THE TCBL POLICY EVIRONMENT

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INTRODUCTION

In this information booklet the focus of our analysis will shift to the policy environment in which TCBL operates. The overall aim of this activity is to gain a deep understanding of how policy actions in different domains and taken at different administrative levels may affect the sustainability potential of the TCBL innovation ecosystem either through the generation of opportunities or a limitation in the scope of action. The rationale behind such activity may be found in the dependence of innovation on a large number of systemic factors, including the incentives and obstacles set by existing regulatory frameworks. As stated in the conclusions of a recent CEPS study[1]:

> EU regulation matters at all stages of the innovation process from R&D to commercialisation. Individuals, firms and governments, when deciding on whether to engage with innovation, incorporate in their decisions general rules that shape the business environment, rules affecting market size (including, critically, also free movement, directly from the treaty), innovation-specific rules, but also sectoral rules and even rules that affect the later stages of the innovation process, e.g. rules on consumer protection'.

More specifically, the objective of this first version of the deliverable is to set the boundaries of the policy domains that have been identified as relevant for the survival of the TCBL ecosystem at its current stage of development. As a matter of fact, the ecosystem of actors created by TCBL represents a living entity that is expected to expand, change and mature in the course of the project and beyond.

TCBL aspires to become a reference innovation ecosystem promoting a profound and long lasting change in the European textile and clothing industry. The key feature that characterizes its approach is the concurrent and combined presence of technological, business model and social innovation aimed at generating an inclusive and sustainable socio-economic system.

For what concerns the ability of the ecosystem to expand and thrive beyond the possibilities offered by the EU grant, two core aspects have been identified as critical:

1. The survival of existing Business Labs combined with the birth of new ones in Member States not currently represented by the consortium;
2. The market fit of TCBL-enabled innovations: in other words, their appeal for a wide audience of final consumers.

The following analysis will thus look at the policy environment from the two perspectives above. The first one will allow to understand if TBCL labs - that are often virtuous examples of public-private partnerships - may find a conducive environment in the years to come and across different European regions; the second one, instead, will permit to ponder the extent to which public regulations are working for the creation of a system of incentives in the business world and for the birth of new sensitivities among final customers that are in line with the values of sustainability, ethics and inclusion promoted by the TCBL ecosystem.

The remainder of the Section will first present a brief description of the salient aspects of the key policy environment and, subsequently, offer some reflections on their relationship with the TCBL ecosystem.

[1] J. Pelkmans & A. Renda (2014). Does EU regulation hinder or stimulate innovation? CEPS Special Report No. 96, November 2014.
https://www.ceps.eu/system/files/No%2096%20EU%20Legislation%20and%20Innovation.pdf

1 TCBL POLICY ENVIRONMENT OVERVIEW

EUROPE 2020

The European Union has been working hard to move beyond the crisis and create the conditions for a more competitive economy with higher employment. The Europe 2020 plan, which depicts the European Union's ten-year growth strategy, is about more than just overcoming the crisis. It aims at creating the conditions for a different type of socioeconomic development that is smarter, more sustainable and more inclusive.

The strategy sets five key targets for: (1) employment; (2) education; (3) research and innovation; (4) social inclusion and poverty reduction; and (5) and climate/energy[2], that the EU should meet by the end of the decade.

To ensure that the Europe 2020 strategy delivers, a strong and effective system of economic governance has been set up to coordinate policy actions between the EU and national levels. The Europe 2020 Strategy has identified new drivers to boost growth and jobs in seven specific areas, for which measures have been embedded in seven flagship initiatives, which aim to make the EU economy more efficient (a resource-efficient Europe, an industrial policy for the globalisation era), foster innovation (a Digital Agenda for Europe, Innovation Union) and fight unemployment and exclusion (Youth on the Move, an Agenda for New Skills and Jobs, European Platform against Poverty).

The seven flagship initiatives are the first and most important initiatives since their purpose is the direct implementation of the Commission's long-term strategy to secure smart, sustainable and inclusive growth. Below each of the initiative is briefly summarised.

RESOURCE-EFFICIENT EUROPE

The Resource-Efficient Europe flagship initiative, which supports the shift towards a resource-efficient and low-carbon economy, provides a long-term framework for embedding the smarter use of resources as a principle in the design of economic and social policies. A major societal challenge is the transformation of the European energy system into an almost CO2-emission free economy (-80/-95 %), which the EU aims to achieve by 2050. A 20% improvement in energy efficiency is one of the ambitious energy and climate change objectives for 2020. Bringing about this profound change involves making energy policy an integral part of other policies and establishing new planning and management approaches in order to harvest the full potential of innovative energy concepts.

This objective is framed into a long-term policy framework up to 2050, which includes four major roadmaps (moving to a competitive low-carbon economy, a Single European transport area and a resource-efficient transport system, and the energy and resource-efficient Europe roadmaps)[3] and a shorter term policy framework for climate and energy related to the period from 2020 to 2030[4].

From a TCBL perspective, an interesting aspect in the implementation of this flagship initiative is its reliance on the cooperation of stakeholders, starting with consumers and the ongoing efforts made to design proper indicators to monitor improvements in the use of resources in a manner that can drive policy developments.

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[2] European Commission (2011). Europe 2020 Targets. http://ec.europa.eu/europe2020/targets/eu-targets/index_en.htm

[3] COM(2011) 112,144, 885, 571, 244. See bibliography for full reference.

[4] COM(2014)15. See bibliography for full reference.

An Industrial Policy for the Globalisation Era

This initiative seeks to fight the inefficiencies in European and national policymaking that have made it difficult for industry, innovators, workers and consumers to fully exploit the benefits that an international economy can generate.

The 70 actions implemented as a result of this initiative include a number that are oriented towards the support of SMEs in terms of access to finance and internationalisation, as well as standard setting, streamlining legislation.

In addition, the Industrial Policy flagship initiative emphasises workplace innovation, which is an integral part of the broader concept of social innovation that TCBL labs may contribute to promote and on design as a source of innovation.

The Digital Agenda for Europe

The Digital Agenda for Europe (DAE) aims to develop innovative solutions that challenge traditional ways of doing things, like moving from closed innovation models to open and collaborative innovation that allows to tap on the power of social production and collective intelligence. This distribution of power is at the heart of the 'empowerment' element that drives the type of innovation that TCBL aspires to enable.

The predecessor to the digital agenda had been structured around developing technology and framing legislation but in 2010 the time had come to concentrate on using the latest digital technologies to address the mainstream challenges of demographic ageing and global competition in order to unleash digital potential and spread the digital culture across the EU.

The digital agenda highlights the importance of providing a better equipped (infrastructure), more secure (regulatory environment, protection of property) and knowledge-based (digital skills and jobs) digital environment. It also manages to give the digital economy the necessary political attention. It gave rise to the cooperation and commitment of various Commission services around a common agenda and contributed to a collaborative approach in order to address challenges in a participatory way. In such a context, social innovation complements traditional technological innovation methods and is one of the three main dimensions of emerging forms of innovation, together with technological innovation and business model innovation. These are three distinctive ingredients of the TCBL holistic approach to innovation, that to be properly implemented requires the presence of a technological and human capital infrastructure, that is: connections and skills, which the implementation of the digital agenda at local level is contributing to make available.

