate policy frameworks adaptable to specific economic realities.

New technologies (e.g. nanotech, mobile communications, IoT, renewables) are available to address the challenges of the linear economy. As a result, entrepreneurs and businesses develop new ways to organise production and usage of goods. Networks of companies and institutions involve strong elements of cooperation and co-creation allowing new types of interactions as C2C or C2B. Leveraging on information technologies, Service models could become paramount over ownership of a product (that delivers the service). New metrics are needed to measure success on the market which should include a cost-benefit analysis across life-cycle of product that incorporates financial and non-financial values for all stakeholders involved and well as for the society at large.

At EU level, the 2015 circular economy package<sup>18</sup> and EU innovation partnership on raw materials<sup>19</sup> are aimed to create enabling conditions for circular economy approaches. Regarding support to knowledge creation and innovation, the EU Horizon 2020 Research and Innovation Programme is set to invest c. 670 M euros 2016-2017 into EU industry for supporting technology and innovation projects. While praising current initiatives as signalling politic commitment to efforts to promote transition, we see room for improvement and clarification of many aspects of these policy tools in order to attain their purposes Europe-wide.

Business model innovation is a cornerstone enabler of a circular economy<sup>20</sup>, as incorporation of circular thinking concepts throughout innovative business models could have a transformational lasting effect on the economic system. However, there is plenty of evidence that, without adaptive and flexible policy frameworks, many innovative business models will not be capable to compete with existing linear incumbents or, when attaining a suitable market scale, they might lose some of their fundamental benefits.

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<sup>17</sup> P Mitchell & K James, WRAP, 2016

<sup>18</sup> EC Communication from the Commission, Closing the loop – an EU action plan for the circular economy, COM(2015) 614/2, 2015

<sup>19</sup> EC Communication from the Commission, Making raw materials available for Europe's wellbeing – proposal for a European innovation partnership on raw materials, COM(2012) 82, 2012

<sup>20</sup> See taxonomy of circular models e.g. ETC/SCP or Accenture 2014

Acting at the inception of the value chain, Eco-design is another powerful enabling factor<sup>21</sup> that is not being fully exploited, as the current economic system does not reward eco-designed products. Better policies need to be put into action to provide the necessary incentives to consumers, retailers and producers to improve circularity of products, extending lifetimes, repair, reuse, remanufacture and recycling. In this way, innovation in Reuse and Repair business models underpinned by information technologies is emerging as entrepreneurs start to look with interest to opportunities in trends concerning the rise of secondary markets and online repair communities. Examples of smart policy interventions, set in some member states, may be extended Europe-wide for stimulate development of robust reuse, repair and remanufacture markets, addressing at the same time fiscal issues concerning labour-cost barriers and low-skilled employment challenges.

Service and function based business models are focused in selling performance and functions of the product, instead of its physical ownership. These models could have several economic benefits<sup>22</sup> for businesses, such as customer loyalty, product differentiation and scale-up the value of used products leading to reduced costs and incorporate new technologies. Known for decades in business-to-business markets, these models may bring more cost transparency to consumer markets in the whole use cycle, namely total cost of ownership (maintenance, repair and replacement) by comparison with ownership-based models. Central to a complete transition to a circular economy, these models may trigger negative economic and social impacts in linear value chains, as they have lower flux requirements of raw materials required for manufacturing of new products.

Collaborative consumption, supported by smart technologies and global peer-to-peer interactions (online sharing marketplaces), is another area of growing innovation fluxes, including sharing, swapping, bartering, trading and leasing products through C2C channels to match supply and demand of goods<sup>23</sup>.

Another area of strong importance for the transition is innovation in waste-as-a-resource business models, which aims to transform waste and by-products of industrial and consumption activities into a resource. These models could be catalysts of secondary raw materials markets, as they tend to generate cross-sector and cross-cycle links. Industrial and urban symbiosis is a vast innovation space where adequate public policy should be addressed to stimulate more entrepreneurship activity. More innovation can reduce the use of energy and materials across manufacturing processes and facilitate prevention in locally clustered activities of by-products to become waste.

## 5. Finance mechanisms for circular innovation

Despite the opportunities, the transition towards a more circular economy poses many questions for the financial world and investors. Circular models pose new challenges from

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<sup>21</sup> M Braungart & W McDonough Cradle to Cradle, 2008

<sup>22</sup> EMF, 2013

<sup>23</sup> Botsman R and Rogers R, What's mine is yours: the rise of collaborative consumption, 2010

the financial perspective that, to be addressed, require adaptive mechanisms for coping with conflicting effects. While Circular models often require multiple forms of capital, cash flow optimisation and value creation in secondary markets can increase financeability. Legal contracts are pivotal in financing circular businesses and creditworthiness deserves more attention. Other important implications for financing are that design for disassembly may increase the residual value of products and supply chain finance could unlock untapped financial resources in the supply chain<sup>24</sup>. The finance of innovative business models requires gaining insight and collaboration from financial actors – banks, professional investors – together with well-designed economic and fiscal policy instruments. Public-private collaboration will be key for achieving early success cases that could provide confidence and expertise, propelling this way the transition.

## 6. Innovation in Policy

Most of the above mentioned business model circular innovation presents a highly disruptive level by nature as it implies a high level of system change. This disruptive nature may affect existing order of markets, creating unfair and negative effects that may hinder healthy market competition and impact on expectations of businesses and workers, for example, avoidance of existing taxes or regulations (safety and others). Therefore, existing policy frameworks must be kept in pace with changing technological, economic and social climates.

It is well known that disruptive innovation, praised by many for their renewal effects in the economy, may concomitantly generate social turmoil, degradation of social trust and halt acceptance of change. We are keen to strengthen cooperation with EU policy-making institutions for developing new policy solutions that tackle these challenges by mitigating potentially negative social consequences of innovation while valuating their positive economic and ecological results.

## 7. Monitoring progress of the transition

In the past, EU has developed a great deal of work in the field of innovation metrics. Despite the efforts for setting up scoreboards with arrays of efficiency and eco-innovation indicators, we recognise that there is a lack of generally accepted way to measure how effective is the transition to a more circular economy, at the levels of the continent, country or businesses. There is a need of holistic, reliable, monitoring tools for supporting this process. We want to contribute for the development of such a tool for measuring and benchmarking the level of circular maturity, helping this way to facilitate policy development, measure policy effectiveness and establish sound policy targets and consequently, improve general confidence and business investment decisions. Bearing in mind the complexity of the phenomena to be represented, this monitoring framework should be dynamic, flexible and adaptive, focussing on relevant areas as transition evolves.

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<sup>24</sup> ING, rethinking finance in a circular economy, 2015