Innovation Union

This flagship initiative is probably the most explicit advocate for TCBL-like innovation[5]. It is a comprehensive package of actions aimed at achieving an innovation-friendly environment within the EU. Innovation is taken in its widest meaning: *'our future standard of living depends on our ability to drive innovation in products, services, business and social processes and models'*. The Innovation Union flagship initiative aims at tackling unfavourable framework conditions such as: low availability of private investment in research and innovation, ideas prevented from reaching the market by poor availability of finance, costly patenting, market fragmentation, outdated

[5] Europe 2020 Flagship Initiative Innovation Union, SEC(2010) http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=COM:2010:0546:FIN:EN:PDF

regulations and procedures, slow standard-setting and the failure to use public procurement strategically. Moreover, barriers in the single market make it more difficult for different players to work together across borders, using and sharing knowledge from all sources, which is increasingly how successful innovations are developed.

In addition, the initiative attempts to single out a Europe specific approach to innovation characterized by:

- A focus on innovations that address the major societal challenges. Innovation must become a key element in EU policies and the EU must use the strong potential of the public sector in areas such as energy and water, health, public transport and education, to bring new solutions to the market.
- Pursuing a broad concept of innovation, both research-driven innovation and innovation in business models, design, branding and services that add value for users and where Europe has unique talents. The creativity and diversity of our people and the strength of European creative industries, offer huge potential for new growth and jobs through innovation, especially for SMEs
- Involving all actors and all regions in the innovation cycle: not only major companies but also SMEs in all sectors, including the public sector, the social economy and citizens themselves ('social innovation'); not only a few high-tech areas, but all regions in Europe and every Member State, each focusing on its own strengths ("smart specialisation") with Europe, Member States and regions acting in partnership.

YOUTH ON THE MOVE

This initiative was designed as a comprehensive package of policy measures on education and employment for young people in Europe. It aims to improve young people's education and employability, to reduce high youth unemployment and to increase the youth-employment rate. This initiative is focused on the Europe 2020 objectives of reducing early school leaving and achieving a 75 % employment rate for the working-age population (20-64 years). It has adopted an all-encompassing approach by bringing together the issues of education and employment and creating bridges between these issues and the stakeholders.

This initiative, through its focus on young people, has brought together a set of EU actions which have put youth issues and concerns high on the European and National agendas. The four pillars of the initiative are: reduce early school leaving, modernise higher education, encourage mobility (through the European Skills passport or the 'your first EURES job' scheme) and encourage youth employment (through youth guarantees[6]).

Young people's needs and their participation in the design of measures have been a primary focus to make education and training more relevant to them; to encourage more of them to take advantage of EU grants to study or train in another country; to encourage countries to simplify the transition from education to work and to offer concrete support and helping education and employment systems in Member States to learn from each other. Universities have been encouraged to improve the quality of the courses they offer by making them more responsive to student's needs; opportunities to learn later in life and early school leavers have focused a lot of

[6] Youth guarantees ensure that all young people under the age of 25 receive good quality employment opportunities, continued education, apprenticeship or a traineeship within a period of four months of becoming unemployed or leaving formal education.

attention and youth unemployment is also being tackled through more workplace and entrepreneurial learning experiences and more possibilities for self-employment.

Considering the very high level of youth unemployment as a consequence of the crisis, actions for youth have been given extensive political and financial attention, reinforcing the means of action of this flagship initiative. The attraction of young people to meaningful employment makes a case for developing a sustainable framework for social enterprises and social innovation initiatives. Moreover, youth creativity is now seen as a crucial source of competitiveness in the fastest growing innovative sector of the global economy.

The Agenda for New Skills and Jobs

This flagship initiative's main objective is to help the EU reach its employment target for 2020 of having 75 % of working-age women and men (aged 20-64) in employment.

The agenda also contributes to achieving the EU's targets to get the early school-leaving rate below 10 % and more young people in higher education or equivalent vocational education (at least 40 %), as well as to have at least 20 million fewer people in or at risk of poverty and social exclusion by 2020. The agenda presents a set of concrete actions to step up reforms to improve flexibility and security in the labour market, to equip people with the right skills for the jobs of today and tomorrow, to improve the quality of jobs and ensure better working conditions and improve the conditions for job creation.

It is important to point out that instruments that are designed to improve education and training systems also indirectly contribute to wider social innovation. This aspect has been developed in the Communication Rethinking Education - Investing in skills for better socio-economic outcomes, adopted in November 2012, which looks at areas such as: learner-centred models involving personalised and interdisciplinary learning, soft-skills and platforms for knowledge, especially in ICT, Massive Open Online Courses (MOOCs), cloud schools or Open Educational Resources (OER). In this context, two recent studies will also provide further insights: Innovation in Higher Education (November 2013) and Measuring the impact of university-business cooperation.

The Council Recommendation on the validation of non-formal and informal learning[7] also makes an essential contribution to the Europe 2020 Strategy goals by increasing the opportunities for skills acquired outside formal education and training systems to be recognised and validated, and for establishing national systems for the validation of non-formal and informal learning.

The European Platform against Poverty and Social Exclusion

The most important objective of this flagship initiative is to help Member States to ensure economic, social and territorial cohesion. The European objective agreed for 2020 is to get 20 million people out of poverty via an integrated approach that involves economic, fiscal, social and Single Market policies. Innovation is seen as a tool that can reveal and address some of the new causes of poverty, help to establish the dignity of people experiencing poverty by recognising their specific expertise and facilitate a partnership approach between stakeholders (civil society, social partners, Member States).

This flagship initiative identified commitments for the Commission in five areas:

[7] European Council (2012). Council Recommendation of 20 December 2012 on the validation of non-formal and informal learning. (OJ C 398). http://eur-lex.europa.eu/legal-content/EN/ALL/?uri=celex:32012H1222(01)

- Delivering actions across the whole policy spectrum such as the labour market, minimum income support, healthcare, education, housing and access to basic banking accounts.
- Better use of EU funds to support social inclusion. The Commission has proposed that 20% of the European Social Fund be earmarked for fighting poverty and social exclusion.
- Promoting robust evidence of what does and does not work in social policy innovations before implementing them more widely.
- Working in partnership with civil society to support more effectively the implementation of social policy reforms. The participation of people experiencing poverty is now acknowledged as a catalyst for inclusion strategies.
- Enhanced policy coordination among EU countries has been established through the use of the open method of coordination for social protection and social inclusion (Social OMC) and the Social Protection Committee in particular.

TEXTILE REGULATION (EU) N. 1007/2011

The need to align legislation on textile names in Member States was recognised by the European Commission over forty years ago. This was due to the fact that differences in textile fibre names across Member States created a technical barrier to trade in the European single market and hindered consumer interests. In 1971, a Directive was adopted to harmonise the names of textile products and their labelling on the items themselves and in marketing documents.

The Directive was subsequently consolidated into the so-called Textile Directives: 2008/121/EC on textile names, 96/73/EC on certain methods for the quantitative analysis of binary textile fibre mixtures, and 73/44/EEC on the quantitative analysis of ternary fibre mixtures.

In 2006, the Commission decided to revise legislation on textile names again to introduce more flexibility to keep up with the technological developments expected in the industry. In 2009, the Commission adopted a proposal for a new regulation on textile names that would replace the Textile Directives.

The new Textile Regulation (EU) No 1007/2011 on textile fibre names and related labelling and marking of the fibre composition of textile products was adopted in September 2011 and became applicable on 8 May 2012. It repealed and replaced the previous Textile Directives.

The main elements are of the new directive are briefly summarised below:

- General obligation to state the full fibre composition of textile products;
- Minimum technical requirements for applications for a new fibre name;
- Requirement to indicate the presence of non-textile parts of animal origin;
- Exemption applicable to customised products made by self-employed tailors;
- Empowerment of the European Commission to adopt delegated acts amending the technical Annexes of the Regulation, in line with Article 290 of the Treaty on the Functioning of the European Union;
- Reporting on the implementation, review clause, and study on hazardous substances to be undertaken by the Commission.

In terms of scope, instead, the Regulation prescribes that textile products have to be labelled or marked whenever they are available on the market. The indication of the fibre composition of a

product is mandatory at all stages of the industrial processing and commercial distribution of that product. All products containing at least 80% by weight of textile fibres, including raw, semi-worked, worked, semi-manufactured, semi-made, and made-up products are covered by the Regulation. The Regulation does not cover size, country of origin, or wash/care labelling.

EU Ecolabel for Textile Products

The EU Ecolabel seeks to minimise the various environmental impacts at each stage of a product's life. A number of criteria have been set at levels that promote products that have a lower overall environmental impact. In particular, the criteria aim to promote textile products, which are:

- sourced from more sustainable forms of agriculture and forestry,
- manufactured using resources and energy more efficiently,
- manufactured using cleaner, less polluting processes,
- manufactured using less hazardous substances,
- designed and specified to be of high quality and durable.

These criteria have also been made available to be used on a voluntary basis by public administrations in the public procurement process. Public purchases weights between 15-20% of the EU GDP[8]. Thus making even a small improvement in terms of sustainability in such process may contribute to generate significant environmental impacts.

[8] http://ec.europa.eu/trade/policy/accessing-markets/public-procurement

2 THE POLICY ENVIRONMENT AND TCBL'S VIABILITY

The global fashion industry has a significant environmental footprint: to grow and process fibres, textiles and garments can require >20,000 litres of water per garment, while processing can require combinations of up to 8,000 sector-registered chemicals. Wearable, unsold garments are discarded into landfill at alarming rates[9].

As underlined in Section 2 of this deliverable, the textile and clothing is one of the major manufacturing industries of the EU-28 in terms of production volumes, added-value and jobs. This sector has been heavily hit by the recent crisis and has steadily lost competitiveness in the last few years. The fashion industry is characterized by highly diffused networks of small and micro firms alongside complex global supply chains of multinational brands. The former are under increasing pressure to reduce costs while the latter maintain their position as 'holders' resistant to emergent trends yet sensitive to real market shifts.

In such a scenario, the TCBL project intends to be one tile in a wider industrial policy mosaic, offering a potential new development path relying on a recipe composed of social, business model and technological innovation oriented towards triple sustainability (environmental, social, economic).

This is operationalized through the creation, or rather the elicitation, of an international ecosystem of business labs and service points collaborating with T&C enterprises of all dimensions (from home workers to large enterprises) to explore new avenues of value creation, appropriation and distribution.

Like every community, the TCBL ecosystem is characterised by a set of shared principles that are employed to select its members and guide its innovation activities towards a more desirable future. Such principles have been described extensively in other deliverables (in particular, D 6.5) and will be just briefly mentioned below as a useful reminder for the reader to better understand the reflections on the potential synergies between the TCBL core activities and the priorities set by the policy context identified.

Table 1. TCBL core principles.

	Description
Curiosity	Creative exploration of new paths, roles, social constructs and business models. Learning-driven action research as a way of life, including learning by errors and mistakes. Learning as both an individual and collective process of knowledge creation. Reframing and rethinking what exists, respect for different disciplines and methods. Trying new experiences, playfulness, randomness, having the courage to try radically new approaches.
Viability	Things should stand on their own feet, but can do so by equally increasing the prosperity of businesses and the well being of communities; this is our ultimate goal. Importance of both monetary and non-monetary transactions.

[9] WWF (1999) The Impact of Cotton on Freshwater Resources and Ecosystems

	Description
Durability	Commitment to the environment, towards circular economy and zero km. Above all, reduce consumption and a consumption-driven culture, work towards sustainable fashion. Reduce waste, design for durable relations, focus on reuse and recycling, save water, reduce emissions (atmosphere and toxic waste). Durable and resilient systems.
Multiplicity	Value of different cultures, traditions, opinions. Roles for both professionals and amateurs, different labour specialisations. Designing for diversity of needs and tastes. Allowing for multiple business models to co-exist and complement each other.
Openness	Trusting others by sharing of resources and information. Search for common processes, platforms and standards: interoperability. Participatory decision-making, using social media, connecting with others. Transparency of practices, supply chains, cost structures, etc. Sharing of new insights and information. Recognition of the contributions of all (age, gender, etc.) overcoming marginality.
Respect	Protection of privacy, authorship, and IP. Dignity of the individual, power of social knowledge. Value of place and territories. Caring for things, establishing emotional links with the clothes we wear and looking after them. Respect for those who make the things we have. Equity of business relations, payment of a Fair Price. Capacity building wherever we go.
Responsibility	Commitment to reliable, trustworthy, professional behaviour. Accountability for the consequences of our actions. Responsible design, responsible production, responsible selling, responsible consumption. Responsible choices of who we work with. Ensuring the right human and physical resources are available and good working conditions within our own organisations. Stable management and accountability.

As stated in the opening of this Section, the preliminary evidence of a potential viability beyond the grant period for the TCBL ecosystem should be looked for in the possibility for business labs to expand and survive over time as well as in the alignment of the ecosystem mission and principles with a more generalized shift of the European economy towards a more environmentally sustainable, socially inclusive and 'glocal' economic context (i.e., capable of turning local traditions as well as international trade into development opportunities). For this reason the following discussion will address the favourability of the policy environment, through a number of lenses that touch upon the different policy domains outlined above. Such lenses have been selected among the most prominent cross-industry trends currently shaping the evolution of the overall European economy: social innovation, circular economy, smart specialization and industries 4.0. In briefly discussing these four trends, we will to highlight how they relate to the T&C industry as well as to what extent they may play a positive and supportive role in fostering a long term sustainability of the TCBL ecosystem.

SOCIAL INNOVATION

Social innovations are both social in their ends and in their means. So, the social is both in the how, the process, and in the why, the social and societal goals you want to reach. The usefulness and popularity of the term social innovation is derived from the fact that it can serve

as an umbrella concept for inventing and incubating solutions to modern time challenges in a creative and positive way.

Social innovation is present in a whole range of policy initiatives of the European Commission: the European platform against poverty and social exclusion, the Innovation Union, the Social Business Initiative, the Employment and Social Investment packages, the Digital Agenda, the new industrial policy, the Innovation Partnership for Active and Healthy Ageing, and the Cohesion Policy. A very good account of how social innovation intertwines with different policy measures and domains may be found in the "Guide to Social Innovation"[10] published in 2013 by the European Commission (Directorate General Regional and Urban Policy).

In our view, the emergence of the notion of social innovation is strictly related to two long term trends. The first trend has to do with an evolution process undertaken by the private sector over the last century. It initially involved a shift from a mere focus on shareholders' interests to a wider approach based on the notion of stakeholders (any entity that may influence or may be influenced by the company core business). Subsequently it led to the birth of the so called benefit corporations[11], i.e. profit companies that include positive impact on society, workers, the community and the environment in addition to profit as its legally defined goals. More recently, it highlighted the "invisible heart of markets"[12] through the emergence of impact investment practices. The second trend has to do with the gradual shrinking of public budgets coupled with the effects of a long lasting economic crisis. The combined influence of the two phenomena contributed to a significant change characterized by a reduction of the public sector perimeter and a concurrent blurring of the boundaries between the public and the private sector[13] resulting in higher level of interaction among public agencies, enterprises and civil society under the coordination of the 'enabling state'[14].

Christian Bason, in his book on public sector innovation[15], has identified a list of actions that the public sector may put in place to become an enabler of social innovation:

- A shift from random innovation to a conscious and systematic approach to public sector renewal;
- A shift from managing human resources to building innovation capacity at all levels of government;
- A shift from running tasks and projects to orchestrating processes of co-creation, creating new solutions with people, not for them;
- And finally, a shift from administrating public organisations to courageously leading innovation across and beyond the public sector.

[10] European Commission (2013). Guide to social innovation. http://s3platform.jrc.ec.europa.eu/documents/20182/84453/Guide_to_Social_Innovation.pdf

[11] https://en.wikipedia.org/wiki/Benefit_corporation

[12] The phrase "invisible heart of the markets" has been coined by the UK G8 task force on impact investments in order to underline the roles of capital and of the market in addressing pressing societal needs without having to forego a economic return on the investment made. Further information on the topic are available in the following report: G8 Social Investment Task Force (2014) "Social Investment: The Invisible Heart of Markets".

[13] Lienert I. (2009) "Where Does the Public Sector End and the Private Sector Begin?" IMF paper

[14] Wallace, J. (2013). The rise of the enabling state. Carnegie UK Trust. http://www.carnegieuktrust.org.uk/carnegieuktrust/wp-content/uploads/sites/64/2016/02/pub14550114991.pdf

[15] Bason C. (2010) "Leading Public Sector Innovation: Co-creation for a better society" Policy Press.

As a matter of fact, social innovators can come from all walks of life and social innovation can take place in public, private and third sector organisations. Often the most fruitful sources of new ideas take place in collaborations across sectors. They can operate at the level of new ideas and pilots, of implementation and scaling, but also at the level of policymaking.

We believe that the context described above may represent a fertile soil for TCBL business labs, often resulting from unstructured or structured public-private collaborations (e.g. the Prato Lab). Labs constitute potentially attractive places where to test, implement or diffuse social and environmentally conscious innovations in the textile and clothing sector. An initiative such as "Made in Carcere"[16], an Italian based company employing detained women for the production of clothes accessories using scrap fabric from large corporations, may offer a good exemplification of the type of social innovation that TCBL labs could enable or a best practice started in a member state that could reach a European scale thanks to the support and the collaboration of a series of actors belonging to the TCBL ecosystem.

Circular Economy

The European socioeconomic model has been successful in creating and distributing income to people. But like the world economy, the European economy operates in a linear take-make-dispose resource model that generates significant waste.

As of 2012, in value terms, Europe lost 95 percent of the material and energy value, while material recycling and waste-based energy recovery captured only 5 percent of the original raw material value.1 Even recycling success stories like steel, PET, and paper lose 30-75 percent of the material value in the first use cycle. On average, Europe uses materials only once[17].

The circular economy ambition goes well beyond recycling as it advocates the creation of a restorative industrial system aimed at designing out waste. A study from the Ellen MacArthur Foundation[18] shows how recycling is an 'outer circle' of the circular economy, requiring more energy input than the 'inner circles' of repair, reuse and remanufacture as the goal is not just to design for better end-of-life recovery, but to minimise energy use.

The business case for a circular economy has been recently argued in an report jointly authored by McKinsey, the McArthur Foundation and SUN (Stiftungsfonds für Umweltökonomie und Nachhaltigkeit GmbH) titled "Growth Within: A Circular Economy Vision for a Competitive Europe"[19]. The analysis estimates that shifting towards circularity could add $1 trillion to the global economy by 2025 and create 100,000 new jobs within the next five years. The European Union could benefit from an annual productivity improvement of 3 percent and a 7 percent GDP growth with respect to current development scenarios.

The implementation of a circular economy paradigm could qualify as the next major European political economy project that could generate great benefits for the environment and boost competitiveness and resilience of the European socio-economic system.

[16] http://www.madeincarcere.it/

[17] This material value retention ratio is defined as the estimated material and energy output of the European waste management and recycling sector, divided by the output of the raw material sector (adjusted for net primary resource imports and 30 percent embedded resource value in net imported products).

[18] https://www.ellenmacarthurfoundation.org/circular-economy/interactive-diagram

[19] https://www.ellenmacarthurfoundation.org/publications/growth-within-a-circular-economy-vision-for-a-competitive-europe

At the end of 2015 the European Commission adopted a circular economy package that defines an action plan with measures covering the whole cycle: from production and consumption to waste management and the market for secondary raw materials. Also the Resource Efficient Europe flagship and the Eco-label initiative work in the direction of sustainability and resource efficiency. This transition will initially be supported financially by the European Structural & Investment Funds (ESIF), which include €5.5 billion for waste management. In addition, support will be provided by €650 million under Horizon 2020 (the EU funding programme for research and innovation) and investments in the circular economy at national level. This package surely represents an important first step nevertheless a successful outcome will require focus, endurance, smartness and financial commitment for many years to come by European institutions at all administrative levels.

As a matter of fact, the relationship consumers currently have with products and services they purchase could undergo a paradigm shift under a circular economy. What if they did not buy the goods they use, but instead favoured access and performance over ownership? The 'pay per use' contractual agreements associated with smartphones for example could be extended to standard goods such as washing machines, clothes and DIY equipment. In the textile and clothing sector companies such Mud Jeans[20] are already piloting product-as-service models, which would see us become users rather than consumers. Such a shift would not only allow companies to retain product ownership for easier repair, reuse and remanufacture, but might result in producer responsibility obligations towards sustainability.

In this respect, there are ongoing discussions regarding Extended Producer Responsibility (EPR), which implies that producers need to take greater responsibility of their products becoming resource efficient, free from dangerous substances, recyclable and reusable[21]. In France, since 2006 clothing companies have been responsible by law to ensure recycling and reuse of their products. The companies can fulfil the requirements either by self-organized programs approved by French authorities, or by contributing financially to organizations accredited by the authorities. Since the implementation of mandatory EPR systems in France the collection quantities have increased with 8% per year. As companies using textiles with more than 15% recycled fibres not have to contribute as much financially to the organizations providing collective systems, this EPR system is considered to promote positive upstream effects through an increased usage of recycled fibres[22].

Moving to TCBL, the principles the project adopted as guiding lights for the attainment of its ambitious goals in terms of socio-economic and environmental impact (viability, durability, responsibility and respect), are very much in line with the vision of a circular economy. In this respect a quicker and a more widespread diffusion of such paradigm across European markets would significantly contribute to increase the market fit of TCBL-enabled innovations, thus providing a robust foundation on which to base their business rationale. In addition the presence of initiatives such as the Innovation Deals[23] promoted by the European Commission may represent a fast track for systemic impact generation thanks to a quicker yet responsible opportunity to overcome potential regulatory barriers to societal transformation. Innovation Deals intend to enable innovators to swiftly address legislative obstacles, shortening the time between moment of inspiration and market uptake. They take the form of voluntary cooperation between the EU, innovators, and national, regional and local authorities and are aimed at an in-

[20] http://www.mudjeans.eu/lease-a-jeans/
[21] Augustsson Y. (2013) Textil och textilavfall– förslag till nytt etappmål i miljömålssystemet
[22] Watson D., *et al.* (2014) EPR systems and new business models. Norden.
[23] https://ec.europa.eu/research/innovation-deals/index.cfm

depth understanding and clarification of how an EU rule or regulation applies. If a rule or regulation is confirmed as an obstacle to innovations that could bring wider societal benefits, the deal will make it visible and feed into possible further action[24].

Finally, from a human capital perspective, making the transition to a circular economy will be complex as it requires a pressing need for new skills, not just within the STEM (Science, Technology, Engineering, Maths) subjects, but across the creative disciplines of: design, advertising, digital, systems thinking and business modelling. In this respect, the capacity building activities conducted by the ecosystem of design, make and place labs within TCBL will contribute to offer a complementary contribution in terms of professional education to the important education outreach work that will need to be conducted by universities and secondary schools.

SMART SPECIALISATION

The Research and Innovation Smart Specialisation Strategy (RIS3) is a refinement and upgrading of the existing methodology for Structural Funds programming. It is based on 15 years of experience in supporting innovation strategies in the regions, and on frontline economic thinking by major international institutions such as the World Bank, the OECD and the IMF. The most advanced regions have been engaging in similar strategic exercises for a long time, as highlighted by the Regions for Economic Change initiative[25] or the Regional Innovation Monitor.[26]

Smart specialisation is about identifying the unique characteristics and assets of each country and region, highlighting each region's competitive advantages, and rallying regional stakeholders and resources around an excellence-driven vision of their future. It also means strengthening regional innovation systems, maximising knowledge flows and spreading the benefits of innovation throughout the entire regional economy.

The RIS3 ex-ante conditionality requires EU Member States and regions to identify the knowledge specialisations that best fit their innovation potential, based on their assets and capabilities. They must do this through a process of 'entrepreneurial discovery', i.e. involving key innovation stakeholders and businesses. Thus, rather than being a strategy imposed from above, smart specialisation involves businesses, research centres and universities working together to identify a Member State or region's most promising areas of specialisation, but also the weaknesses that hamper innovation there[27]. The national or regional authorities are required to draft a document outlining the proposed strategy for that country or region and, in particular, the planned public and private investments including from Structural Funds in research, technology development and innovation. This strategy is not supposed to be built on and/or aim at regional scientific excellence but also support practice-based ('non-technological') innovation and include the adoption and diffusion of knowledge and innovation.

The rationale behind the need for a specialization has to be found in the shrinking pool of resources available for public budgets and at the same time the need to guarantee a higher value for money to taxpayers whose financial support may not be a solution to all problems, thus the need for careful selection.

[24] https://ec.europa.eu/research/innovation-deals/index.cfm
[25] http://europa.eu/legislation_summaries/regional_policy/review_and_future/g24240_en.htm
[26] http://www.rim-europa.eu
[27] http://ec.europa.eu/invest-in-research/monitoring/knowledge_en.htm

From a textile and clothing sector perspective, it is interesting to investigate how the smart specialisation strategy approach prompted by the European Commission has impacted on the industry presence among the selected development priorities of European regions and, as a consequence, on T&C companies' ability to leverage public investments to enhance or sustain their competitiveness.

A research conducted within TCBL and made available on the project knowledge space offers a bird's eye view on which European regions have listed the T&C sector as one of their RIS3 priorities. The analysis relied on the EYE@RIS3 visualisation tool[28] (which may not be fully updated at the time data was retrieved, mid-February 2016, however it can be considered as the single, and perhaps only, official site including enough data and information at EU level)

As the following map shows, there are currently 10 regions in Europe, belonging to 6 different countries, with an explicit RIS3 priority in favour of the T&C sector. As stated, this can either be related to the poor degree of specialisation in that sector, or to the fact that the latter is considered strong enough to survive in global competition without an explicit need for public financial support. We tend to think in these terms as the experience of e.g. Prato in Tuscany, IT or Lille in France, North Pas de Calais are notably missing.

Table 2. EU Regions with the T&C industry as a RIS3 priority.

Country Code	Region Name & Code	Keyword(s)	Country Code	Region Name & Code	Keyword(s)
DE	Berlin [DE3]	Fashion Week	**IT**	Piemonte [ITC1]	Textile, Fashion
EL	Kentriki Makedonia [EL12]	Fashion, Clothing		Valle d'Aosta / Vallée d'Aoste [ITC2]	Clothing, Equipment
ES	Galicia [ES11]	Textile, Footwear		Molise [ITF2]	Fashion
	Castilla-La Mancha [ES42]	Textile, Footwear	**PL**	Lódzkie [PL11]	Textile, Fashion
	Cataluña [ES51]	Textile, Garment, Leather, Footwear	**PT**	Norte [PT11]	Fashion

[28] http://s3platform.jrc.ec.europa.eu/eye-ris3

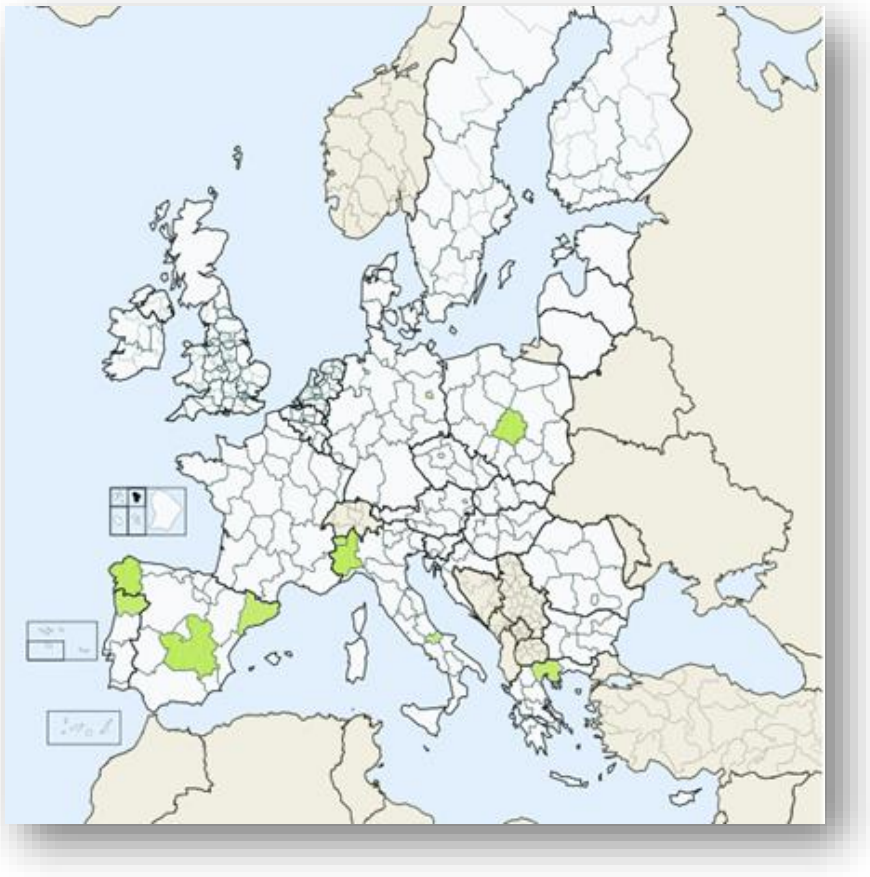


Figure 1 - EU Regions with the T&C industry as a RIS3 priority

There can be, however, another explanation for such relatively modest outcome: namely that the T&C industry priorities have been subsumed within the more encompassing (and fashionable) keywords of “design industry” or “creative industries”. In fact, if we repeat the same analysis using “design” as a search word, we now identify 19 regions (and 5 countries: Denmark, Luxembourg, Malta, Romania and Slovenia) having such RIS3 priority. Likewise, using the search word “creative”, the number ascends to 51 regions (of which: 9 from Norway, an associated country to the EU) and 7 member states (namely: Bulgaria, Denmark again, Lithuania, Poland, Portugal, and Romania and Slovenia again) with their national RIS3 priorities.

Table 3. EU Regions with “Design industry” as a RIS3 priority

Country Code	Region Name & Code	Country Code	Region Name & Code	Country Code	Region Name & Code
BE	Flemish Region [BE2]	**FR**	Centre [FR24]	**LU**	= (whole country)
DE	Niedersachsen [DE9]		Nord-Pas-de-Calais [FR30]	**MT**	= (whole country)

Country Code	Region Name & Code
DK	= (whole country)
EL	Dytiki Ellada [EL3]
ES	Cantabria [ES13]
	Comunidad de Madrid [ES30]
	Cataluña [ES51]
	Comunidad Valenciana [ES52]

Country Code	Region Name & Code
	Pays de la Loire [FR51]
	Bretagne [FR52]
IT	Piemonte [ITC1]
	Basilicata [ITF5]
	Provincia autonoma di Bolzano / Bozen [ITH1]

Country Code	Region Name & Code
PL	Lódzkie [PL11]
	Wielkopolskie [PL41]
	Opolskie [PL52]
	Warminsko-Mazurskie [PL62]
RO	= (whole country)
SE	Dalarnas län [SE312]
SI	= (whole country)

Figure 2. EU Regions with “Design industry” as a RIS3 priority

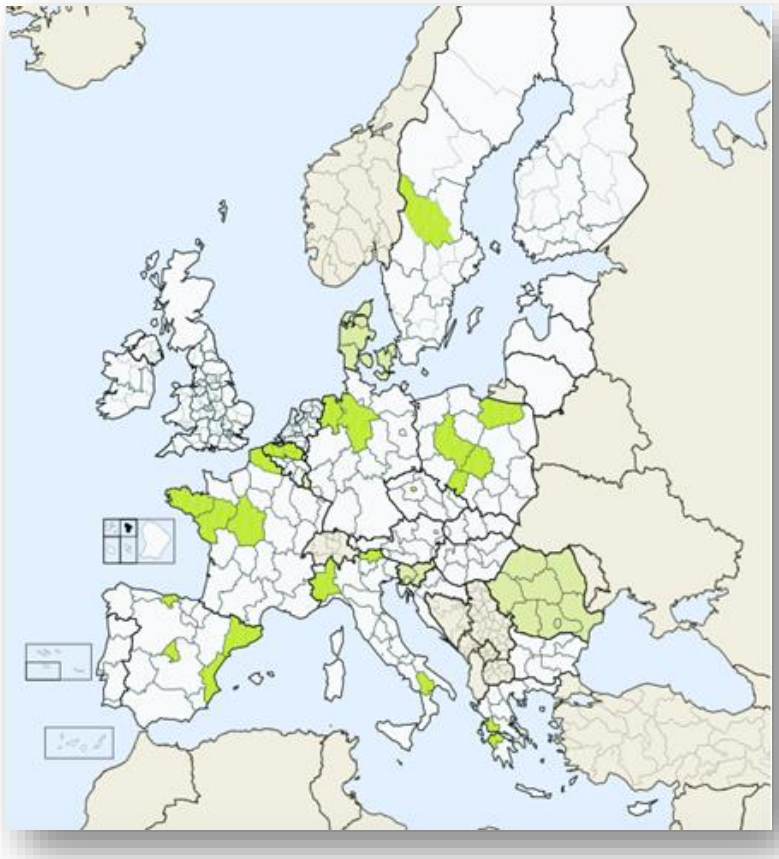
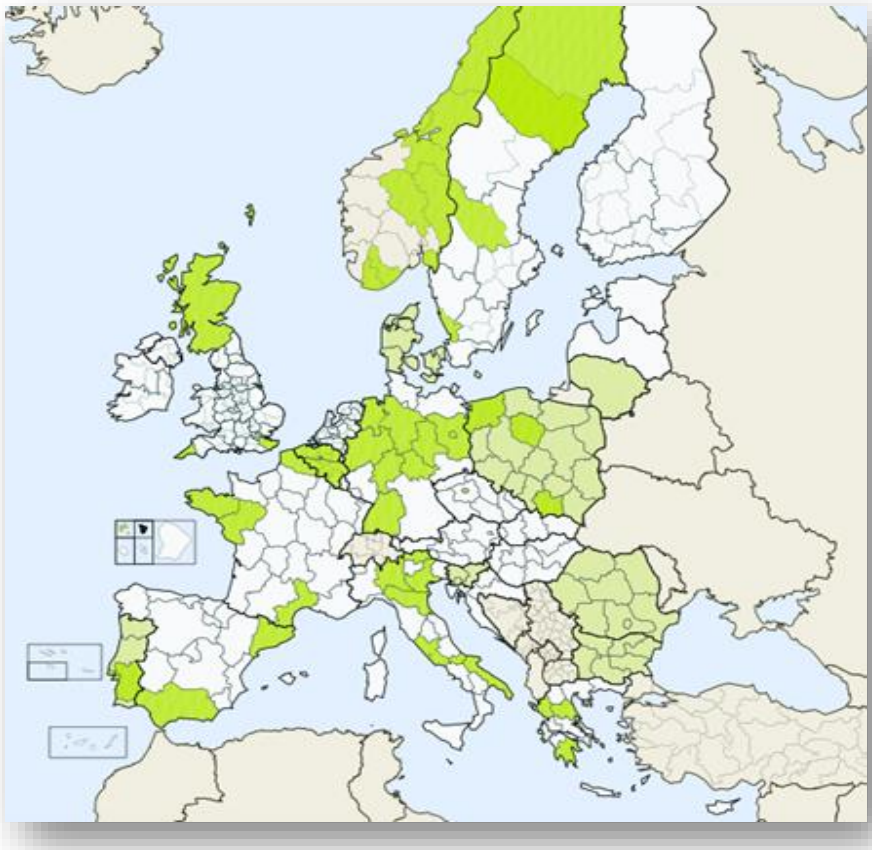


Table 4. EU Regions with “Creative industries” as a RIS3 priority.

Country Code	Region Name & Code
BE	Flemish Region [BE2]
	Walloon Region [BE3]
BG	= (whole country)
CZ	Praha [CZ01]
DE	Nordrhein-Westfalen [DEA]
	Sachsen-Anhalt [DEE]
	Thüringen [DEG]
	Baden-Württemberg [DE1]
	Berlin [DE3]
	Brandenburg [DE4]
	Bremen [DE5]
	Hessen [DE7]
	Niedersachsen [DE9]
DK	= (whole country)
EL	Thessalia [EL14]
	Ipeiros [EL21]
	Ionia Nisia [EL22]
	Peloponnisos [EL25]
FR	Nord-Pas-de-Calais [FR30]
	Pays de la Loire [FR51]
	Bretagne [FR52]
	Languedoc-Roussillon [FR81]
	Guadeloupe [FR91]
IT	Lombardia [ITC4]
	Molise [ITF2]
	Puglia [ITF4]
	Provincia autonoma di Bolzano / Bozen [ITH1]
	Veneto [ITH3]
	Emilia-Romagna [ITH5]
	Lazio [IT14]
LT	= (whole country)
NO	Hedmark [NO021]
	Oppland [NO022]
	Østfold [NO031]
	Aust-Agder [NO041]
NO	Nord-Trøndelag [NO062]
	Nordland [NO071]
	Finnmark [NO073]
PL	= (whole country)
	Malopolskie [PL21]
	Zachnodiopomorskie [PL42]
	Kujawsko-Pomorskie [PL61]
PT	= (whole country)
	Lisboa [PT17]
	Alentejo [PT18]
RO	= (whole country)
SE	Hallands län [SE231]
	Dalarnas län [SE312]
	Övre Norrland [SE33]
	Västerbottens län [SE331]
SI	= (whole country)
UK	Kent [UKJ4]
	Cornwall and Isles of Scilly [UKK3]

Country Code	Region Name & Code	Country Code	Region Name & Code	Country Code	Region Name & Code
ES	Andalucía [ES61]		Vest-Agder [NO042]		
	Cataluña [ES51]		Sør-Trøndelag [NO061]		Scotland [UKM]

Figure 3. EU Regions with “Creative industries” as a RIS3 priority.



An additional possible interpretation, applicable to other regions (especially in the Central and Eastern European Member States) in which the T&C sector failed to be recognised as a priority domain for innovation support, may be linked to the fragmented SME-dominated nature of this industry, its generally traditional image or simply by the lack of interactions between the sector’s representatives and regional authorities.

To improve this situation, EURATEX and the European Textile Technology Platform decided to facilitate a dialogue among regional authorities, industry representatives and innovation enablers to develop the best strategies to enhance textile innovation.

As a result, the RegioTex initiative was recently launched in April 2016 during the conference 'Boosting Regional Textile Innovation in Europe' held at the Committee of the Regions in Brussels. Six regions have committed to lead RegioTex at this starting stage: Catalonia (ES), Nord Pas de Calais (FR), Norte Portugal (PT), North-East Romania (RO), Valencia (ES) and West-Flanders (BE). More than ten other regions from important textile producing countries such as Italy, Germany or the UK were also involved in RegioTex creation and may formally join the initiative.

The main goals of RegioTex are to strengthen regional innovation structures and capacities and to establish effective European collaboration between regional actors. The initiative will focus on a number of key innovation themes for this industry such as advanced materials and manufacturing technologies, creativity and design-based innovation. Digitisation of supply chains and business models and sustainable business operations are the other priority topics.

From a TCBL perspective, the RIS3 policy resonates extremely well with the concept of Place Labs and the notion of a place-based approach to innovation. In fact, the attempt to seize the opportunities offered by the internationalization of trade may not be decoupled from a deep understanding and a cunning valorisation of the heritage ingrained in the culture and the industrial tradition present in the different European regions. On the one hand, this is due to the fact that path dependence plays a significant role in the management of innovation systems at city and regional level[29]. Moreover, the creation of the necessary ecosystemic conditions for an innovation to thrive (in terms of human capital, reputation, value chains, industry-specific competences, etc..) require a wide range of public and private investments that may only bear fruit over a long period of time. On the other hand, international commerce entails fiercer competition and requires the presence of strong competitive advantages that may be defendable over time. Culture-based differential value propositions may represent a significant source of competitive advantage as they rely on complex and often tacit knowledge that is very difficult to codify and hence to copy. In addition, such advantages are very much connected to well circumscribed geographical areas offering the opportunity to implement origin-based brands protection mechanisms (e.g. Made in Italy).

INDUSTRY 4.0

The European economy has lost a third of its industrial base over the past 40 years. By the third quarter of 2014, the value added by manufacturing to the economy in the EU represented only 15.3% of total value added, a decline of 1.2 percentage points since the beginning of 2008[30]. In 2012, in response to this decline in the relative importance of industry, the European Commission set a target that manufacturing should represent 20% of total value added in the EU by 2020.

Industry 4.0 is a term applied to a group of rapid transformations in the design, manufacture, operation and service of manufacturing systems and products.

[29] Marin R., Simmie J., (2008) "Path Dependence and Local Innovation Systems in City-Regions" Innovation: Management, Policy and Practice Vol. 10 Issue 2-3, pp. 183-196

[30] European Parliamentary Research Service (2015). Briefing on Industry 4.0: digitalization for productivity and growth.
http://www.europarl.europa.eu/RegData/etudes/BRIE/2015/568337/EPRS_BRI(2015)568337_EN.pdf

The term Industry 4.0 originated in Germany, but the concept largely overlaps developments that, in other European countries, may variously be labelled: Smart factories, Smart Manufacturing, the Industrial Internet of Things, Smart industry, or Advanced manufacturing.

Industry 4.0 depends on a number of new and innovative technological developments:

- The application of information and communication technology (ICT) to digitise information and integrate systems at all stages of product creation and use (including logistics and supply), both inside companies and across company boundaries;
- Cyber-physical systems that use ICTs to monitor and control physical processes and systems. These may involve embedded sensors, intelligent robots that can configure themselves to suit the immediate product to be created, or additive manufacturing (3D printing) devices;
- Network communications including wireless and internet technologies that serve to link machines, work products, systems and people, both within the manufacturing plant, and with suppliers and distributors;
- Simulation, modelling and virtualisation in the design of products and the establishment of manufacturing processes;
- Collection of vast quantities of data, and their analysis and exploitation, either immediately on the factory floor, or through big data analysis and cloud computing;
- Greater ICT-based support for human workers, including robots, augmented reality and intelligent tools.

Industry 4.0 is a very cross-sectional topic touching upon a number of the policy domains identified in the previous Section (the Resource-efficient Europe, the Innovation Union, H2020, An Industrial Policy for the Globalisation Era, etc.)

The need for investment, changing business models, data issues, legal questions of liability and intellectual property, standards, and skills mismatches are among the challenges that must be met if benefits are to be gained from new manufacturing and industrial technologies. If these obstacles can be overcome, Industry 4.0 may help to reverse the past decline in industrialisation and increase total value added from manufacturing to a targeted 20% of all value added by 2020.

However, Industry 4.0 is not only about opportunities for the economy. It may also be about opportunities for society. To begin with, Industry 4.0 could represent a potential chance to keep production jobs in developed regions such as Europe. If a shirt is manufactured by a smart machine in an automated process, it can be produced anywhere at the same costs. Companies won’t start to employ Europeans to sew. But if Industry 4.0 becomes a success, Europeans could be employed to create, maintain and modify the machines. Moreover, it must be considered that machines are not able to fully substitute the human operator in some job roles: for instance, when a decision has to be taken, the machine can help the operator to choose the right way to follow, by showing information, documentation and suggestions. This will lead to the need to create a more skilled workforce.

The digitisation of industry may also be good for the environment. With modern technologies, companies will be able to optimise their production processes in energy and resource consumption. They may be able to produce them right where clients need them, without the cost and effort of shipping. Some companies may even be able to set up 'lights out' factories where automated robots continue production without light or heat after staff has gone home. In addition, an improved planning of production will allow to avoid the generation of unsold quantities and waste.

Finally, Industry 4.0 is an opportunity to adapt the economy to a growing world population because of its flexibility and efficiency. In Europe, where society is aging, digitisation can create jobs that are not physically demanding. In this way, Industry 4.0 improves the working environment in companies and offers opportunities for older employees to contribute to the work process. The precondition is that we begin to prepare the workforce in time for their new challenges, and teach workers IT and engineering skills.

From a TCBL point of view, Industry 4.0 presents some points of contact and some significant differences with the overall project philosophy.

On the one side, TCBL is eager to exploit the opportunities offered by information and communication technologies (sensors, virtual & augmented reality, digitisation of manufacturing and supply chain, data-driven innovation, etc.) as well as by additive manufacturing. At the same time, it also treasures some of the lessons that the last two decades of innovation management have offered about the risk of placing too much faith in the ability of technology to be the silver bullet for the solution of societal problems. For this reason, TCBL places technology on the same level as other important complementary aspects having to do with design, business modelling, community management and capacity building. In addition, the vision that TBCL interprets the role of 3D manufacturing as a potential enabler of a new paradigm of distributed production rather than a tool to make production lines more flexible in large manufacturing plants.

The economic rationale of Industry 4.0 is clear and - to a certain extent - embraceable as an attempt to level up the production costs between Europe and Asia in order to bring back production related jobs to Western economies. Nevertheless, the adoption of a strategy favouring capital intensity versus labour intensity may not be fully in line with the project principles and objectives in terms of triple sustainability. Finally, although Industry 4.0 may contribute to promote some improvements in terms of environmental sustainability, it highly relies on a paradigm of low cost and fast production that requires citizens to adopt a consumption behaviour not revolving around the key sustainability principles of durability, repair and reuse. As consequence, some doubts may arise as to the ability of such paradigm - in its current interpretation - to truly face the serious and significant sustainability challenges that our world will have to face in the decades to come.

3 CONCLUDING REMARKS

To provide a synthetic overview of the analysis carried out on the favourability of the European policy context through the lenses of four cross-industry trends, a qualitative synoptic representation has been created highlighting the relationship between the macro trends and the TCBL intended impacts. As it may be noticed by looking at the spider diagram, TCBL appears to be in a favourable situation as regards its ability to exploit the presence of existing forces sustaining the type of socio-economic changes the ecosystem is trying to promote both within the demand and the offer side of the T&C industry.

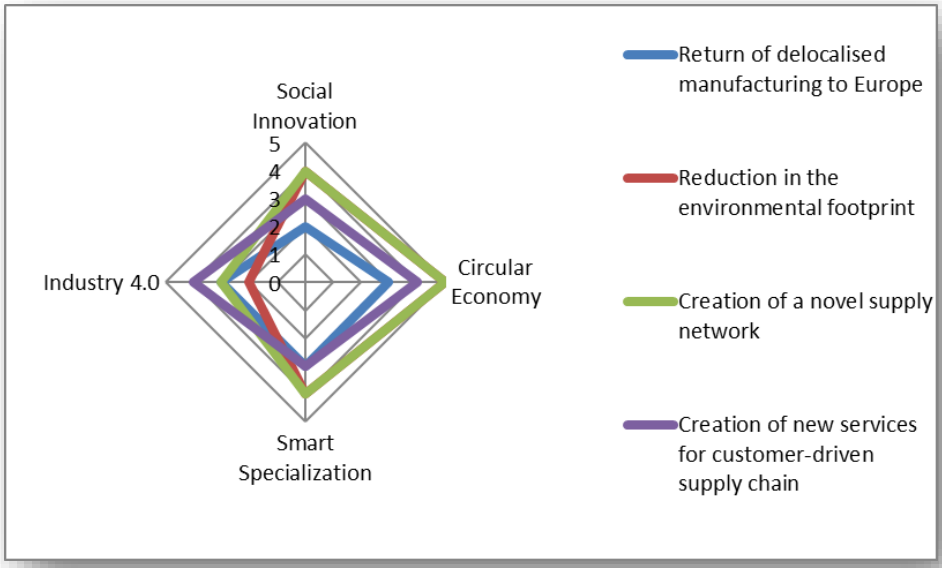


Figure 4. Macro Policy Trend Contributions to TCBL Expected Impacts.

This is probably due to the fact that TCBL is itself the result of a European policy (Europe 2020 & H2020) and, as a consequence, it embodies the policy's underlining principles (smart, inclusive and sustainable growth).

Moving to the four different macro trends, the most prominent contribution to support the project success and sustainability may be expected from the circular economy (assuming that the targets identified in the policy documents will be reached in due time). Social innovation practices and smart specialization strategies seem also to bring potential contributions in terms of creation of novel supply chains and reduction of the environmental footprint. Finally, for what concerns, Industry 4.0 there seem to be partial alignment with project objectives especially for what concerns the exploitation of technology for the creation of new services for a customer driven-supply chain.

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